7.12 NOISE

7.12.1 INTRODUCTION

7.12.1.1 Content

This section describes the noise impacts associated with the Monterey Amendment and the Settlement Agreement. Only some elements of the Monterey Amendment and the Settlement Agreement have the potential to affect noise levels. The elements with the potential to directly affect noise levels are shown in Table 7.12-1.

TABLE 7.12-1

IMPACTS OF PROPOSED PROJECT ELEMENTS ON NOISE

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Monterey Amendment		
Reallocation of water supplies in droughts	Noise associated with changes in agricultural practices	7.12-1
Permanent transfers of water	Noise associated with changes in agricultural practices	7.12-1
Transfer of Kern Fan Element lands	Noise associated with construction and operation of groundwater storage facilities in Kern Fan Element	7.12-3
Water supply management practices	Noise associated with construction and operation of groundwater storage facilities/Changes in recreational use due to fluctuations in reservoir levels	7.12-2, 7.12-4, 7.12-5
Restructured financial arrangements	NA	NA
Settlement Agreement		
Substitute Table A amount for entitlement	NA	NA
Disclosure of SWP delivery capabilities	NA	NA
Guidelines on permanent transfers	NA	NA
Guideline for public participation	NA	NA
Restrictions on Kern Fan Element lands	Noise associated with development of 490 acres of land in Kern Fan Element	7.12-3
Watershed forum in Plumas	Noise associated with development of watershed improvement projects	7.12-6
Amendment of Plumas SWP contract	NA	NA
Funding for plaintiffs	NA	NA

Note:
NA – Not Applicable.

During public review of the NOP for this EIR, interested parties submitted no comments regarding noise.

7.12.1.2 Analytical Method

The assessment of potential noise impacts was conducted in accordance with standard professional practices. Factors considered in the qualitative analysis include:

- sources of new or increased noise levels;
- the nature and magnitude of changes in noise;
- the types of sensitive land uses that would be exposed to new or increased noise levels; and
- likely reactions to changes in community noise levels.

7.12.1.3 Standards of Significance

The following standards of significance are based on Appendix G of CEQA Guidelines. For purposes of this EIR, implementation of the proposed project may have a significant adverse noise impact if it would result in any of the following:

- exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinances, or applicable standards of other agencies;
- exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The CEQA Guidelines also do not define the levels at which temporary and permanent increases in ambient noise are considered “substantial.” For the purposes of this analysis, noise impacts would be considered significant if the project resulted in the following:

- construction activities lasting more than one day that increase the ambient noise levels by 10 dBA or more at any noise-sensitive location;
- a permanent (i.e., long term operational) increase of 5 dBA Community Noise Equivalent Level (CNEL) over ambient noise levels at any noise-sensitive land use; or
- a permanent (i.e., long term operational) increase of 3 dBA CNEL over ambient noise levels at any noise-sensitive land use location where the future resulting noise level would exceed 70 dBA CNEL (i.e., the noise levels would be considered unacceptable for noise-sensitive uses by most public agencies).

The CEQA Guidelines do not define the levels at which groundborne vibration or groundborne noise is considered “excessive.” This analysis uses the Federal Railway Administration’s vibration impact thresholds for sensitive buildings, residences, and institutional land uses. These thresholds are 65 VdB at buildings where vibration would interfere with interior operations (e.g., sensitive research buildings), 80 VdB at residences and buildings where people normally sleep, and 83 VdB at institutional buildings with primarily daytime use.[1]

7.12.2 ENVIRONMENTAL SETTING

7.12.2.1 Introduction

Fundamentals of Sound and Environmental Noise

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel ("dB"). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale ("dBA") provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. Table 7.12-2 lists representative noise levels for the environment.

TABLE 7.12-2

REPRESENTATIVE ENVIRONMENTAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—110—	Rock Band
Jet Fly-over at 100 feet		
	—100—	
Gas Lawnmower at 3 feet		
	—90—	
		Food Blender at 3 feet
Diesel Truck going 50 mph at 50 feet	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	
		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

Source: California Department of Transportation, 1998.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Those that are applicable to this analysis are as follows:

- *L_{eq}*—The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- *L_{dn}*—The Day-Night Average Noise Level, is a 24-hour average L_{eq} with a 10 dBA "penalty" added to noise during the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24 hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
- *CNEL*—The Community Noise Equivalent Level, is a 24-hour average L_{eq} with a 10 dBA "penalty" added to noise during the hours of 10:00 P.M. to 7:00 A.M., and an additional 5 dBA penalty during the hours of 7:00 P.M. to 10:00 P.M. to account for noise sensitivity in the evening and nighttime. The logarithmic effect of these additions is that a 60 dBA 24 hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
- *L_{50}*—A statistical noise level, is the noise level which is exceeded 50 percent of the time during which the noise is measured.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24 hour period. Environmental noise levels are generally considered low when the L_{dn} or CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated natural settings that can provide noise levels as low as 20 dBA, and quiet suburban residential streets that can provide noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of low-moderate level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with more noisy urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA).

When evaluating changes in 24-hour community noise levels, a difference of 3 dBA is a barely-perceptible increase to most people.[2] A 5 dBA increase is readily noticeable, while a difference of 10 dBA would be perceived as a doubling of loudness.[3] Except in a carefully controlled laboratory condition, a change of 1 dBA is very difficult to perceive.

Noise levels from a particular source generally decline as distance to the receptor increases. Other factors such as the weather and reflecting or shielding also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., the area between the source and receptor is normal earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels are also generally reduced by 1 dBA for each 1,000 feet of distance due to air

absorption. Noise levels may also be reduced by intervening structures—generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 dBA with closed windows. The exterior-to-interior reduction of newer homes is generally 30 dBA or more.

Fundamentals of Environmental Groundborne Vibration

Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured as particle velocity in inches per second and in the U.S. is referenced as vibration decibels (VdB).

The background vibration velocity level in residential and educational areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, and 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.[4]

The general human response to different levels of groundborne vibration velocity levels is described in Table 7.12-3.

TABLE 7.12-3

HUMAN RESPONSE TO DIFFERENT LEVELS OF GROUNDBORNE VIBRATION

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Source: Federal Railroad Administration, 1998.

7.12.2.2 Physical Setting in 1995

Southern San Joaquin Valley Portion of Kern County

The Southern San Joaquin Valley portion of Kern County includes the communities of Arvin, Bakersfield, California City, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco. The majority of Kern County is rural, and the southern San Joaquin Valley portion of Kern County is largely devoted to agriculture. Sources of noise within the southern San Joaquin Valley portion of Kern County include, stationary equipment and operations, construction activities, and agricultural operations, although vehicular traffic is the primary source of noise throughout the area. Along with Interstate 5 (I-5), State Routes (SR) 14, 33, 41, 43, 46, 58, 65, 99, 119, 155, 166, 178, 184, 202, and 223 traverse the County. One- and two-

lane rural roads access agricultural areas, while two- and four-lane roads travel through the more urbanized areas.

Kern Fan Element

The Kern Fan Element consists of 20,546 acres of land located in Kern County southwest of Bakersfield. The Kern Fan Element lies on both sides of the Kern River but does not include the river itself, or the lands within the river levees. In 1995, there were no major structures on Kern Fan Element except for I-5, the Cross Valley Canal, and some abandoned tanks and other oil field equipment.

The Kern Fan Element was farmed for many years until the mid-1980s. After the California Department of Water Resources (Department) purchased the land in 1986, the agricultural fields were gradually taken out of production. By 1995, agriculture had ceased on the property and introduced annual grasses and forbs had colonized the land. Therefore, vehicular traffic is the primary source of noise throughout the area. The Kern Fan Element is primarily bisected by rural roads, SRs 99, 119, 166, and 223, and I-5.

7.12.2.3 Changes in Physical Setting between 1996 – 2003

Southern San Joaquin Valley portion of Kern and King Counties excluding the Kern Fan Element

There were no major changes in noise levels in the southern San Joaquin Valley portion of Kern and Kings counties (excluding the Kern Fan Element) between 1996 and 2003. Of the changes that occurred, nearly all were attributable to the gradual conversion of agricultural lands to urban uses, particularly near the city of Bakersfield, and to increased traffic on highways. These changes were not attributable to the proposed project.

Kern Fan Element

Between 1996 and 2003, noise levels in the immediate vicinity of proposed project in the Kern Fan Element increased temporarily while percolation ponds and the Kern Water Bank Canal were constructed as described above. Otherwise, ambient noise levels in the Kern Fan Element are similar to those in 1995.

Plumas County

Plumas County is located where the Sierra Nevada meets the Cascade Mountains in northeastern California. It is a rural county with no large cities. With an area of 2,554 square miles and a population of about 21,000, it has a population density of about eight people per square mile. Much of the county is within the Plumas and Lassen National Forests. Principal economic activities in the county are recreation, services and forest products. Plumas County is accessed primarily via US Highway 395 and SRs 36, 49, 70, and 89. Vehicle travel along these highways are the major source of noise in the county.

7.12.2.4 Regulatory Setting in 1995

The California Government Code requires that a noise element be included in the general plan of each county and city in the state. These noise elements serve as comprehensive programs for including noise control in the land use planning process. They are tools that county and city

planners use to ensure that sensitive land uses are not exposed to excessive noise levels, and that mitigation be identified and implemented to ensure noise-generating activities do not adversely affect such uses.

Impacts with the greatest potential to conflict with general plan noise levels are associated with the construction and operation of groundwater banks, which would occur in Kern and Kings counties only. Direct impacts of the proposed project in Riverside, Merced, Los Angeles, and Butte counties would be limited to traffic- and boating-related noise, which were determined to not result in any significant impacts that could conflict with county noise policies.

Kern County General Plan Noise Element

The major goals of the Noise Element of the Kern County General Plan are to establish reasonable standards for maximum desired noise levels in Kern County and to develop implementation programs which could effectively deal with noise.[5] Because vehicular traffic is the primary source of noise throughout the area, the noise standards and programs were prepared to address this source. The noise standards adopted by the County are identified in Table 7.12-4.

TABLE 7.12-4

KERN COUNTY GENERAL PLAN NOISE STANDARDS

Land Use Category	dBA L_{50}		dBA L_{dn} or CNEL
	Day	Night	
Insensitive Uses[1]	65	60	75
Moderately Sensitive Uses[2]	60	55	70
Sensitive Uses[3]	55	45	65
Highly Sensitive Uses[4]	50	40	60

Notes:
1. Uses that are not adversely affected by higher noise levels. These uses include agriculture, water areas, natural open space, undeveloped land, and manufacturing.
2. Included are those uses that are not adversely affected by moderate noise levels. These uses include country and athletic clubs, general commercial, restaurants, and professional offices.
3. Those uses where noise controls are necessary (without noise control the uses would be greatly disrupted. These uses include attached residences, hotels, and out-patient clinics.
4. Includes uses where any noise could be greatly disruptive (effective noise controls are very important for these uses). These uses include single-family dwellings, educational facilities, hospitals, convalescent homes, and wildlife sanctuaries.

If the noise is not smooth and continuous, one or more of the corrections below applies:

Type of Noise Operation	dBA Correction
Noise source operated less than 15 minutes of any one-hour period	+5
Noise source operated less than 5 minutes of any one-hour period	+10
Noise source operated less than 1 minute of any one-hour period	+15
Noise of impulsive character (i.e., hammering, etc.)	-5
Noise of periodic character (hum, screech, etc.)	-5

Source: Kern County, 1989.

7.12.2.5 Changes in Regulatory Setting between 1996 – 2003

Impacts with the greatest potential to conflict with general plan noise levels are associated with the construction and operation of groundwater banks, which would occur in Kern and Kings counties only. Direct impacts of the proposed project in Riverside, Merced, Los Angeles, and Butte counties would be limited to traffic- and boating-related noise, which were determined to not result in any significant impacts that could conflict with county noise policies.

Plumas County General Plan

The Noise Element of the Plumas County General Plan was prepared to ensure that the location, density, and intensity of development within both prime and moderate opportunity areas is done so as to achieve reasonable safety from noise hazards and that "noise sensitive areas" are protected.[6] The noise standards adopted by the County are identified in Figure 7.12-1.

7.12.3 IMPACTS AND MITIGATION MEASURES

7.12-1 Changes in the amount and reliability of SWP water deliveries could potentially alter agricultural practices, which could affect noise levels.

1996 — 2003

The Monterey Amendment enables various changes in the way the Department allocates water among contractors during times of shortage and surplus and enables agricultural contractors to retire and transfer a portion of their Table A amounts. The effect of these changes was to increase the reliability of water supplies but decrease the total amount of Table A water available to farmers in Kern County. The reliability and availability of agricultural water supplies is one factor that may contribute to the amount and types of crops and associated land disturbance activities.

It is possible that some land was converted to permanent crops as a result of the proposed project, and that these changes in agricultural practices could have altered the traffic volumes and use of agricultural machinery in affected areas. A doubling of traffic volumes or pieces of machinery operating at any one time would be needed to create a 3 dBA increase in roadway noise levels. The number of vehicular trips to fields with permanent crops would have likely been the same or slightly less than the number of trips to fields with annual crops and would have been unlikely to affect traffic volumes on affected rural roads. Likewise, the use of agricultural machinery would also have been the same or less. Therefore, increased noise levels associated with the proposed project would have resulted in a ***less-than-significant impact***.

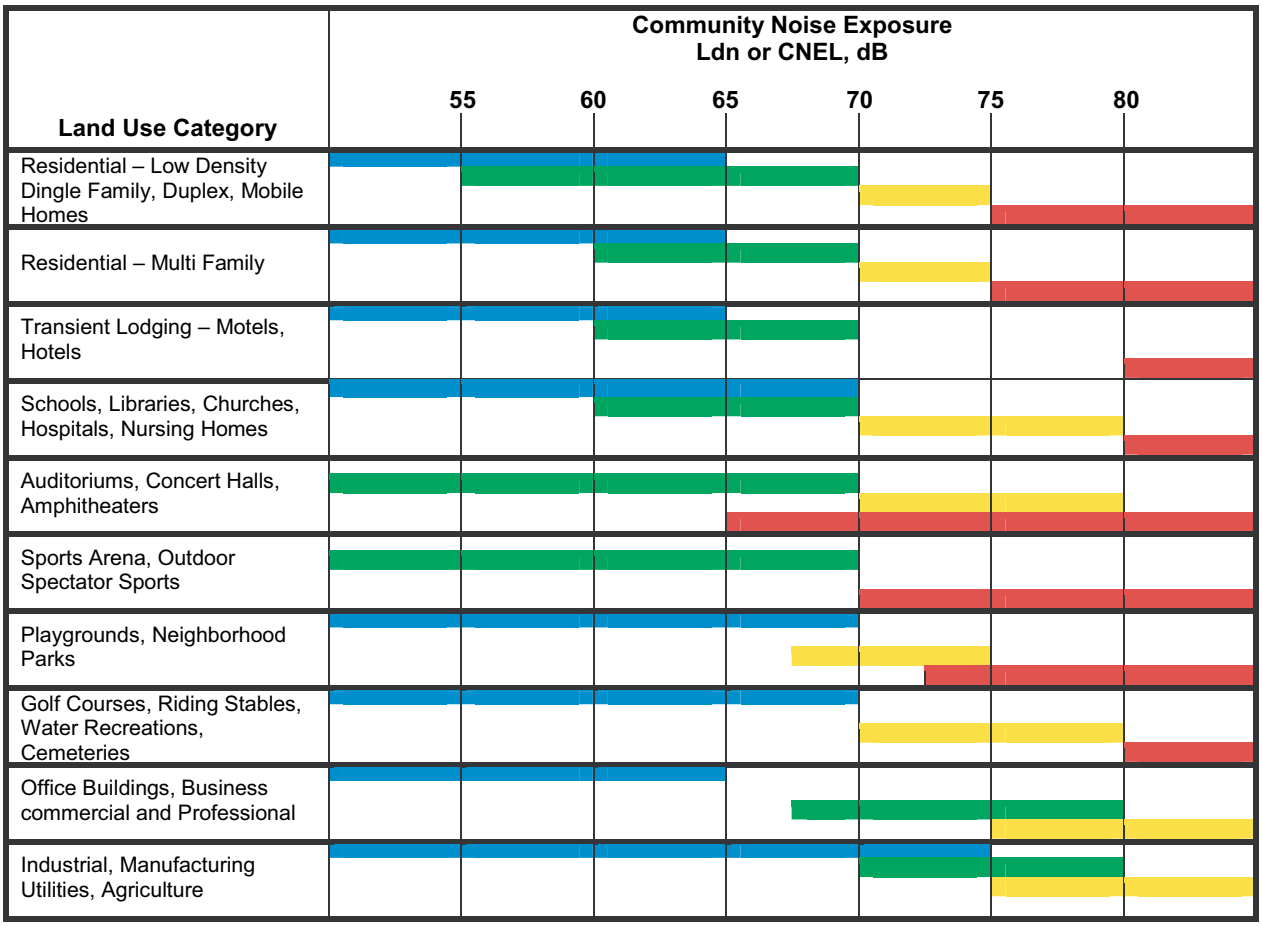
<u>Mitigation Measures</u>

None required.

Future Impacts

As discussed in Section 7.6, Agricultural Resources, the proposed project would have little or no impact on the acreage of irrigated land in the southern San Joaquin Valley in the future. Assuming that any land is taken out of irrigated production as a result of the proposed project, it would remain in agricultural use as dry farmed or fallow land. In addition, the trend of replacing irrigated annual crops with permanent crops is expected to continue in the future with or without the proposed project. While it is possible that additional land could be converted to permanent crops as a result of the proposed project, no clear trend can be attributable to the proposed project that can be discerned for the historical analysis period.

It is possible that additional land could be converted to permanent crops as a result of the proposed project, and that changes in agricultural practices could alter the traffic volumes and



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, with closed windows and fresh air supply systems or air condition will normally suffice.
	Normally Unacceptable	New construction or development should generally be discourages. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development should generally not be undertaken.

Source: Plumas County General Plan, 1998 and PBS&J, 2006.

FIGURE **7.12-1**

Land Use Compatibility for Community Noise Environments

use of agricultural machinery in affected areas. As discussed above, doubling of traffic volumes or pieces of machinery operating at any one time would be needed to create a 3 dBA increase in roadway noise levels. The number of vehicular trips to fields with permanent crops would likely be the same or slightly less than the number of trips to fields with annual crops and would be unlikely to affect traffic volumes on affected rural roads. Likewise, the use of agricultural machinery would also be the same or less. Therefore, increased noise levels associated with the proposed project would result in a ***less-than-significant impact***.

Mitigation Measures

None required.

7.12-2 Implementation of the proposed project could potentially affect noise levels in the southern San Joaquin Valley portion of Kern County (excluding the Kern Fan Element) as a result of construction and operation new groundwater storage facilities.

1996 — 2003

The Monterey Amendment enables SWP contractors to store water outside their service areas for later use within their service areas. To take advantage of this, several contractors have entered into agreements with water agencies in the southern San Joaquin Valley to temporarily store SWP water in groundwater banks. Between 1996 and 2003, Semitropic WSD, Arvin-Edison WSD and the Kern Water Bank Authority (KWBA) developed or expanded water banks. The water banking program developed by Semitropic WSD project involved the construction of a pipeline connecting the District's service area to the California Aqueduct. Arvin-Edison's water banking program involved the construction of 520 acres of percolation ponds at two sites referred to as the North Canal Spreading Works and the South Canal Spreading Works. Vacant land or cropland was converted to percolation ponds by the construction of one or two-foot high perimeter levees. Grading was required to construct the percolation ponds.

Construction of the new groundwater storage facilities required the use of heavy-duty diesel equipment such as bulldozers, graders, trucks, and drilling equipment. The U.S. EPA has compiled data regarding the noise generating characteristics of specific types of construction equipment and typical construction activities. These data are presented in Table 7.12-5 and Table 7.12-6 for a reference distance of 50 feet. These noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA measured at 50 feet from the noise source to the receptor would reduce to 78 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 72 dBA at 200 feet from the source to the receptor.

Construction activities primarily affected noise levels in the immediate vicinity of the construction sites. In the case of the proposed project, there were no sensitive uses located in close proximity to the construction sites that would be adversely impacted by daytime construction activities and noise levels. Therefore, construction noise levels did not substantially increase existing noise levels at existing land uses that are sensitive to noise.

Construction activities that occurred under the proposed project also had the potential to generate low levels of groundborne vibration. Table 7.12-7 identifies various vibration velocity levels for the types of equipment that could have been operated at the project sites during construction.

TABLE 7.12-5

NOISE RANGES OF TYPICAL CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Levels in dBA L_{eq} at 50 feet[1]
Front Loader	73–86
Trucks	82–95
Cranes (moveable)	75–88
Cranes (derrick)	86–89
Vibrator	68–82
Saws	72–82
Pneumatic Impact Equipment	83–88
Jackhammers	81–98
Pumps	68–72
Generators	71–83
Compressors	75–87
Concrete Mixers	75–88
Concrete Pumps	81–85
Back Hoe	73–95
Pile Driving (peaks)	95–107
Tractor	77–98
Scraper/Grader	80–93
Paver	85–88

Note:
1. Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.

Source: U.S. EPA 1971 as presented in City of Los Angeles, 1998.

TABLE 7.12-6

TYPICAL OUTDOOR CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Levels at 50 Feet (dBA L_{eq})	Noise Levels at 50 Feet with Mufflers (dBA L_{eq})
Ground Clearing	84	82
Excavation, Grading	89	86
Foundations	78	77
Structural	85	83
Finishing	89	86

Source: U.S. EPA 1971 as presented in City of Los Angeles, 1998.

TABLE 7.12-7

TYPICAL VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT

	PPV (in./sec.)			
Construction Equipment	25 Feet	100 Feet	200 Feet	400 Feet
Pile Driver (Impact)	0.644	0.081	0.028	0.010
Vibratory Roller	0.210	0.026	0.009	0.003
Large Bulldozer	0.089	0.011	0.004	0.001
Loaded Trucks	0.076	0.010	0.003	0.001
Jackhammer	0.035	0.004	0.002	0.001
Small Bulldozer	0.003	<0.001	<0.001	<0.001

Source: Derived from Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006, p. 12-12.

There were no sensitive uses located in close proximity to the construction sites that would be adversely impacted by daytime construction activities. Therefore, construction activities did not expose sensitive receptors to substantial vibration levels.

Operation of a groundwater bank requires pumping to convey water to percolation ponds and to extract water from underground. A representative range of noise levels for electric pumps is estimated to be 68 to 72 dBA (see Table 7.12-3) at 50 feet. If proper mufflers are provided, noise levels could be further reduced. The expansion of water banks attributable to the proposed project would result in an increase in noise emissions from pumps compared to pre-1995 conditions. However, increased noise levels would not affect sensitive receptors because the pumps are located in relatively remote areas far from homes and businesses.

When completed, vehicular movements associated with routine maintenance of the new facilities were probably the same or less than those associated with use of the land for agriculture. More pumping to convey water in and out of water banks would occur than before 1995, but the additional noise would be emitted far from sensitive receptors. Therefore, proposed project is considered to have a ***less-than-significant impact***.

Mitigation Measures

None required.

Future Impacts

As noted above, the Monterey Amendment enables SWP contractors to store water outside their service areas for later use within their service areas. Between 1996 and 2003, water banks were developed, and 520 acres of percolation ponds were constructed. It is expected that in the future, contractors would increase their use of groundwater banks. If future increased groundwater banking involved active recharge, then new percolation ponds would be built. For purposes of this analysis, it is assumed a similar amount of ponds (approximately 500 acres) would be constructed.

The conversion of land for use as percolation basins could result in construction of the percolation basins and pumping/conveyance facilities and new access roads or alteration of existing access roads, which could in turn result in temporary increase in construction-related noise levels. However, this impact would be temporary and short-term and would not be considered significant. Routine maintenance equipment and vehicles would access the new facilities and temporarily increase noise levels in the immediate vicinity of the maintenance operations. Operation of a groundwater bank requires pumping to convey water to percolation ponds and to extract water from underground. Electric motors, gasoline engines or diesel engines power the pumps. A representative range of noise levels for pumps is estimated to be 68 to 72 dBA (see Table 7.12-3) at 50 feet. If proper mufflers are provided, noise levels could be further reduced. The expansion of water banks attributable to the proposed project would result in an increase in noise emissions from pumps. However, increased noise levels would not affect sensitive receptors because the pumps are located in relatively remote areas far from homes and businesses. Further, as noted above, this increase would be intermittent and not significant. The noise impacts of new groundwater storage facilities are considered to be ***less than significant***.

Mitigation Measures

None required.

7.12-3 Noise levels in the Kern Fan Element could be potentially affected by development of groundwater storage facilities.

1996 — 2003

The Monterey Amendment calls for ownership of the Kern Fan Element to be transferred from the Department to the KCWA. This occurred in 1995. The KCWA then transferred ownership to a new agency, the KWBA. The KWBA built a groundwater storage facility, the Kern Water Bank, to take advantage of a provision of the Monterey Amendment that enables SWP contractors to store water outside their service areas.

Between 1996 and 2003, as part of the Kern Water Bank, approximately 1,665 acres of land were converted to shallow percolation ponds, a six-mile long earthen canal, the Kern Water Bank Canal, and several wells and pump stations were built. Unpaved roads were built to provide access to the new facilities. However, there were no sensitive uses located in close proximity to the construction sites that were adversely impacted by daytime construction noise and groundborne vibration levels. Routine maintenance of the new facilities results in temporary noise levels. Operation of the Kern Fan Element requires pumping to convey water to percolation ponds, to extract water from underground, and to convey water in the Kern Water Bank Canal. Electric motors power the pumps. A representative range of noise levels for pumps is estimated to be 68 to 72 dBA (see Table 7.12-5) at 50 feet. The installation and operation of pumps associated with the construction of percolation ponds in the Kern Fan Element attributable to the proposed project would result in an increase in noise emissions from pumps compared to pre-1995 conditions. However, increased noise levels would not affect sensitive receptors because the pumps are located in relatively remote areas far from homes and businesses. Ongoing maintenance of the new facilities is intermittent and not considered a substantial source of increased noise levels at sensitive land uses. Therefore, these land use changes are considered to have a ***less-than-significant impact***.

Mitigation Measures

None required.

Future Impacts

In the future, it is expected that the KWBA would construct an additional 1,200 acres of percolation ponds. The construction-related noise impacts are temporary and short-term and would be considered less than significant. Operation of the Kern Fan Element requires pumping to convey water to percolation ponds and to extract water from underground. A representative range of noise levels for electric pumps is estimated to be 68 to 72 dBA (see Table 7.12-3) at 50 feet. If proper mufflers are provided, noise levels could be further reduced. The installation and operation of pumps associated with the operation of percolation ponds in the Kern Fan Element attributable to the proposed project could result in an increase in noise levels. However, increased noise levels would not affect sensitive receptors because the pumps are located in relatively remote areas far from homes and businesses. Additionally, maintenance of the new facilities would occur intermittently and would not constitute a significant increase in

area noise levels. Thus, any such construction and operation activities are considered to create a ***less-than-significant impact***.

The KWBA manages lands within the Kern Fan Element in accordance with a Habitat Conservation Plan (HCP) approved by U.S. Fish and Wildlife Service (USFWS) in 1997. The HCP allows developed uses on about 4,000 acres of the Kern Fan Element. Developed uses include farming, permanent facilities for the Kern Water Bank and commerce. Approximately 490 acres are designated for possible commercial use. Between 1995 and 2003, no development occurred on the 490-acre parcel. The Settlement Agreement prohibits development of this parcel, and so under the proposed project the parcel would remain undeveloped. Noise levels at the parcel would be unchanged.

Mitigation Measures

None required.

7.12-4 Fluctuation in water levels at Castaic Lake, Lake Perris, Lake Oroville, and San Luis Reservoir could potentially alter the amount of recreational boating at the reservoirs, which could affect noise levels.

1996 — 2003

The amount of recreational boat use usually increases with increasing water levels at reservoirs where people normally participate in these types of recreational activities. Conversely, boating decreases when water levels are lower.

As described in Section 7.1, Surface Water Hydrology, Water Quality, and Water Supply average water surface elevations at Castaic Lake and Lake Perris were higher between 1996 and 2003 than in the pre-Monterey Amendment period before 1995. At Lake Oroville changes in the amount of water stored were small and insufficient to have an effect on water surface elevations and water levels in San Luis Reservoir would be higher during winter months (see Impact 7.1-4 in Section 7.1).

Recreational activities would not have changed as a result of project implementation in Lake Oroville or San Luis Reservoir. Recreational activities could have been enhanced in Castaic Lake and Lake Perris as a result of increased water levels during the boating season. However, the range of water surface fluctuations would have been within the range of operating conditions prior to project implementation. Therefore, increased water surface levels would not have been expected to result in much of an increase in the amount of boating days or numbers of boats and, in turn, boating-related noise levels over pre-Monterey conditions. Increases in noise levels would not have increased by more than 3 dBA over the long-term. Consequently, this would have been a ***less-than-significant impact***.

Mitigation Measures

None required.

Future Impacts

As discussed above, the amount of recreational boat use usually increases with increasing water levels at reservoirs where people normally participate in these types of recreational activities. Conversely, boating decreases when water levels are lower.

As described in Section 7.1, average water surface elevations at Castaic Lake and Lake Perris would be similar to historical ranges and baseline conditions (2003). However, water levels in San Luis Reservoir could be lower during winter months (see Impact 7.1-4 in Section 7.1).

Recreational activities would not change as a result of project implementation in Lake Oroville or San Luis Reservoir. Recreational activities could be enhanced in Castaic Lake and Lake Perris as a result of increased water levels during the boating season. Although, the range of water surface elevations would be anticipated to be within the range of operating conditions prior to project implementation for Castaic Lake and Lake Perris, recreational activities could be affected by the drawdown allowed through Article 54 of the proposed project. Article 54 provisions allow for several contractors to drawdown these two reservoirs to half their maximum capacity for up to five years before repayment. Although the worst-case condition could occur, it would be unlikely (as discussed in Chapter 6). Assuming that future flexible storage use is similar to historic use since 1996, no significant impact would occur. If the worst-case scenario were to occur, water surface levels would decrease the amount of boating days or numbers of boats and, in turn, boating-related noise levels more than what would have occurred in the absence of the project. Consequently, this would be a ***less-than-significant impact***.

Mitigation Measures

None required.

7.12-5 Fluctuation in water levels at Castaic Lake, Lake Perris, Lake Oroville, and San Luis Reservoir could potentially alter the amount of recreational uses at the reservoirs, which could affect traffic noise levels.

1996 — 2003

As discussed in Impact 7.12-4, higher water surface elevations at Castaic Lake and Lake Perris, could have created more opportunities for recreational activities. This could have increased the number of vehicle trips to and from the reservoirs on a seasonal basis that would, in turn, result in increases in traffic-generated noise on a seasonal basis. However, it is unlikely that the number of vehicles would have substantially increased to levels where noise thresholds would have been exceeded on a permanent basis such that there would have been a conflict with the local noise standards. San Luis Reservoir water surface levels would be lower during winter months, so recreation-related vehicle traffic noise would not be substantially affected. Therefore, this would have been a ***less-than-significant impact***.

Mitigation Measures

None required.

Future Impacts

As discussed in Impact 7.12-4, water surface elevations at Castaic Lake and Lake Perris, could result in fewer opportunities for recreational activities. This could decrease the number of vehicle trips to and from the reservoirs on a seasonal basis that would, in turn, result in decreases in traffic-generated noise on a seasonal basis more than what would have occurred in the absence of the project. However, within normal SWP operating conditions it is unlikely that the number of vehicles would be substantially different than baseline conditions. At Lake Oroville, changes in the amount of water stored would be small and insufficient to have an effect on water surface elevations and water levels in San Luis Reservoir would be higher during winter months, so recreation-related vehicle traffic noise would not be substantially affected. Therefore, this would be a ***less-than-significant impact***.

Mitigation Measures

None required.

7.12-6 Implementation of the proposed project could potentially affect noise levels in Plumas County as a result of watershed improvement projects.

1996 — 2003

Because the Settlement Agreement was not completed in this period, there were no watershed improvement project as a result of the proposed project and there was ***no impact***.

Future Impacts

The Settlement Agreement provides funds to Plumas County to establish a watershed forum and implement watershed improvement projects. The watershed forum would identify opportunities for watershed improvements and would oversee the implementation of individual projects. Watershed improvement projects take many forms, but most involve actions to prevent erosion and restore wildlife habitat along streams and rivers. In general, projects of this type improve the appearance of stream banks by returning them to a more natural condition.

The types of projects that are anticipated would include stream restoration (revegetation of stream banks and removal of non-native species, for example), preventing stream down-cutting and gullying through the creation of a series of ponds and drop structures, well drilling, and unpaved road improvements to reduce erosion and sedimentation. The number and size of watershed improvement projects that would result from the proposed project are relatively small. The projects would be expected to improve conditions along a few miles of stream bank in a county with thousands of miles of stream channels. These activities could result in temporary increases in construction noise levels at the site of the improvements. Noise would be generated by the use of equipment such as backhoes, trucks, and drilling equipment. The improvements would generally occur in locations where little or no development is present. No operational increase in noise levels would be anticipated. The potential noise impact from construction activities would be short-term and is considered to be ***less than significant***.

Mitigation Measures

None required.

ENDNOTES

1. Federal Railroad Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, December 1998.

2. Federal Highway Administration, *Highway Noise Fundamentals*, United States Department of Transportation, September 1980.

3. Federal Highway Administration, *Highway Noise Fundamentals*, United States Department of Transportation, September 1980.

4. Federal Railroad Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, December 1998.

5. Kern County Planning Department, *Noise Element of the Kern County General Plan*, December 1989.

6. Plumas County, *Plumas County General Plan*, February 1994.