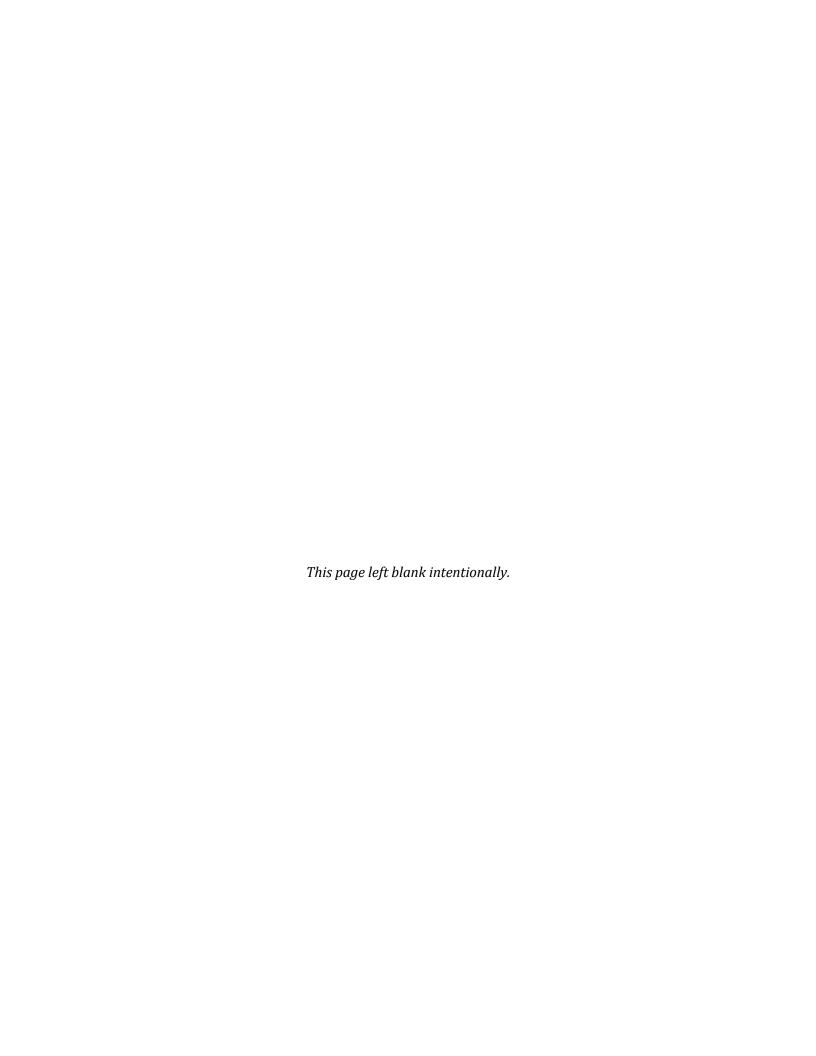
## Appendix K2

DWR GHG Emissions Reduction Plan Consistency
Determination Forms



# DWR GHG Emissions Reduction Plan Consistency Determination For

## **Consistency Determination Form** For Projects Using Contractors or Other Outside Labor

This form is to be used by DWR project managers to document a DWR CEQA project's consistency with the DWR Greenhouse Gas Emissions Reduction Plan. This form is to be used only when DWR is the Lead Agency and when

contractors or outside labor and equipment are use to implement the project.

California Department of Water Resources 1416 9th Steet Sacramento, CA 95814 dwrclimatechange.water.ca.gov www.water.ca.gov/climatechange

Additional Guidance on filling out this form can be found at: dwrclimatecange.water.ca.gov/guidance\_resources.cfm

mtCO₂e in any single year of construction.

**Project Name:** 

The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at: http://www.water.ca.gov/climatechange/CAP.cfm

<b>Environmental Docu</b>	ıment type:	Draft EIS/EIR			
Manager's Name:					
Manager's email:					
Division:					
Office, Branch, or Fie	eld Division				
deeper than Fremont Weir, with gates to do notch would be at an elevation of 14 feet, would be able to flow through the notch of Fremont Weir (at an elevation of 32 feet Alternative 1 would connect the new gate Yolo Bypass. Alternative 1 would have the would allow flows up to 6,000 cfs, depend channel flow for adult fish passage, juvenis upplemental fish passage facility on the very supplemental fish passage facility supplemental fish passage facility supplemental fish passage facility supplemental fish passage facility supplemental fis				Weir. The gated notch wo ter going through the fac pproximately 18 feet beloiods when the river eleval of Tule Pond with a channel most direct access to cramento River elevation, and floodplain inunction, and floodplain inunction, and floodplain inunction,	uld create an opening in Fremont Weir, that is fility into the Yolo Bypass. The invert of the new ow the existing Fremont Weir crest. Water tions are not high enough to go over the crest el that parallels the existing east levee of the the Tule Canal for migrating fish. Alternative 1 through the gated notch to provide open lation. This alternative would include a ovements to allow fish to pass through
Project GHG En	nissions 5	ummary		1.00	
Total Constructio	n Emission	S	4,866	mtCO2e	
Maximum Annual Construction Emissions		4,866	mtCO2e		
11 🗸 1				ongoing operational, maintenance, or and analyzed in the GGERP.	
Extraordinary Co	onstruction	n Project Deter	mination		

Yolo Bypass Salmonid Habitat Restoration and Fish Passage

Yes - Addition analysis is required, consult with C4

No - Additional analysis not required

Do total project construction emissions exceed 25,000 mtCO<sub>2</sub>e for the entire construction phase or exceed 12,500

# Appendix K2 Consistency Determination Forms

## **Project GHG Reduction Plan Checklist**

All Project Level GHG Emissions Red implementation plan for the projec	All Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project. (Project Level GHG Emissions Reduction Measures)					
	Or					
design or implementation plan for	sions Reduction Measures have been incorporated into the the project and and Measures not incorporated have been to the proposed project (include as an attachment)					
Project does not conflict with any o  (Specific Action GHG Emissions Red	of the Specific Action GHG Emissions Reduction Measures Juction Measures)					
Would implementation of the project r	result in additional energy demands on the					
SWP system of 15 GWh/yr or greater?						
○ Yes						
If you answered Yes, attach a Renewab approval letter from the DWR SWP Pow	· · · · · · · · · · · · · · · · · · ·					
	effects of the proposed project may be cumulatively posed project's compliance with the requirements of the					
○ Yes ● No						
	eligible for streamlined analysis of GHG emissions using the See CEQA Guidelines, section 15183.5, subdivision (b)(2).)					
completed pursuant to the above referenced project,	nation provided in associated environmental documentation the DWR CEQA Climate Change Committee has determined Greenhouse Gas Reduction Plan and the greenhouse gasses ysis.					
Project Manager Signature:	Date:					
C4 Approval Signature:	Date:					
	Attachments:					
	□ GHG Emissions Inventory					
	List and Explanation of excluded Project Level GHG Emissions Reduction Measures					
	Plan to update Renewable Energy Procurement Plan from DWR SWP Power and Risk Office					

## DWR GHG Emissions Reduction Plan Consistency Determination For **Consistency Determination Form**



## For Projects Using Contractors or Other Outside Labor

This form is to be used by DWR project managers to document a DWR CEQA project's consistency with the DWR Greenhouse Gas Emissions Reduction Plan. This form is to be used only when DWR is the Lead Agency and when contractors or outside labor and equipment are use to implement the project.

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**Extraordinary Construction Project Determination** 

mtCO<sub>2</sub>e in any single year of construction.

dwrclimatechange.water.ca.gov www.water.ca.gov/climatechange

The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at: http://www.water.ca.gov/climatechange/CAP.cfm

Project Name:		Yolo Bypass Salmonid Habitat Rest	oration and Fish Passage			
Environmental Document type:		Draft EIS/EIR				
Manager's Name:	:					
Manager's email:						
Division:						
Office, Branch, or	Field Division					
Short Project Description:	for Alternative the notch near invert elevation bend of the rive bends (DWR 20 existing conditi Alternative 2 w up to 6,000 cfs, fish passage, ju	The primary difference between A he center of Fremont Weir. This gar that is higher (14.8 feet) because the Studies have indicated that juver 7). The new gated notch would allons, where flows only enter the Yolkuld include facilities to connect the depending on Sacramento River elections.	Alternatives 1 and 2 is the lead notch would be similared notch would be similared river is higher at this upuile fish may be found in grow flow to pass into the Yoo Bypass when Fremont We gated notch to the existic evation, through the gated undation. This alternative	ng Tule Pond. Alternative 2 would allow flows d notch to provide open channel flow for adult would also include a supplemental fish passage		
Project GHG Emissions Summary						
Total Construction Emissions		9,924	mtCO2e			
Maximum Annual Construction Emissions		on Emissions 9,924	mtCO <sub>2</sub> e			
All other emissions from the project not accounted for above will occur as ongoing operational, maintenance, or						

Yes - Addition analysis is required, consult with C4

No - Additional analysis not required

business activity emissions and therefore have already been accounted for and analyzed in the GGERP.

Do total project construction emissions exceed 25,000 mtCO<sub>2</sub>e for the entire construction phase or exceed 12,500

# Appendix K2 Consistency Determination Forms

	• -				<b>D.</b> I	<b>~</b> I II .
Dro	inct	C	Dodin	tion I	Dian	Chacklist
PIU	ıecı	ОПО	neuut	.LIVII I	riali	Checklist
	,					

All Project Level GHG Emiss implementation plan for th				
	Or			
All feasible Project Level GF design or implementation plisted and determined not be	olan for the p	roject and and Meas	sures not incorpora	ted have been
Project does not conflict wi (Specific Action GHG Emissi			Emissions Reduction	on Measures
Would implementation of the p	oroject result	in additional energy	y demands on the	
SWP system of 15 GWh/yr or g	reater?			
○ Yes				
If you answered Yes, attach a R approval letter from the DWR S			an update	
Is there substantial evidence the considerable notwithstanding DWR GHG Reduction Plan?				•
○ Yes    No				
If you answered Yes, the project DWR GHG Emissions Reduction	_		•	_
l on the information provided above an leted pursuant to the above referenced he proposed project is consistent with t ed by the project are covered by the pla	l project, the D the DWR Gree	WR CEQA Climate Ch	ange Committee has	determined
Project N Signatur				Date:
C4 Appro Signatur	<b>I</b>			Date:
		Attachments	:	
			sions Inventory	
			xplanation of excl	
			odate Renewable I DWR SWP Power	

# DWR GHG Emissions Reduction Plan Consistency Determination Form

# **Consistency Determination Form**

## For Projects Using Contractors or Other Outside Labor



This form is to be used by DWR project managers to document a DWR CEQA project's consistency with the DWR Greenhouse Gas Emissions Reduction Plan. This form is to be used only when DWR is the Lead Agency and when contractors or outside labor and equipment are use to implement the project.

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www.water.ca.gov/climatechange

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The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at: http://www.water.ca.gov/climatechange/CAP.cfm

Project Name:	Yolo Bypass Salmonid Habitat Restoration and Fish Passage		
Environmental Docu	ment type: Draft EIS/EIR		
Manager's Name:			
Manager's email:			
Division:			
Office, Branch, or Fie	ld Division		
Short Project Al	Alternative 3, West Side Gated Notch, would provide a new gated notch through F		

## **Description:**

emont Weir similar to the notch described for Alternative 1. The primary difference between Alternatives 1 and 3 is the location of the notch; Alternative 3 would site the notch on the western side of Fremont Weir. This gated notch would be similar in size to Alternative 1 but would have an invert elevation that is higher (16.1 feet) because the river is higher at this location. The western location is on the outside of a river bend, similar to Alternative 2, but would be easier to access for operations and maintenance (O&M) than a central location. The new gated notch would allow flow to pass into the Yolo Bypass at lower river elevations than under existing conditions where flows only enter the Yolo Bypass when Fremont Weir overtops.

Alternative 3 would include facilities to connect the gated notch to the existing Tule Pond. Alternative 3 would allow flows up to 6,000 cfs, depending on Sacramento River elevation, through the gated notch to provide open channel flow for adult fish passage, juvenile emigration, and floodplain inundation. This alternative would also include a supplemental fish passage facility on the eastern side of Fremont Weir and improvements downstream of Tule Pond.

Project GHG Emissions Summary			
Total Construction Emissions	9,008	mtCO <sub>2</sub> e	
Maximum Annual Construction Emissions	9,008	mtCO <sub>2</sub> e	
		above will occur as ongoing operational, maintenance, or been accounted for and analyzed in the GGERP.	
Extraordinary Construction Project Determined			
. ,	ed 25,000 mt(	$CO_2$ e for the entire construction phase or exceed 12,500	
$mtCO_2e$ in any single year of construction. $\bigcirc$ Yes - Addition analysis is required, consult with C4			
	No	- Additional analysis not required	

# Appendix K2 Consistency Determination Forms

## **Project GHG Reduction Plan Checklist**

	All Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project. (Project Level GHG Emissions Reduction Measures)						
	Or						
design or implementation plan for	sions Reduction Measures have been incorporated into the the project and and Measures not incorporated have been to the proposed project (include as an attachment)						
Project does not conflict with any of (Specific Action GHG Emissions Reco	of the Specific Action GHG Emissions Reduction Measures duction Measures)						
Would implementation of the project of SWP system of 15 GWh/yr or greater?	result in additional energy demands on the						
Yes No							
If you answered Yes, attach a Renewab approval letter from the DWR SWP Pov							
	effects of the proposed project may be cumulatively posed project's compliance with the requirements of the						
○ Yes ● No							
	If you answered Yes, the project is not eligible for streamlined analysis of GHG emissions using the DWR GHG Emissions Reduction Plan. (See CEQA Guidelines, section 15183.5, subdivision (b)(2).)						
completed pursuant to the above referenced project,	nation provided in associated environmental documentation , the DWR CEQA Climate Change Committee has determined Greenhouse Gas Reduction Plan and the greenhouse gasses ysis.						
Project Manager Signature:	Date:						
C4 Approval Signature:	Date:						
	Attachments:						
	$\Box$ List and Explanation of excluded Project Level GHG Emissions Reduction Measures						
	$\Box$ Plan to update Renewable Energy Procurement Plan from DWR SWP Power and Risk Office						

# DWR GHG Emissions Reduction Plan Consistency Determination Form

## **Consistency Determination Form** For Projects Using Contractors or Other Outside Labor



This form is to be used by DWR project managers to document a DWR CEQA project's consistency with the DWR Greenhouse Gas Emissions Reduction Plan. This form is to be used only when DWR is the Lead Agency and when contractors or outside labor and equipment are use to implement the project.

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www.water.ca.gov/climatechange

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The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at: http://www.water.ca.gov/climatechange/CAP.cfm

Project Name:		Yolo Bypass Salmonid Habitat Restoration and Fish Passage			
Environmental Document type:		Draft EIS/EIR			
Manager's Name	e:				
Manager's email	l:				
Division:					
Office, Branch, o	or Field Division				
Alternative 4, West Side Gated Notch – Managed Flow, would have a smaller amount of flow entering the Yolo Bypass through the gated notch in Fremont Weir than the other alternatives, but it would incorporate water control structures to maintain inundation in defined areas for longer periods of time within the northern Yolo Bypass. Alternative 4 would includ the same gated notch and associated facilities as described for Alternative 3. However, it would be operated to limit the maximum inflow to approximately 3,000 cfs.  Alternative 4 includes two water control structures on Tule Canal to extend periods of inundation locally. A bypass channel would be constructed around each water control structure to provide adult fish passage when the water control structures are controlling flow. This alternative would also provide means for fish passage on the eastern side of Fremont Weir through a supplemental fish passage facility. In addition, improvements to Agricultural Road Crossing 1 and the downstream channel would be implemented under this alternative.					
Project GHG	Emissions S				
Total Constru	ction Emission	mtCO <sub>2</sub> e			
Maximum Annual Construction Emissions		ion Emissions 18,034 mtCO2e			
		the project not accounted for above will occur as ongoing operational, maintenance, or ns and therefore have already been accounted for and analyzed in the GGERP.			
Do total proje	•	n Project Determination n emissions exceed 25,000 mtCO₂e for the entire construction phase or exceed 12,500 construction.  (a) Yes - Addition analysis is required, consult with C4			

No - Additional analysis not required

# Appendix K2 Consistency Determination Forms

## **Project GHG Reduction Plan Checklist**

1101	duction Measures have been incorporated into the design or ct. (Project Level GHG Emissions Reduction Measures)
	Or
design or implementation plan for	sions Reduction Measures have been incorporated into the the project and and Measures not incorporated have been to the proposed project (include as an attachment)
Project does not conflict with any of (Specific Action GHG Emissions Rec	of the Specific Action GHG Emissions Reduction Measures duction Measures)
Would implementation of the project of SWP system of 15 GWh/yr or greater?  Yes No	result in additional energy demands on the
If you answered Yes, attach a Renewab approval letter from the DWR SWP Pov	·
	effects of the proposed project may be cumulatively posed project's compliance with the requirements of the
○ Yes ● No	
	eligible for streamlined analysis of GHG emissions using the (See CEQA Guidelines, section 15183.5, subdivision (b)(2).)
completed pursuant to the above referenced project,	nation provided in associated environmental documentation , the DWR CEQA Climate Change Committee has determined I Greenhouse Gas Reduction Plan and the greenhouse gasses ysis.
Project Manager Signature:	Date:
C4 Approval Signature:	Date:
	Attachments:
	□ GHG Emissions Inventory
	$\Box$ List and Explanation of excluded Project Level GHG Emissions Reduction Measures
	Plan to update Renewable Energy Procurement Plan from DWR SWP Power and Risk Office

## DWR GHG Emissions Reduction Plan Consistency Determination Form **Consistency Determination Form**

## For Projects Using Contractors or Other Outside Labor

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www.water.ca.gov/climatechange

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The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at: http://www.water.ca.gov/climatechange/CAP.cfm

Project Name:		Yolo Bypass Salmonid Habitat Restoration and Fish Passage						
Environmental Document type:		Draft EIS/EIR						
Manager's Name:								
Manager's email:								
Division:								
Office, Branch, or I	Field Division							
Notches, has the goal of increasing channels create some limitations for channel is smaller at this elevation) gates so that the deeper gate could move to other gates when the river.  Alternative 5 incorporates multiple combined flows of up to 3,400 cfs. alternative would include a suppler allow fish to pass through Agriculture.			or fish passage be ) when winter-run d allow more flow r is higher to cont e gated notches in As the river rises, mental fish passa	cause they have so n Chinook salmon of to enter the bypa grol inflows while ro n the central location the deeper gate was ge facility on the v	maller fl are out- ass wher maintair on on th ould clo	lows at lower rive migrating. Altern In the river is at low ning fish passage The existing Fremo Tose and the next	er elevations (becanative 5 includes mative 5 includes materials) wer elevations. Floconditions.  Ont Weir that would open.	ause the nultiple ows would  Id allow . This
Project GHG E	missions S	ummary						
Total Construct		•	21,179	mtCO2e				
Maximum Annual Construction Emissions		20,672	mtCO2e					
		the project not ons and therefor						nance, or
Extraordinary ( Do total project mtCO <sub>2</sub> e in any s	construction	n emissions exce	eed 25,000 mt(	CO₂e for the en		•		12,500

No - Additional analysis not required

# Appendix K2 Consistency Determination Forms

## **Project GHG Reduction Plan Checklist**

All Project Level GHG Emissions Red implementation plan for the projec	All Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project. (Project Level GHG Emissions Reduction Measures)					
	Or					
design or implementation plan for	sions Reduction Measures have been incorporated into the the project and and Measures not incorporated have been to the proposed project (include as an attachment)					
Project does not conflict with any o  (Specific Action GHG Emissions Red	of the Specific Action GHG Emissions Reduction Measures Juction Measures)					
Would implementation of the project r	result in additional energy demands on the					
SWP system of 15 GWh/yr or greater?						
○ Yes						
If you answered Yes, attach a Renewab approval letter from the DWR SWP Pow	· · · · · · · · · · · · · · · · · · ·					
	effects of the proposed project may be cumulatively posed project's compliance with the requirements of the					
○ Yes ● No						
	eligible for streamlined analysis of GHG emissions using the See CEQA Guidelines, section 15183.5, subdivision (b)(2).)					
completed pursuant to the above referenced project,	nation provided in associated environmental documentation the DWR CEQA Climate Change Committee has determined Greenhouse Gas Reduction Plan and the greenhouse gasses ysis.					
Project Manager Signature:	Date:					
C4 Approval Signature:	Date:					
	Attachments:					
	□ GHG Emissions Inventory					
	List and Explanation of excluded Project Level GHG Emissions Reduction Measures					
	Plan to update Renewable Energy Procurement Plan from DWR SWP Power and Risk Office					

# DWR GHG Emissions Reduction Plan Consistency Determination Form

## Appendix K2

## **Consistency Determination Form** For Projects Using Contractors or Other Outside Labor



This form is to be used by DWR project managers to document a DWR CEQA project's consistency with the DWR Greenhouse Gas Emissions Reduction Plan. This form is to be used only when DWR is the Lead Agency and when contractors or outside labor and equipment are use to implement the project.

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www.water.ca.gov/climatechange

Additional Guidance on filling out this form can be found at: dwrclimatecange.water.ca.gov/guidance\_resources.cfm

**Project Name:** 

**Environmental Document type:** 

The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at: http://www.water.ca.gov/climatechange/CAP.cfm

Draft EIS/EIR

Manager's Name	:		
Manager's email:			
Division:			
Office, Branch, o	Field Division		
Short Project Description:	Yolo Bypass. It v Sacramento Riv event of the sea into the bypass salmon out-mig facility on the ea	vas designed with the real is at lower elevates is at lower elevates is at lower elevates. This flow ever under Alternatives tration, potentially astern side of Frem	is a large notch in the western location that would allow flows up to 12,000 cfs to enter the he goal of entraining more fish while allowing more flow into the bypass when the ions. Typically, winter-run Chinook salmon move downstream during the first high flow it is sometimes not high enough to result in what would be considered substantial flows 1 through 5. The gated notch could allow more flow to enter during winter-run Chinook maximizing fish entrainment. This alternative would include a supplemental fish passage ont Weir and improvements to allow fish passage through Agricultural Road Crossing 1 ral Road Crossing 1. The alignment is the same as shown for Alternative 3.
Project GHG	Emissions S	ummary	
Total Construc			17,669 mtCO <sub>2</sub> e
Maximum Anr	nual Construct	ion Emissions	17,669 mtCO <sub>2</sub> e
			accounted for above will occur as ongoing operational, maintenance, or e have already been accounted for and analyzed in the GGERP.
_		n <b>Project Deter</b> n emissions exce	mination red 25,000 mtCO <sub>2</sub> e for the entire construction phase or exceed 12,500
mtCO₂e in any	single year of	construction.	<ul><li>Yes - Addition analysis is required, consult with C4</li></ul>
			○ No - Additional analysis not required

Yolo Bypass Salmonid Habitat Restoration and Fish Passage

# Appendix K2 Consistency Determination Forms

GHG Reduction Plan Checklist
All Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project. (Project Level GHG Emissions Reduction Measures)
Or
All feasible Project Level GHG Emissions Reduction Measures have been incorporated into the

Project does not conflict with any of the Specific Action GHG Emissions Reduction Measures (Specific Action GHG Emissions Reduction Measures)

design or implementation plan for the project and and Measures not incorporated have been listed and determined not be apply to the proposed project (include as an attachment)

Would implementation of the project result in additional energy demands on the SWP system of 15 GWh/yr or greater?

If you answered Yes, attach a Renewable Power Procurement Plan update approval letter from the DWR SWP Power and Risk Office.

Is there substantial evidence that the effects of the proposed project may be cumulatively considerable notwithstanding the proposed project's compliance with the requirements of the DWR GHG Reduction Plan?

If you answered Yes, the project is not eligible for streamlined analysis of GHG emissions using the DWR GHG Emissions Reduction Plan. (See CEQA Guidelines, section 15183.5, subdivision (b)(2).)

Based on the information provided above and information provided in associated environmental documentation completed pursuant to the above referenced project, the DWR CEQA Climate Change Committee has determined that the proposed project is consistent with the DWR Greenhouse Gas Reduction Plan and the greenhouse gasses emitted by the project are covered by the plan's analysis.

Project Manager Signature:	Date:	
C4 Approval Signature:	Date:	

Attachments:

 $\hfill \Box$  List and Explanation of excluded Project Level GHG Emissions Reduction Measures

Plan to update Renewable Energy Procurement Plan from DWR SWP Power and Risk Office

## Appendix L

**Noise and Vibration Calculations** 

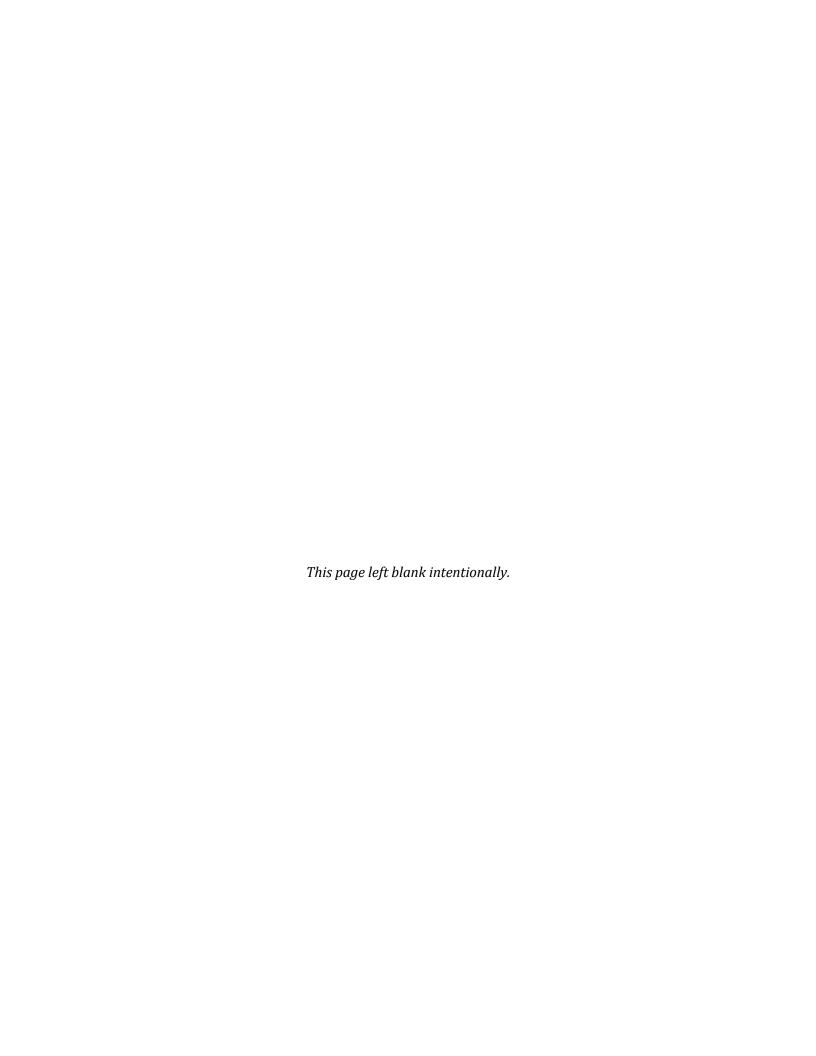


Table L-1. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	
02 - Relocations	- Andrews and the second	dal Share			1 1 1 7 2 1 1	1 1	(3)	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	3.5 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	0.8 CY Loader/Backhoe, Wheel (1)	Backhoe	40%	78	74	1	0	74
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
, ,	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals		·						<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	28	14	84
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
( :::::::::::::::::::::::::::::::::::::	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Earthen Backfill	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1 1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	, 14	86
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
pp	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86

Phase 02 - Relocations Mobilization and Demobilization	Equipment Description											I							I										
02 - Relocations	Equipment Description	1.	1	1								1							l									ļ	
02 - Relocations	Equipment Description		<u>ہ</u> ا			_	ا ي	_			40	,,	1,0	40	,,	4-	,,	,_	4.	4.0							_	27	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Mobilization and Demobilization	E. a. 1. T. 1. (4											ı	1		1	T		T	1	T	T		1	T	T				
	Flatbed Truck (1 per piece of equipment)																											-	
	Extended Boom Pallet Loader (1)																											1	
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																											ļ	l
	3.5 CY Front End Loader, Wheel (1)																											ļ	I
	0.8 CY Loader/Backhoe, Wheel (1)																											ļ	I
	4000 Gal Water Truck (1)																											ļ	I
	16 CY 3 Axle Dump Truck (1)																											ļ	I
	Pickup Truck Conventional (6)																											ļ	I
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												ı
	Pickup Truck Conventional (1)																												ı
	16 CY 3 Axle Dump Truck (5)																												ı
Temporary Electrical Power	Flatbed Truck (1)																											<del>'                                    </del>	
	Pickup Truck Conventional (2)																											ļ	I
09 - Channels and Canals	[																												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																			I			T T					$\overline{}$	
Modification and Bomodification	Extended Boom Pallet Loader (1)																											ļ	l
	Pickup Truck Conventional (1)																											ļ	l
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
Cleaning and Crubbing	Trailer Mounted Brush Chipper (1)																											ļ	l
	Chainsaw (1)																											ļ	l
																												ļ	l
	4000 Gal Water Truck (1)																											ļ	l
	Pickup Truck Conventional (6)																											ļ	I
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																											ļ	l
	300 HP Dozer (2)																											ļ	l
	3.5 CY Front End Loader, Wheel (2)																											ļ	l
	16 CY 3 Axle Dump Truck (9)																											ļ	l
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																											ļ	l
	21 CY Scrapers (4)																											ļ	l
	12' Blade Grader (1)																											ļ	l
	4000 Gal Water Truck (1)																											ļ	l
	Pickup Truck Conventional (7)																											ļ	I
Earthen Backfill	300 HP Dozer (1)																												1
	4000 Gal Water Truck (1)																											ļ	l
	10 TN Smooth Roller (1)																											ļ	I
	Pickup Truck Conventional (3)																												ı
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
· ·	300 HP Dozer Crawler (1)	1																											I
	Pickup Truck Conventional (5)	1																											I
	16 CY 3 Axle Dump Trucks (23)	1																											I
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	1																										$\overline{}$	
	300 HP Dozer Crawler (1)	1																											I
	Pickup Truck Conventional (5)																												I
İ	16 CY 3 Axle Dump Trucks (23)	1																											İ

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
11-Levees and Floodwalls	( )		1070			<u> </u>		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	7	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Soil Cement Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	2.5 CY Hydraulic Excavators (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Flash Mixer (1)	Soil Mix Drill Rig	50%	80	77	1	0	77
	Slurry Pump (1)	Pumps	50%	81	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
15 - Floodway Control and Diversion Struc								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	14	11	81
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
,	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	78	1	0	78
5 ( I 5)	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	10	82
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Concrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77

<u></u>	T										_		
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)												
	300 HP Dozer Crawler (1)												
	Pickup Truck Conventional (5)												
	16 CY 3 Axle Haul Trucks (23)												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)												
	Pickup Truck Conventional (4)												
11-Levees and Floodwalls				 	 	 	 				 	 	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Soil Cement Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)												
	300 HP Dozer (1)												
	2.5 CY Hydraulic Excavators (1)												
	16 CY 3 Axle Dump Truck (1)												
	Flash Mixer (1)												
	Slurry Pump (1)												
	Pickup Truck Conventional (5)												
15 - Floodway Control and Diversion Struc		,							<u> </u>			 	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												A
	Pickup Truck Conventional (1)												A
Construction Site Dewatering	Flatbed Truck (1)												
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)												
	Pickup Truck Conventional (3)												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)												
	300 HP Dozer (2)												
	3.5 CY Front End Loader, Wheel (2)												
	16 CY 3 Axle Dump Truck (9)												
	Pickup Truck Conventional (7)												
Sheet Pile Wall	Flatbed Truck (1)												
	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)												
	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Concrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												
Headworks Structure	Concrete Pump Boom Truck Mounted (1)												
	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (7)												
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)												+
Tanonia Chambrida	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (6)												
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)		+										+
I III god Dottom Oates	Haul Truck Oversize Transport (1)												
	Pickup Truck Conventional (4)												
	i lokup Truck Collyelillollal (4)												

08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	5	7	77
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
S	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Cocnrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
Ü	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
3 1	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
19 - Buildings, Grounds, and Utilities								<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad	165 HP Dozer (1)	Dozer	40%	82	78	1	0	78
Construction	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 GAL Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79	75	1	0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Electrical Control Equipment CMU Building	1	Pickup Truck	40%	75	71	3	5	76
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Communication Equipment	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

— Ten Percent Design: Draft Technical Memorandum Constructability and Construction

08 - Roads, Railroads, and Bridges											
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)										
	Extended Boom Pallet Loader (1)	'									
	Pickup Truck Conventional (1)	'									
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)										
-	100 FT Auger Track Mounted Drill Rig (1)	'									
	Concrete Pump Boom Truck Mounted (1)	'									
	Cocnrete Mixer Truck (3)	'									
	0.8 CY Backhoe Loader (1)	'									
	24 TN Truck End Dump (2)	'									
	Pickup Truck Conventional (8)	'									
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)										
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	'									
a	Concrete Mixer Truck (2)	'									
	Pickup Truck Conventional (7)	'									
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)			+ +							
. Sassaran Briago opan motanation	Flatbed Truck (2)										
	Pickup Truck Conventional (5)	'									
19 - Buildings, Grounds, and Utilities	riokap rraok conventional (o)										
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)										
	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (1)										
CMU Building and Earthwork Pad	165 HP Dozer (1)										
Construction	Scraper (1)										
Concuración	Motor Grader (1)										
	Compactor (1)										
	4000 GAL Water Truck (1)										
	10 TN Smooth Roller (1)										
	Pickup Truck Conventional (7)										
	Concrete Pump Boom Truck Mounted (1)										
	2.5" Dia. Concrete Vibrator (1)										
	Extended Boom Pallet Loader (1)										
	Concrete Mixer Truck (1)										
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	'									
	2.5" Dia. Concrete Vibrator (1)	'									
	Concrete Mixer Truck (2)	'									
	Pickup Truck Conventional (7)										
20 -Permanent Operating Equipment				 							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	'									
	Extended Boom Pallet Loader (1)	'									
	Pickup Truck Conventional (1)										
Mechanical Hydraulic Cylinders & Housin											
	Pickup Truck Conventional (3)										
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (3)										
Electrical Control Equipment CMU Buildir											
lectrical Power Equipment CMU Building											
Communication Equipment	Pickup Truck Conventional (3)	'									

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

#### Table L-2. 8-Hour Construction Noise Level at the Receptor (dBA)

	Total Construction Leq(h) @ 50'
<b>Residential Receptor</b>	
Dist	ance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour Construction Noise Level at the Receptor (dBA)
	CNEL (Construction Noise + Existing) (dBA)
	Impact to Residential Uses
Agricultural Receptor	

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

**Background Noise** (dBA)

Daytime 55 Fremont Weir 60-65 dBA

Nighttime 45

7500

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-2. 8-Hour Construction Noise Level at the Receptor (dBA)												Е	stimat	ed Du	ıratioı	ı, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	88	94	94	97	96	96	93	96	97	93	91	91	90	91	93	92	91	92	86	80	83	87	87	87	86	85	87	80
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
1-Hour Construction Noise Level at the Receptor (dBA)	64	71	71	74	73	73	70	73	73	70	68	67	66	68	69	69	68	69	63	57	59	63	63	63	63	62	64	57
CNEL (Construction Noise + Existing) (dBA)	62	67	68	70	69	69	66	69	70	66	65	64	63	65	66	66	65	65	61	58	59	61	61	61	61	60	61	58
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	NA	NA	CA	CA	CA	CA	CA	CA	NA												
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Distance Divergence (dBA)	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
Atmospheric Attenuation (dBA)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
1-Hour Construction Noise Level at the Receptor (dBA)	74	81	81	84	83	83	80	83	83	79	78	77	76	78	79	79	78	79	73	67	69	73	73	73	73	72	74	67
CNEL (Construction Noise + Existing) (dBA)	71	77	77	80	79	79	76	79	79	76	74	74	72	74	75	75	74	75	69	64	66	70	70	70	69	68	70	64
Impact to Agricultural Uses	NA	CA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA								

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 7500

Source: Google Earth

Table L-3. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor		Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
02 - Relocations		•		•				<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	3.5 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	0.8 CY Loader/Backhoe, Wheel (1)	Backhoe	40%	78	74	1	0	74
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals								,
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	28	14	84
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
,	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
,	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Earthen Backfill	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1 1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
1 -1	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	, 14	86

Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boon Pallet Loader (1) Pickup Truck Conventional (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Buckflow, Wheel (1) 0.8 CY Sake Dump Truck (1) Pickup Truck Conventional (2) 0.8 Channels and Canals Mobilization and Demobilization Flatbed Truck (1) Pickup Truck Conventional (1) 1. Trailer Moments 1. Trail	
Mobilization and Demobilization  Fisthed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)  Framont Weir Demo  3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader Backbox, Wheel (1) 0.8 CY A Web Dump Truck (1) Pickup Truck Conventional (1) 1.8 CY 3 Avie Dump Truck (1) Pickup Truck Conventional (1) 0.9 Channels and Canals  Mobilization and Damobilization Flated Truck (1) Pickup Truck Conventional (1) Chainsow (1) 4.5 CY Hydraulic Excavator (1) 4.000 Gal Water Truck (1) Pickup Truck Conventional (1) Chainsow (1) 4.5 CY Hydraulic Excavator (1) 3.00 HP Doze (1) 1.7 Taller Mounted Dough Chipper (1) 1.7 Chainsow (1) 4.5 CY Hydraulic Excavator (1) 3.00 HP Doze (1) 1.7 State of Dump Truck (1) 1.7 State of Dump Truck (1) 1.7 State of Dump Truck (1) 1.7 Dump Truck Conventional (7) 1.7 State of Dump Truck (1) 1.7 Dump Truck Conventional (7) 1.7 State of Dump Truck (1) 1.7 Dump Truck Conventional (7) 1.7 State of Dump Truck (1) 1.7 Dump Truck COnventional (7) 1.7 State of Dump Truck (1) 1.7 State of Dump Truck (	
Modification and Demobilization  Fisibled Truck (1 per piece of equipment) Extended Boom Pallet Leader (1) Pickup Truck Conventional (1)  S.S. CY Froit End Loader, Wheel (1) O.S. CY Loader (Backhos, Wheel (1) O.S. CY Loader (1) All Conventional (1) O.S. Cy Aske Dump Truck (1) Pickup Truck Conventional (1) O.S. Cy Aske Dump Truck (1) Pickup Truck Conventional (2) O.S. Channels and Cannis Modification and Demobilization Flatbed Truck (1) Pickup Truck Conventional (1) Clains (1) All Conventional (1) O.S. Cy Aske Dump Truck (2) O.S. Cy Aske Dump Truck (3) Pickup Truck Conventional (3) O.S. Cy Aske Dump Truck (1) Pickup Truck Conventional (3) O.S. Cy Aske Dump Truck (1) Pickup Truck Conventional (3) O.S. Cy Aske Dump Truck (1)  25 26 27	
Mobilization and Demobilization   Flatbed Truck (1 per place of equipment)	25   26   27
Extended Boom Pallet Loader (1)	
Pickup Truck Conventional (1)	
S. C.Y Fydraulic Excavator (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (1)   0.8 C.Y LoaderBacknee, Wheel (2)   0.8 C.Y LoaderBacknee, Wheel (2)   0.8 C.Y LoaderBacknee, Wheel (2)   0.8 C.Y LoaderBacknee (1)   0.8 C.Y LoaderBacknee (2)   0.8 C.Y L	
S. CV Front End Loader, Wheel (1)   0.8 O'Loader(1)   0.8 O'Load	
Bear   Company	
400 Gal Water Truck (1)   16 CY 3 Aste Dump Truck (1)   17 Chainsan (1)   18 Chain	
16 CY 3 Aske Dump Truck (1)	
Pickup Truck Conventional (6)	
Levee O&M Road Regrading (6" AB)   12 Blade Grader (1)   4000 Call Water Truck (1)   Fickup Truck Conventional (1)   16 CY 3 Asle Dump Truck (5)   Flatbed Truck (1)   Flore Truck (1)   Flatbed Truck (1)   Flore Truck (1)	
4000 Gal Water Truck (1)	
Pickup Truck Conventional (1)   16 CY 3 Axle Dump Truck (1)   Pickup Truck (2)   Pickup Truck (3)   Pickup Truck (4)   Pickup Truck (7)   Pickup Truck (7)   Pickup Truck (8)   Pickup Truck (7)   Pickup Truck (8)   Pickup Truck (9)   Pickup Truck (1)   Pickup	
16 CY 3 AND Dump Truck (5)	
Temporary Electrical Power	
Pickup Truck Conventional (2)	
Mobilization and Canals  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)  Excavation (Wet Conditions)  4.5 CY Profit End Loader Crawfer (1) Trailer Mounted Brush Chipper (1) Chainsaw (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (6) 16 CY 3 Axile Dump Truck (1) Excavation (Wet Conditions)  4.5 CY Hydraulic Excavator (1) 300 HP Dozer (2) 3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axile Dump Truck (9) Pickup Truck Conventional (7) Since Profit End Loader, Wheel (2) 12 CY Scrapers (4) 12 Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7) Since Profit End Loader, Wheel (2) 16 CY 3 Axile Dump Truck (9) Pickup Truck Conventional (7) Since Profit End Loader, Wheel (2) 16 CY 3 Axile Dump Truck (9) Pickup Truck Conventional (7) Since Profit End Loader, Wheel (2) 16 CY 3 Axile Dump Truck (1) 17 Excavation/Grading (Dry Conditions) Since Profit End Loader, Wheel (2) 18 Extraordinal (7) Since Profit End Loader, Wheel (2) Since Profit End Loader, W	
Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boon Pallel Loader (1) Pickup Truck Conventional (1)  Excavation (Wet Conditions)  A 5 CY Front End Loader Crawler (1) Trailer Mounted Brush Chipper (1) Chainsaw (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (6) 16 CY 3 Axle Dump Truck (1)  Excavation (Wet Conditions)  4.5 CY Hydraulic Excavator (1) 300 HP Dozer (2) 3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axle Dump Truck (9) Pickup Truck Conventional (7)  Excavation/Grading (Dry Conditions)  300 HP Dozer (1) 21 CY Scrapers (4) 12 Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill  300 HP Dozer (1) 4000 Gal Water Truck (1) House Truck (1) 10 TN Smooth Roller (1)	
Extended Boom Pallet Loader (1)   Pickup Truck Conventional (1)   Pickup Truck Conventional (1)   Pickup Truck Conventional (1)   Pickup Truck Conventional (6)   Pickup Truck Conventional (7)   Pickup Truck (1)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck (1)   Pickup T	
Extended Boom Pallet Loader (1)   Pickup Truck Conventional (1)   Pickup Truck Conventional (1)   Pickup Truck Conventional (1)   Pickup Truck Conventional (6)   Pickup Truck Conventional (7)   Pickup Truck (1)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck (1)   Pickup T	
Pickup Truck Conventional (1)	
Clearing and Grubbing  1.5 CY Front End Loader Crawler (1) Trailer Mounted Brush Chipper (1) Chainsaw (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (6) 16 CY 3 Akle Dump Truck (1) 800 HP Dozer (2) 3.5 CY Front End Loader, Wheel (2) 16 CY 3 Akle Dump Truck (9) Pickup Truck Conventional (7)  Excavation/Grading (Dry Conditions)  5 Excavation/Grading (Dry Conditions)  Excavation/Grading (Dry Conditions)  6 Excavation/Grading (Dry Conditions)  6 Excavation/Grading (Dry Conditions)  6 Excavation/Grading (Dry Conditions)  7 Excavation/Grading (Dry Conditions)  8 Excavation/Grading (Dry Conditions)  8 Of HP Dozer (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  8 Earthen Backfill  9 Of HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
Trailer Mounted Brush Chipper (1)   Chainsaw (1)   4000 Gal Water Truck (1)   Pickup Truck Conventional (6)   16 CY 3 Axle Dump Truck (1)   300 HP Dozer (2)   3.5 CY Front End Loader, Wheel (2)   16 CY 3 Axle Dump Truck (9)   Pickup Truck Conventional (7)   21 CY Scrapers (4)   12 Blade Grader (1)   4000 Gal Water Truck (1)   Pickup Truck Conventional (7)   Earthen Backfill   300 HP Dozer (1)   4000 Gal Water Truck (1)	
Chainsaw (1)	
4000 Gal Water Truck (1) Pickup Truck Conventional (6) 16 CY 3 Axle Dump Truck (1)  Excavation (Wet Conditions)  4.5 CY Hydraulic Excavator (1) 300 HP Dozer (2) 3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axle Dump Truck (9) Pickup Truck Conventional (7)  Excavation/Grading (Dry Conditions)  300 HP Dozer (1) 21 CY Scrapers (4) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
Pickup Truck Conventional (6)   16 CY 3 Axle Dump Truck (1)	
16 CY 3 Axle Dump Truck (1)	
Excavation (Wet Conditions)  4.5 CY Hydraulic Excavator (1) 300 HP Dozer (2) 3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axle Dump Truck (9) Pickup Truck Conventional (7)  Excavation/Grading (Dry Conditions)  300 HP Dozer (1) 21 CY Scrapers (4) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
300 HP Dozer (2) 3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axle Dump Truck (9) Pickup Truck Conventional (7)  Excavation/Grading (Dry Conditions)  300 HP Dozer (1) 21 CY Scrapers (4) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axle Dump Truck (9) Pickup Truck Conventional (7)  Excavation/Grading (Dry Conditions)  300 HP Dozer (1) 21 CY Scrapers (4) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
16 CY 3 Axle Dump Truck (9)   Pickup Truck Conventional (7)	
Pickup Truck Conventional (7)	
Excavation/Grading (Dry Conditions)  300 HP Dozer (1) 21 CY Scrapers (4) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
21 CY Scrapers (4) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill 300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
4000 Gal Water Truck (1) Pickup Truck Conventional (7)  Earthen Backfill 300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
Pickup Truck Conventional (7)	
Earthen Backfill 300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
4000 Gal Water Truck (1) 10 TN Smooth Roller (1)	
10 TN Smooth Roller (1)	
Dickup Truck Conventional (2)	
Pickup Truck Conventional (3)	
Riprap - Class 2 2.5 CY Hydraulic Excavators (2)	
300 HP Dozer Crawler (1)	
Pickup Truck Conventional (5)	
16 CY 3 Axle Dump Trucks (23)	
Riprap - Class 3 2.5 CY Hydraulic Excavators (2)	
300 HP Dozer Crawler (1)	
Pickup Truck Conventional (5)	
16 CY 3 Axle Dump Trucks (23)	

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
The Bodding Material	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	, 14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
Licelett Control Cooding	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
15 - Floodway Control and Diversion Struc		Trickep Truck	1070	. 0			, and the second	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	14	11	81
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
(	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	78	1	0	78
Community (company)	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	10	82
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Concrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
08 - Roads, Railroads, and Bridges		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	5	7	77
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Cocnrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80

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RSP Bedding Material	2.5 CY Hydraulic Excavators (2)									
	300 HP Dozer Crawler (1)									
	Pickup Truck Conventional (5)									
	16 CY 3 Axle Haul Trucks (23)									
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)									
	Pickup Truck Conventional (4)									
15 - Floodway Control and Diversion Struc							 	 		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (1)									
Construction Site Dewatering	Flatbed Truck (1)									
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)									
	Pickup Truck Conventional (6)									
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)									
	Pickup Truck Conventional (3)									
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)									
, ,	300 HP Dozer (2)									
	3.5 CY Front End Loader, Wheel (2)									
	16 CY 3 Axle Dump Truck (9)									
	Pickup Truck Conventional (7)									
Sheet Pile Wall	Flatbed Truck (1)									
	75 TN Crane Crawler Pile Hammer (1)									
	Pickup Truck Conventional (6)									
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)									
	100 FT Auger Track Mounted Drill Rig (1)									
	Concrete Pump Boom Truck Mounted (1)									
	Concrete Mixer Truck (3)									
	0.8 CY Backhoe Loader (1)									
	24 TN Truck End Dump (2)									
	Pickup Truck Conventional (8)									
Headworks Structure	Concrete Pump Boom Truck Mounted (1)									
Tieadworks Structure	2.5" Dia. Concrete Vibrator (1)									
	Concrete Mixer Truck (2)									
	Pickup Truck Conventional (7)									
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)									
Headworks Charmer Transition	Concrete Mixer Truck (2)									
	Pickup Truck Conventional (6)									
Hinged Bottom Gates										
Hinged Bollom Gales	90 TN Truck Mounted Hydraulic Crane (1)									
	Haul Truck Oversize Transport (1)									
00 Doods Dailroads and Bridges	Pickup Truck Conventional (4)									
08 - Roads, Railroads, and Bridges	Clath ad Tayak (4 man piana at aguinmant)	T T				<u> </u>		<u> </u>	1	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
D 1 ( ) D 1 ( ) D 1	Pickup Truck Conventional (1)									
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)									
	100 FT Auger Track Mounted Drill Rig (1)									
	Concrete Pump Boom Truck Mounted (1)									
	Cocnrete Mixer Truck (3)									
	0.8 CY Backhoe Loader (1)									
	24 TN Truck End Dump (2)									
	Pickup Truck Conventional (8)									

Podostrian Bridge Constate Abutments	Concrete Dump Room Truck Mounted (4)	Concrete Pump Truck	200/	01	74	4	0	74
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	•	20%	81	74 73		0	74 73
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	l	1	0	
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79 75	75 74	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad	165 HP Dozer (1)	Dozer	40%	82	78	1	0	78
Construction	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79	75	1	0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
20 -Permanent Operating Equipment								•
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
incondition in jurature of mission a riccomig	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Electrical Control Equipment CMU Building		Pickup Truck	40%	75	71	3	5	76
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Communication Equipment	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Communication Equipment	Tickup Truck Conventional (5)	I lonap Haon	TU /U	70			J	,,,

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

D. L. C. A. L. C.	IO ( D D T LM ( L/4) I		1	1 1							
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)										
and Wingwalls	2.5" Dia. Concrete Vibrator (1)										
	Concrete Mixer Truck (2)										
	Pickup Truck Conventional (7)										
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)										
	Flatbed Truck (2)										
	Pickup Truck Conventional (5)										
19 - Buildings, Grounds, and Utilities					 		 				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)										
	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (1)										
CMU Building and Earthwork Pad	165 HP Dozer (1)										
Construction	Scraper (1)										
	Motor Grader (1)										
	Compactor (1)										
	4000 Gal Water Truck (1)										
	10 TN Smooth Roller (1)										
	Pickup Truck Conventional (7)										
	Concrete Pump Boom Truck Mounted (1)										
	2.5" Dia. Concrete Vibrator (1)										
	Extended Boom Pallet Loader (1)										
	Concrete Mixer Truck (1)										
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)										
	2.5" Dia. Concrete Vibrator (1)										
	Concrete Mixer Truck (2)										
	Pickup Truck Conventional (7)										
20 -Permanent Operating Equipment	<u> </u>		·		_			<u> </u>	<u> </u>		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)										
	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (1)										
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (3)										
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (3)										
Electrical Control Equipment CMU Building											
	Pickup Truck Conventional (3)										
Communication Equipment	Pickup Truck Conventional (3)										
	1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2				 				1		

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

#### Table L-4. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'
Residential Receptor
Distance from the Center of Construction Activity to a Receptor (ft)
Distance Divergence (dBA)
Atmospheric Attenuation (dBA)
1-Hour Construction Noise Level at the Receptor (dBA)
CNEL (Construction Noise + Existing) (dBA)
Impact to Residential Uses
Agricultural Receptor
Distance from the Center of Construction Activity to a Receptor (ft)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses

Distance Divergence (dBA)

\*Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level (dBA)

Residential

Normally Acceptable 60 Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 4200

Source: Google Earth

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

Table L-4. 8-Hour Construction Noise Level at the Receptor (dBA)												Е	stimat	ed Du	ıratior	ı, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	88	94	94	97	96	96	93	96	96	92	90	90	93	92	92	93	92	91	92	87	83	85	87	87	86	86	87	80
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)			690				690										690	690	690						690	690	690	690
Distance Divergence (dBA)	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8
Atmospheric Attenuation (dBA)	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
1-Hour Construction Noise Level at the Receptor (dBA)	64	71	71	74	73	73	70	73	73	69	66	67	69	68	69	69	68	68	69	64	59	62	63	63	63	63	64	57
CNEL (Construction Noise + Existing) (dBA)	62	67	68	70	69	69	66	69	69	65	63	64	66	65	65	66	65	65	65	61	59	60	61	61	61	61	61	58
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	CA	CA	CA	NA												
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Distance Divergence (dBA)	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
Atmospheric Attenuation (dBA)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
1-Hour Construction Noise Level at the Receptor (dBA)	74	81	81	84	83	82	80	83	83	79	76	77	79	78	78	79	78	78	79	74	69	72	73	73	73	73	74	67
CNEL (Construction Noise + Existing) (dBA)	71	77	77	80	79	79	76	79	79	75	72	73	75	75	75	75	75	74	75	70	66	68	70	70	69	69	70	64
Impact to Agricultural Uses	NA	CA	NA	NA	NA	CA	NA	NA	CA	NA																		

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level (dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors

Nearest residential receptor (ft) 4200

Source: Google Earth

Table L-5. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
02 - Relocations	The first part of the first pa	T dala 31			1 1 1 7 2 1 1	1 1	(3)	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	3.5 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	0.8 CY Loader/Backhoe, Wheel (1)	Backhoe	40%	78	74	1	0	74
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
3 3 ( )	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals	· · · · · · · · · · · · · · · · · · ·	T. Total	1 10 / 0			_	-	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	28	14	84
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
ordaning and ordaning	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1 1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1 1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1 1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
Excavation (vvet Conditions)	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75 75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
Excavation/Grading (Dry Conditions)	21 CY Scrapers (4)		40%	84	80	4	6	86
	12' Blade Grader (1)	Scraper Grader	40%	85	81	4	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1 1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Earthen Backfill	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
Earther Dackiii	4000 Gal Water Truck (1)		40%					1
	` '	Dump Truck		76	72 72		0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
Dinger Class 2	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77 70	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 5	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75 70	71	5	7	78
D: 01 0	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86

Table L-5. 8-Hour Construction No	pise Level at 50 Feet (dBA)												E	Stim	ated D	uratio	n, We	ek											
																													ī
Phase	Favrings and December 11-1-		_	_	_	_ ا	_	_			40		,,	1	1	,-	,,	,_	4.0	,,						25	20	27	-
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations	Term term to the state of the s						1		T	T					<u> </u>	1	<u> </u>		1	1		T		<u> </u>	T				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																											, ,	
	Extended Boom Pallet Loader (1)																											, ,	
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																											ļ	I
	3.5 CY Front End Loader, Wheel (1)																											ļ	I
	0.8 CY Loader/Backhoe, Wheel (1)																											ļ	I
	4000 Gal Water Truck (1)																											ļ	I
	16 CY 3 Axle Dump Truck (1)																											ļ	I
	Pickup Truck Conventional (6)																											ļ	I
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												i
	Pickup Truck Conventional (1)																												i
	16 CY 3 Axle Dump Truck (5)																												i
Temporary Electrical Power	Flatbed Truck (1)																											·	
,	Pickup Truck Conventional (2)																											ļ	I
09 - Channels and Canals	i ionap i i aon como mana (2)																												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)													Т		1	1												
Woomization and Demobilization	Extended Boom Pallet Loader (1)																											ļ	I
	Pickup Truck Conventional (1)																											ļ	I
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)													+	+														
Clearing and Grubbing																												ļ	I
	Trailer Mounted Brush Chipper (1)																											ļ	I
	Chainsaw (1)																											ļ	I
	4000 Gal Water Truck (1)																											ļ	I
	Pickup Truck Conventional (6)																											ļ	I
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																											ļ	I
	300 HP Dozer (2)																											ļ	I
	3.5 CY Front End Loader, Wheel (2)																											ļ	I
	16 CY 3 Axle Dump Truck (9)																											ļ	I
	Pickup Truck Conventional (7)																											ļ	
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																											ļ	I
	12' Blade Grader (1)																											ļ	I
	4000 Gal Water Truck (1)																											ļ	I
	Pickup Truck Conventional (7)																											ļ	I
Earthen Backfill	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																											ļ	I
	10 TN Smooth Roller (1)																											ļ	I
	Pickup Truck Conventional (3)																											ļ	ı
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
-	300 HP Dozer Crawler (1)																												I
	Pickup Truck Conventional (5)																											 	I
	16 CY 3 Axle Dump Trucks (23)																											ļ	ı
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	+	+											+															
Nipiap - Class 3		1																										ļ	I
	300 HP Dozer Crawler (1)	1																										ļ	I
	Pickup Truck Conventional (5)	1																										ļ	I
	16 CY 3 Axle Dump Trucks (23)																											<u> </u>	ı

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
The Bodding Material	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
Liosion control deeding	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
15 - Floodway Control and Diversion Struc		Tickup Truck	70 /0	73	/ 1		U U	11
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	14	11	81
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75 75	73		0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94		0	94
(Temporary Conerdam)	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	78	1	0	78
Construction Site Dewatering (Fumping)	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
Excavation (wet Conditions)	300 HP Dozer (2)	Dozer	40%	82	77 78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	79 76	75 72	9	10	82
	Pickup Truck Conventional (7)	Pickup Truck	40%	76 75	71	7	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	71	1	0	79
Sileet File Wall	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%		94	1 1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	101 75	94 71	6	8	79
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	<u> </u>	-	81	73	1	0	73
Headworks Structure Concrete Piles	•	Crane	16% 20%		77	1 1	0	77
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	1	84		1	_	
	Concrete Pump Boom Truck Mounted (1) Concrete Mixer Truck (3)	Concrete Pump Truck Concrete Mixer Truck	20% 40%	81 79	74 75	3	0 5	74
		Backhoe	40%		75 74	) 1		80 74
	0.8 CY Backhoe Loader (1)			78 70			0	1
	24 TN Truck End Dump (2)	Dump Truck	40%	76 75	72	2	3	75
Harada Otasataa	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73 75	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79 75	75 74	2 7	3	78
Handrada Ohanal Tarasitian	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71		8	79
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79 75	75	2	3	78
Library d Dattern Cata	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	/3	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1 1	0	70
OO Deeds Dellaseds and Deldase	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
08 - Roads, Railroads, and Bridges		Elet Ded Tarrels	100/	7.4	70		7	77
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74 70	70 75	5	/	77 75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79 75	75 74	1	0	75 74
Dadastrian Dridge Oscillato Dilet	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77		0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74 75	1	0	74
	Cocnrete Mixer Truck (3)	Concrete Mixer Truck	40%	79 70	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78 70	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76 75	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80

		 				_							
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)												
	300 HP Dozer Crawler (1)												
	Pickup Truck Conventional (5)												
	16 CY 3 Axle Haul Trucks (23)												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)												
	Pickup Truck Conventional (4)												
15 - Floodway Control and Diversion Struc		 						 					
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Construction Site Dewatering	Flatbed Truck (1)												
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)												
	Pickup Truck Conventional (3)												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)												
, ,	300 HP Dozer (2)												
	3.5 CY Front End Loader, Wheel (2)												
	16 CY 3 Axle Dump Truck (9)												
	Pickup Truck Conventional (7)												
Sheet Pile Wall	Flatbed Truck (1)												
	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)												
	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Concrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												
Headworks Structure	Concrete Pump Boom Truck Mounted (1)												
Tieadworks Structure	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (7)												
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)												
Headworks Charmer Transition	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (6)												
Hinged Bottom Gates													
Hinged Bollom Gales	90 TN Truck Mounted Hydraulic Crane (1)												
	Haul Truck Oversize Transport (1)												
00 Doods Dailroads and Dridges	Pickup Truck Conventional (4)												
08 - Roads, Railroads, and Bridges	Clath ad Turals (4 man piago of agricument)	T	T	<u> </u>	T T	1	T I			Т		T	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												
Dadastrian Bridge Consents Biles	Pickup Truck Conventional (1)												
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)												
	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Cocnrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
•	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
•	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
19 - Buildings, Grounds, and Utilities								
	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad	165 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79	75	1	0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
1 1	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Communication Equipment	Pickup Truck Conventional (3)			75	71	3	5	76

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)									
and Wingwalls	2.5" Dia. Concrete Vibrator (1)									
	Concrete Mixer Truck (2)									
	Pickup Truck Conventional (7)									
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)									
	Flatbed Truck (2)									
	Pickup Truck Conventional (5)									
19 - Buildings, Grounds, and Utilities				·		·		•		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (1)									
CMU Building and Earthwork Pad	165 HP Dozer (1)									
Construction	Scraper (1)									
	Motor Grader (1)									
	Compactor (1)									
	4000 Gal Water Truck (1)									
	10 TN Smooth Roller (1)									
	Pickup Truck Conventional (7)									
	Concrete Pump Boom Truck Mounted (1)									
	2.5" Dia. Concrete Vibrator (1)									
	Extended Boom Pallet Loader (1)									
	Concrete Mixer Truck (1)									
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)									
	2.5" Dia. Concrete Vibrator (1)									
	Concrete Mixer Truck (2)									
	Pickup Truck Conventional (7)									
20 -Permanent Operating Equipment								 ,		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (1)									
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (3)									
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (3)									
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)									
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)									
Communication Equipment	Pickup Truck Conventional (3)									

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

#### Table L- 6. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'	
esidential Receptor	Residentia
Distance from the Center of Construction Activity to a Receptor (ft)	
Distance Divergence (dBA)	
Atmospheric Attenuation (dBA)	
1-Hour Construction Noise Level at the Receptor (dBA)	
CNEL (Construction Noise + Existing) (dBA)	
Impact to Residential Uses	

### **Agricultural Receptor**

Distance from the Center of Construction Activity to a Receptor (ft) Distance Divergence (dBA) Atmospheric Attenuation (dBA) 1-Hour Construction Noise Level at the Receptor (dBA) CNEL (Construction Noise + Existing) (dBA) Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60 Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

**Background Noise** (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L- 6. 8-Hour Construction Noise Level at the Receptor (dBA)												E	stimat	ed Du	ıratior	ո, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	88	94	94	97	96	96	93	96	96	92	92	93	94	94	92	93	92	91	93	92	89	90	87	87	86	86	87	80
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)								700								700						700		700				
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)		0.58	0.58	0.58	0.58	0.58	0.58	0.58		0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
1-Hour Construction Noise Level at the Receptor (dBA)	64	71	71	73	73	72	70	73	73	69	69	70	70	71	68	69	68	68	70	69	65	66	63	63	63	63	64	57
CNEL (Construction Noise + Existing) (dBA)		67	67	70	69	69	66	69	69	66	66	67	67	67	65	66	65	65	66	66	63	63	61	61	61	61	61	58
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA												
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)													230						230		230			230				
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
1-Hour Construction Noise Level at the Receptor (dBA)	74	81	81	84	83	82	80	83	83	79	79	80	80	81	78	79	78	78	80	79	75	76	73	73	73	73	74	67
CNEL (Construction Noise + Existing) (dBA)	71	77	77	80	79	79	76	79	79	75	75	76	77	77	75	75	75	74	76	75	72	72	70	70	69	69	70	64
Impact to Agricultural Uses	NA	CA	CA	NA	CA	NA	NA	CA	CA	NA	NA	NA	NA	NA	NA I	NA I	NA											

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

Table L-7. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	
02 - Relocations	<u> </u>	1			К / -		, ,	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	3.5 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	0.8 CY Loader/Backhoe, Wheel (1)	Backhoe	40%	78	74	1	0	74
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
,	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals								<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	28	14	84
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
,	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
3 ( )	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1 1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Earthen Backfill	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1 1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1 1	0	73
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
1 -1 -1	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	, 14	86
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
pp	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	76	5	7	78
	I lovah Hack collingillar (2)	I lovah Hack	4070	I 13	l ''	l 0	,	1 10

Table L-7. 8-Hour Construction No	ise Level at 50 Feet (dBA)												E	stima	ated D	uratio	n, We	ek											
																													_ <del></del>
		_	١.		١.	l _	_	l _	_				١		١	_ ا	١	l l		١		١							
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations				I	ı	ı	1	ı	ı				1	ı	<del>                                     </del>	Τ	ı			I	ı	<del>                                     </del>	<del>                                     </del>	T	1				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												I
	4000 Gal Water Truck (1)																												İ
	16 CY 3 Axle Dump Truck (1)																												İ
	Pickup Truck Conventional (6)																												<u></u>
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												1
	4000 Gal Water Truck (1)																												ı
	Pickup Truck Conventional (1)																												ı
Tampagan, Flactrical Davier	16 CY 3 Axle Dump Truck (5)																			-			+						
Temporary Electrical Power	Flatbed Truck (1) Pickup Truck Conventional (2)																												İ
09 - Channels and Canals	Tickup Truck Conventional (2)																												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)														Τ								Τ						
INODITIZATION AND DEMODITIZATION	Extended Boom Pallet Loader (1)																												İ
	Pickup Truck Conventional (1)																												İ
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												İ
	Chainsaw (1)																												İ
	4000 Gal Water Truck (1)																												İ
	Pickup Truck Conventional (6)																												I
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												I
	300 HP Dozer (2)																												İ
	3.5 CY Front End Loader, Wheel (2)																												İ
	16 CY 3 Axle Dump Truck (9)																												I
Francisco (One die e (Dee One distant)	Pickup Truck Conventional (7)	<u> </u>																											
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												İ
	21 CY Scrapers (4) 12' Blade Grader (1)																												I
	4000 Gal Water Truck (1)																												İ
	Pickup Truck Conventional (7)																												İ
Earthen Backfill	300 HP Dozer (1)	1																											
	4000 Gal Water Truck (1)																												İ
	10 TN Smooth Roller (1)																												İ
	Pickup Truck Conventional (3)																												l
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												l
	Pickup Truck Conventional (5)																												l
	16 CY 3 Axle Dump Trucks (23)																												
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)																												- I
	300 HP Dozer Crawler (1)																												l
	Pickup Truck Conventional (5)																												l
	16 CY 3 Axle Dump Trucks (23)																												İ

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
Their Bodding Material	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
Liosion control deeding	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
15 - Floodway Control and Diversion Struc		Tickup Truck	70 /0	73	/ 1		<u> </u>	11
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	14	11	81
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75 75	73		0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94		0	94
(Temporary Conerdam)	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	71	1	0	78
Construction Site Dewatering (Pumping)	. •	1 -	40%			l '	_	76
Frequeties (Met Conditions)	Pickup Truck Conventional (3)	Pickup Truck	-	75 81	71 77	3 1	5 0	77
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator Dozer	40% 40%	l	77 78	2	_	81
	300 HP Dozer (2)		1	82			3	1
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79 70	75 70	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76 75	72	9	10	82
Ob a st Dila Wall	Pickup Truck Conventional (7)	Pickup Truck	40%	75 74	71	7	8	79 70
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%		70	1	0	
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
11 1 1 0: 1 0 1 1	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Concrete Mixer Truck (3)	Concrete Mixer Truck	40%	79 70	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	5	7	77
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Cocnrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80

DOD D. 111 . 14 . 1 . 1	[a = a)(11 1 11 = 1 (a)											1
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)											
	300 HP Dozer Crawler (1)											
	Pickup Truck Conventional (5)											
	16 CY 3 Axle Haul Trucks (23)											
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)											
	Pickup Truck Conventional (4)											
15 - Floodway Control and Diversion Struct						 					_	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Construction Site Dewatering	Flatbed Truck (1)											
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)											
	Pickup Truck Conventional (6)											
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)											
	Pickup Truck Conventional (3)											
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)											
, , ,	300 HP Dozer (2)											
	3.5 CY Front End Loader, Wheel (2)											
	16 CY 3 Axle Dump Truck (9)											
	Pickup Truck Conventional (7)											
Sheet Pile Wall	Flatbed Truck (1)											
	75 TN Crane Crawler Pile Hammer (1)											
	Pickup Truck Conventional (6)											
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)											
	100 FT Auger Track Mounted Drill Rig (1)											
	Concrete Pump Boom Truck Mounted (1)											
	Concrete Mixer Truck (3)											
	0.8 CY Backhoe Loader (1)											
	24 TN Truck End Dump (2)											
	Pickup Truck Conventional (8)											
Headworks Structure	Concrete Pump Boom Truck Mounted (1)											
Tieauworks Structure	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
Headwarks Channel Transition	Pickup Truck Conventional (7) 2.5" Dia. Concrete Vibrator (1)											
Headworks Channel Transition	` '											
	Concrete Mixer Truck (2)											
15 15 5	Pickup Truck Conventional (6)											
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)											
	Haul Truck Oversize Transport (1)											
00 D   D	Pickup Truck Conventional (4)											
08 - Roads, Railroads, and Bridges		 	<u> </u>		 1			<u> </u>	I I	<u> </u>		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)											
	100 FT Auger Track Mounted Drill Rig (1)											
	Concrete Pump Boom Truck Mounted (1)											
	Cocnrete Mixer Truck (3)											
	0.8 CY Backhoe Loader (1)											
	24 TN Truck End Dump (2)											
	Pickup Truck Conventional (8)											

Dadaatrian Bridge Constate Abutanasta	Congrete Dump Doors Trust Mauris d (4)	Congrete Duner Trust	200/	0.4	74	4	^	74
_	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74 70	1 1	0	74
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75 	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
19 - Buildings, Grounds, and Utilities			<u>,                                     </u>					,
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad Construc	` '	Dozer	40%	82	78	1	0	78
	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79	75	1	0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
20 -Permanent Operating Equipment	, ,	·						<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
incondition in juraline by interest at housing	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Electrical Control Equipment CMU Building		Pickup Truck	40%	75	71	3	5	76
Electrical Power Equipment CMU Building		Pickup Truck	40%	75	71	3	5	76
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Course UDD 2017 Vale Burges Colmonia			1070	, 0	, ,	, J	J	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

De de striere Dridere Occasionte Abertas ante	Oversets During Dears Trivels Manufact (4)	
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	
	Concrete Mixer Truck (2)	
	Pickup Truck Conventional (7)	
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	
	Flatbed Truck (2)	
	Pickup Truck Conventional (5)	
19 - Buildings, Grounds, and Utilities		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	
	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (1)	
CMU Building and Earthwork Pad Construction	truct 165 HP Dozer (1)	
	Scraper (1)	
	Motor Grader (1)	
	Compactor (1)	
	4000 Gal Water Truck (1)	
	10 TN Smooth Roller (1)	
	Pickup Truck Conventional (7)	
	Concrete Pump Boom Truck Mounted (1)	
	2.5" Dia. Concrete Vibrator (1)	
	Extended Boom Pallet Loader (1)	
	Concrete Mixer Truck (1)	
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	
	2.5" Dia. Concrete Vibrator (1)	
	Concrete Mixer Truck (2)	
	Pickup Truck Conventional (7)	
20 -Permanent Operating Equipment	The state of the s	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	
The sine and Bernesmeater	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (1)	
Mechanical Hydraulic Cylinders & Housing		
Weenanical rigardune Cymraers & riousing	Pickup Truck Conventional (3)	
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	
Civio Building Mechanical Equipment	Pickup Truck Conventional (3)	
Electrical Control Equipment CMU Building		
Electrical Power Equipment CMU Building		
Communication Equipment	Pickup Truck Conventional (3)	
	Prickup Truck Conventional (3)	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

### Table L-8. 8-Hour Construction Noise Level at the Receptor (dBA)

	Total Construction Leq(h) @ 50'
Residential Recep	otor
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour Construction Noise Level at the Receptor (dBA)
	CNEL (Construction Noise + Existing) (dBA)
	Impact to Residential Uses

### **Agricultural Receptor**

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60 Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-8. 8-Hour Construction Noise Level at the Receptor (dBA)												Е	stimat	ed Du	ıratioı	າ, Wee	ek											ı
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	88	94	94	97	96	96	93	96	96	92	92	93	94	94	92	93	92	91	93	92	89	90	87	87	86	86	87	80
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)			700		700								700					700						700			700	
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
1-Hour Construction Noise Level at the Receptor (dBA)	64	71	71	73	73	72	70	73	73	69	69	70	70	71	68	69	68	68	70	69	65	66	63	63	63	63	64	57
CNEL (Construction Noise + Existing) (dBA)	62	67	67	70	69	69	66	69	69	66	66	67	67	67	65	66	65	65	66	66	63	63	61	61	61	61	61	58
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	230												230				230		230	230	230	230	230	230	230	230	230	230
Distance Divergence (dBA)	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
Atmospheric Attenuation (dBA)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
1-Hour Construction Noise Level at the Receptor (dBA)	74	81	81	84	83	82	80	83	83	79	79	80	80	81	78	79	78	78	80	79	75	76	73	73	73	73	74	67
CNEL (Construction Noise + Existing) (dBA)	71	77	77	80	79	79	76	79	79	75	75	76	77	77	75	75	75	74	76	75	72	72	70	70	69	69	70	64
Impact to Agricultural Uses	NA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	NA	NA	CA	CA	NA	NA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

700

Receptors:

Nearest residential receptor (ft)

Table L-9. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
02 - Relocations								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	3.5 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	0.8 CY Loader/Backhoe, Wheel (1)	Backhoe	40%	78	74	1	0	74
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals		·	•					
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	23	14	84
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
(	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
Dodding Material	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	l ő	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	76	75	1	0	75
Liosion Control Seeding		•				1 :		
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77

Table L-9. 8-Hour Construction N	oise Level at 50 Feet (dBA)												E	stima	ted D	uratio	n, We	ek											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations	<u> </u>											•					•	•											
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																												
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Haul Trucks (23)																												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												
	Pickup Truck Conventional (4)							1						I			1									1			

Table L-9. 8-Hour Construction No	ise Level at 50 Feet (dBA)					Estir	nated	Dura	tion, \	Neek				
Phase	Equipment Description	29	30	31	32	33	34	35	36	37	38	39	40	41
02 - Relocations			1	ı		ı				l		ı	l	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)													
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6)													
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5)													
Temporary Electrical Power	Flatbed Truck (1) Pickup Truck Conventional (2)													
09 - Channels and Canals														
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)													
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1) Trailer Mounted Brush Chipper (1) Chainsaw (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (6) 16 CY 3 Axle Dump Truck (1)													
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1) 300 HP Dozer (2) 3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axle Dump Truck (9) Pickup Truck Conventional (7)													
Excavation/Grading (Dry Conditions)	300 HP Dozer (1) 21 CY Scrapers (4) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (7)													
Riprap - Class 2	2.5 CY Hydraulic Excavators (2) 300 HP Dozer Crawler (1) Pickup Truck Conventional (5) 16 CY 3 Axle Dump Trucks (23)													
RSP Bedding Material	2.5 CY Hydraulic Excavators (2) 300 HP Dozer Crawler (1) Pickup Truck Conventional (5) 16 CY 3 Axle Haul Trucks (23)													
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)													

15 - Floodway Control and Diversion Struc	ctures							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	13	11	81
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
,	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	78	1	0	78
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	10	82
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Concrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
_	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	5	7	77
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

15 - Floodway Control and Diversion Struc	tures									
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (1)									
Construction Site Dewatering	Flatbed Truck (1)									
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)									
	Pickup Truck Conventional (6)									
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)									
	Pickup Truck Conventional (3)									
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)									
	300 HP Dozer (2)									
	3.5 CY Front End Loader, Wheel (2)									
	16 CY 3 Axle Dump Truck (9)									
	Pickup Truck Conventional (7)									
Sheet Pile Wall	Flatbed Truck (1)									
	75 TN Crane Crawler Pile Hammer (1)									
	Pickup Truck Conventional (6)									
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)									
	100 FT Auger Track Mounted Drill Rig (1)									
	Concrete Pump Boom Truck Mounted (1)									
	Concrete Mixer Truck (3)									
	0.8 CY Backhoe Loader (1)									
	24 TN Truck End Dump (2)									
	Pickup Truck Conventional (8)									
Headworks Structure	Concrete Pump Boom Truck Mounted (1)									
	2.5" Dia. Concrete Vibrator (1)									
	Concrete Mixer Truck (2)									
	Pickup Truck Conventional (7)									
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)									
	Flatbed Truck (2)									
	Pickup Truck Conventional (5)									
08 - Roads, Railroads, and Bridges										
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (1)									

15 - Floodway Control and Diversion Struc	tures							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							l
	Pickup Truck Conventional (1)							l
Construction Site Dewatering	Flatbed Truck (1)							
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)							1
	Pickup Truck Conventional (6)							
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)							
	Pickup Truck Conventional (3)							1
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)							
	300 HP Dozer (2)							1
	3.5 CY Front End Loader, Wheel (2)							1
	16 CY 3 Axle Dump Truck (9)							1
	Pickup Truck Conventional (7)							1
Sheet Pile Wall	Flatbed Truck (1)							
	75 TN Crane Crawler Pile Hammer (1)							1
	Pickup Truck Conventional (6)							
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)							
	100 FT Auger Track Mounted Drill Rig (1)							1
	Concrete Pump Boom Truck Mounted (1)							1
	Concrete Mixer Truck (3)							1
	0.8 CY Backhoe Loader (1)							1
	24 TN Truck End Dump (2)							1
	Pickup Truck Conventional (8)							
Headworks Structure	Concrete Pump Boom Truck Mounted (1)							1
	2.5" Dia. Concrete Vibrator (1)							1
	Concrete Mixer Truck (2)							1
	Pickup Truck Conventional (7)							
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)							
	Flatbed Truck (2)							1
	Pickup Truck Conventional (5)							
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							1

Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Cocnrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
19 - Buildings, Grounds, and Utilities			<u> </u>					<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad	165 HP Dozer (1)	Dozer	40%	82	78	1	0	78
Construction	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79	75	1	0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
Control Duot During	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
20 -Permanent Operating Equipment	rickap Track Conventional (1)	I long Hack	1070	, 0		·	_	1 . 0
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
THOSHIZATION AND DOMODIIIZATION	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75		0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75 75	73	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
Sind float Frydraulio Cylinders & Floating	Pickup Truck Conventional (3)	Pickup Truck	40%	75 75	71	3	5	76
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
Sine Ballaring Modriariloar Equipment	Pickup Truck Conventional (3)	Pickup Truck	40%	75 75	71	3	5	76
Electrical Control Equipment CMU Building		Pickup Truck	40%	75 75	71	3	5	76
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)	Pickup Truck	40%	75 75	71	3	5	76
Communication Equipment	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Source: UDD 2017 Vole Punese Salmonie			70/0	10	, ,	<u> </u>		70

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

-		T
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	
	100 FT Auger Track Mounted Drill Rig (1)	
	Concrete Pump Boom Truck Mounted (1)	
	Cocnrete Mixer Truck (3)	
	0.8 CY Backhoe Loader (1)	
	24 TN Truck End Dump (2)	
	Pickup Truck Conventional (8)	
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	
	Concrete Mixer Truck (2)	
	Pickup Truck Conventional (7)	
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	
	Flatbed Truck (2)	
	Pickup Truck Conventional (5)	
19 - Buildings, Grounds, and Utilities		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	
	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (1)	
CMU Building and Earthwork Pad	165 HP Dozer (1)	
Construction	Scraper (1)	
	Motor Grader (1)	
	Compactor (1)	
	4000 Gal Water Truck (1)	
	10 TN Smooth Roller (1)	
	Pickup Truck Conventional (7)	
	Concrete Pump Boom Truck Mounted (1)	
	2.5" Dia. Concrete Vibrator (1)	
	Extended Boom Pallet Loader (1)	
	Concrete Mixer Truck (1)	
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	
	2.5" Dia. Concrete Vibrator (1)	
	Concrete Mixer Truck (2)	
	Pickup Truck Conventional (7)	
20 -Permanent Operating Equipment		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	
	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (1)	
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (3)	
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (3)	
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)	
Electrical Power Equipment CMU Building		
Communication Equipment	Pickup Truck Conventional (3)	
	id Habitat Postaration & Fish Postara Project	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

-	1							
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)							
	100 FT Auger Track Mounted Drill Rig (1)							
	Concrete Pump Boom Truck Mounted (1)							
	Cocnrete Mixer Truck (3)							
	0.8 CY Backhoe Loader (1)							
	24 TN Truck End Dump (2)							
	Pickup Truck Conventional (8)							
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)							
and Wingwalls	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)							
	Flatbed Truck (2)							
	Pickup Truck Conventional (5)							
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
CMU Building and Earthwork Pad	165 HP Dozer (1)							
Construction	Scraper (1)							
	Motor Grader (1)							
	Compactor (1)							
	4000 Gal Water Truck (1)							
	10 TN Smooth Roller (1)							
	Pickup Truck Conventional (7)							
	Concrete Pump Boom Truck Mounted (1)							
	2.5" Dia. Concrete Vibrator (1)							
	Extended Boom Pallet Loader (1)							
	Concrete Mixer Truck (1)							
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	1						
	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
20 -Permanent Operating Equipment	, , , , , , , , , , , , , , , , , , , ,							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
Mechanical Hydraulic Cylinders & Housing								
, , , , , , , , , , , , , , , , , , , ,	Pickup Truck Conventional (3)							
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (3)							
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)							
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)							
Communication Equipment	Pickup Truck Conventional (3)							
Communication Equipment	I ionap Truon Conventional (0)	<u> </u>				 l		

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

- Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Considerations. March 10.

### Table L-10. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'
Residential Receptor
Distance from the Center of Construction Activity to a Receptor (ft)
Distance Divergence (dBA)
Atmospheric Attenuation (dBA)
1-Hour Construction Noise Level at the Receptor (dBA)
CNEL (Construction Noise + Existing) (dBA)
Impact to Residential Uses
Agricultural Receptor
Distance from the Center of Construction Activity to a Receptor (ft)
Distance Divergence (dBA)
Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses
\*Distances are the minimum distances that can still achieve noise levels within
Conditionally Acceptable limits, except when there is a closer receptor.

(dBA)

Significance Level

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

3800

Receptors:

Nearest residential receptor (ft)

Table L-10. 8-Hour Construction Noise Level at the Receptor (dBA)												E	stimat	ed Du	ıratioı	ո, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	89	94	92	96	97	97	96	97	97	96	92	96	97	96	92	92	92	87	87	85	83	83	88	85	82	85	n/a	n/a
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)			720								720		720						720									
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
1-Hour Construction Noise Level at the Receptor (dBA)	65	70	68	73	74	73	72	73	73	73	69	72	73	73	68	68	68	63	63	61	59	59	64	61	59	62	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	62	67	65	69	70	70	69	69	70	69	65	69	69	69	65	65	65	61	61	60	59	59	62	60	59	60	n/a	n/a
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	NA	NA	CA	NA	NA	NA	n/a r	n/a
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
Distance Divergence (dBA)	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
Atmospheric Attenuation (dBA)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
1-Hour Construction Noise Level at the Receptor (dBA)	75	80	78	83	84	83	82	83	83	82	79	82	83	82	78	78	78	73	73	71	69	69	74	71	69	71	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	71	76	75	79	80	79	78	79	79	79	75	78	79	79	75	74	74	69	69	67	66	66	71	67	65	68	n/a	n/a
Impact to Agricultural Uses	NA	CA	NA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	n/a r	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 3800

Table L-10. 8-Hour Construction Noise Level at the Receptor (dBA)					Estir	mated	Dura	tion, V	Veek				
	29	30	31	32	33	34	35	36	37	38	39	40	41
Total Construction Leq(h) @ 50	84	86	86	86	86	86	86	86	86	87	85	84	n/a
Residential Receptor													
Distance from the Center of Construction Activity to a Receptor (ft)	720	720	720	720	720	720	720	720	720	720	720	720	720
Distance Divergence (dBA)	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
Atmospheric Attenuation (dBA)	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
1-Hour Construction Noise Level at the Receptor (dBA)	60	62	62	62	62	62	62	62	62	63	62	60	n/a
CNEL (Construction Noise + Existing) (dBA)	59	61	61	61	61	61	61	61	61	61	60	59	n/a
Impact to Residential Uses	NA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	n/a
Agricultural Receptor													
Distance from the Center of Construction Activity to a Receptor (ft)	240	240	240	240	240	240	240	240	240	240	240	240	240
Distance Divergence (dBA)	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
Atmospheric Attenuation (dBA)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
1-Hour Construction Noise Level at the Receptor (dBA)	70	72	72	72	72	72	72	72	72	73	72	70	n/a
CNEL (Construction Noise + Existing) (dBA)	67	69	69	69	69	69	69	69	69	69	68	67	n/a
Impact to Agricultural Uses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level (dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 3800

Table L-11. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
02 - Relocations			1. 0.010.			_qp	(0.2.1)	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	3.5 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	0.8 CY Loader/Backhoe, Wheel (1)	Backhoe	40%	78	74	1	0	74
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals	[	The state of the s	1 10 / 0				-	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	28	14	84
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1 1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
3	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1 1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
zhoaranen eraamig (z.) eenamene)	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Earthen Backfill	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
Larmon Backin	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1 1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73		0	73
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
11p14p 01400 2	300 HP Dozer Crawler (1)	Dozer	40%	82	77 78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	23	3	80
Tipiup - Olass o	300 HP Dozer Crawler (1)		40%	82		4		
		Dozer	1		78 71		0	78 79
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78

Table L-11. 8-Hour Construction N	Noise Level at 50 Feet (dBA)												Е	stima	ted Du	ıratioı	n, Wee	k											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations			_	_		_	_		_	1		1	ı	T	1							ı	ı	1	ı				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
5	Pickup Truck Conventional (1)									+																			
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)														ļ														
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
	16 CY 3 Axle Dump Truck (5)														ļ														
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals				1	T		<u> </u>	_	<u> </u>		1	T		T	T		ı ı	1	T			T	ı	T	1		T		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												ŀ
	Extended Boom Pallet Loader (1)																												ŀ
	Pickup Truck Conventional (1)																												1
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												ŀ
	Trailer Mounted Brush Chipper (1)																												ŀ
	Chainsaw (1)																												ŀ
	4000 Gal Water Truck (1)																												ŀ
	Pickup Truck Conventional (6)																												ŀ
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												ŀ
	300 HP Dozer (2)																												ŀ
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																												
Earthen Backfill	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
	Pickup Truck Conventional (3)																												
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)	1																											
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)	1																											
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	1																									T	T	
	300 HP Dozer Crawler (1)	1																											
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												1

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
Their Bodding Material	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
Liosion control deeding	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
15 - Floodway Control and Diversion Struc		Tickup Truck	70 /0	73	/ 1		<u> </u>	11
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	14	11	81
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75 75	73		0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94		0	94
(Temporary Conerdam)	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	71	1	0	78
Construction Site Dewatering (Pumping)	. •	1 -	40%			l '	_	76
Frequeties (Met Conditions)	Pickup Truck Conventional (3)	Pickup Truck	-	75 81	71 77	3 1	5 0	77
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator Dozer	40% 40%	l	77 78	2	_	81
	300 HP Dozer (2)		1	82			3	1
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79 70	75 70	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76 75	72	9	10	82
Ob a st Dila Wall	Pickup Truck Conventional (7)	Pickup Truck	40%	75 74	71	7	8	79 70
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%		70	1	0	
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
11 1 1 0: 1 0 1 1	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Concrete Mixer Truck (3)	Concrete Mixer Truck	40%	79 70	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	5	7	77
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Cocnrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80

	In a post of the second of the			_								1	
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)												
	300 HP Dozer Crawler (1)												
	Pickup Truck Conventional (5)												
	16 CY 3 Axle Haul Trucks (23)												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)												
	Pickup Truck Conventional (4)												
15 - Floodway Control and Diversion Struc					<u>,                                      </u>		 		 				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Construction Site Dewatering	Flatbed Truck (1)												
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)												
	Pickup Truck Conventional (3)												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)												
, , ,	300 HP Dozer (2)												
	3.5 CY Front End Loader, Wheel (2)												
	16 CY 3 Axle Dump Truck (9)		ï										
	Pickup Truck Conventional (7)		ï										
Sheet Pile Wall	Flatbed Truck (1)												$\neg$
	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)												
	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Concrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												
Headworks Structure	Concrete Pump Boom Truck Mounted (1)												-
	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (7)												
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)												$\overline{}$
Trodaworks orialinor transment	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (6)												
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)							+					-
Timged Bottom Gates	Haul Truck Oversize Transport (1)												
	Pickup Truck Conventional (4)												
08 - Roads, Railroads, and Bridges	Tickup Truck Conventional (4)												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)					_	T T						
Woomzation and Demoonization	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)			+									$\dashv$
Tredestrial bridge collete Files	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Cocnrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
_	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
•	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad	165 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79	75	1	0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Electrical Control Equipment CMU Building		Pickup Truck	40%	75	71	3	5	76
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Communication Equipment	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)								
and Wingwalls	2.5" Dia. Concrete Vibrator (1)								
and ringitano	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (7)								
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)								
	Flatbed Truck (2)								
	Pickup Truck Conventional (5)								
19 - Buildings, Grounds, and Utilities		'							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								
	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (1)								
CMU Building and Earthwork Pad	165 HP Dozer (1)								
Construction	Scraper (1)								
	Motor Grader (1)								
	Compactor (1)								
	4000 Gal Water Truck (1)								
	10 TN Smooth Roller (1)								
	Pickup Truck Conventional (7)								
	Concrete Pump Boom Truck Mounted (1)								
	2.5" Dia. Concrete Vibrator (1)								
	Extended Boom Pallet Loader (1)								
	Concrete Mixer Truck (1)								
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)								
	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (7)								
20 -Permanent Operating Equipment		<u>'</u>			,				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								
	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (1)								
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (3)								
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (3)								
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)								
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)								
Communication Equipment	Pickup Truck Conventional (3)								
<del></del>			 		 				

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

### Table L-12. 8-Hour Construction Noise Level at the Receptor (dBA)

	Total Construction Leq(h) @ 50'
Residential Recep	otor
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour Construction Noise Level at the Receptor (dBA)
	CNEL (Construction Noise + Existing) (dBA)
_	Impact to Residential Uses

### **Agricultural Receptor**

Distance from the Center of Construction Activity to a Receptor (ft) Distance Divergence (dBA) Atmospheric Attenuation (dBA) 1-Hour Construction Noise Level at the Receptor (dBA) CNEL (Construction Noise + Existing) (dBA) Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60 Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

**Background Noise** (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-12. 8-Hour Construction Noise Level at the Receptor (dBA)												Е	stimat	ed Du	ıratioı	ո, Wee	ek											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	88	94	97	97	93	93	96	96	91	91	94	94	94	95	94	94	94	94	94	95	94	90	90	89	86	86	87	86
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)			700		700								700				700							700			700	
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
1-Hour Construction Noise Level at the Receptor (dBA)	64	71	74	73	70	69	73	72	67	68	71	71	71	71	71	71	71	71	71	72	71	66	67	66	63	63	64	62
CNEL (Construction Noise + Existing) (dBA)	62	67	70	70	66	66	69	69	64	65	67	67	67	68	67	67	67	67	67	68	67	63	64	63	61	61	62	60
Impact to Residential Uses	CA	CA	S	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	230												230				230		230	230	230	230	230	230	230	230	230	230
Distance Divergence (dBA)	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
Atmospheric Attenuation (dBA)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
1-Hour Construction Noise Level at the Receptor (dBA)	74	81	84	84	80	79	83	82	77	78	81	81	81	81	81	81	81	81	81	82	81	76	77	76	73	73	74	72
CNEL (Construction Noise + Existing) (dBA)	71	77	80	80	76	75	79	79	73	74	77	77	77	77	77	77	77	77	77	78	77	72	73	72	69	69	70	69
Impact to Agricultural Uses	NA	CA	CA	CA	CA	CA	CA	CA	NA	NA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

# Construction Noise - Equipment Downstream (Alternatives 1-4, 6)

Table L-13. 8-Hour Construction Noise Level at 50 Feet (dBA)

Table L-13. 8-Hour Construction N	LOTO: AL OUT OUT (ALDIT)		Usage	Equipment	Equipment	Number of	Add to Single Source Level	Total Leq(h) @
Phase	Equipment Description	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
02 - Relocations								•
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	3	5	75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	19	13	83
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Earthen Backfill	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	l 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
3 222	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
g	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
11-Levees and Floodwalls	i ionap i iaon com omiona. (1)	. ionap . i aon	1070					<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	7	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1 1	0	71
Soil Cement Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
Com Comon Bontonito Outon Wall	300 HP Dozer (1)	Dozer	40%	82	78	1 1	0	78
	2.5 CY Hydraulic Excavators (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1 1	0	72
	Flash Mixer (1)	All Other Equipment > 5 hp	1	85	82		0	82
	Slurry Pump (1)	Pumps	50% 50%	81	78		Ĭ	78
		1 · ·	1				0 7	
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78

Pickup Truck Conventional (5)
Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

## **Construction Noise - Equipment** Downstream (Alternatives 1-4, 6)

Table L-13. 8-Hour Construction N	oise Level at 50 Feet (dBA)												E	stima	ted D	uratio	n, We	ek										
	·																											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26 27	7 28
02 - Relocations																								1				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																											
	Extended Boom Pallet Loader (1)																											
	Pickup Truck Conventional (1)																											
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																											
	4000 Gal Water Truck (1)																											
	Pickup Truck Conventional (1)																											
To an age of Florida at Danier	16 CY 3 Axle Dump Truck (5)																											
Temporary Electrical Power	Flatbed Truck (1)																											
OO Characle and Carale	Pickup Truck Conventional (2)																											
09 - Channels and Canals	Flothed Triple (4 nor piece of equipment)			ı	l l	1	T		ı	ı		1	1	T		1		Т	1	Т								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1)																											
	Pickup Truck Conventional (1)																											
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																										-+	+
Cleaning and Grubbing	Trailer Mounted Brush Chipper (1)																											
	Chainsaw (1)																											
	4000 Gal Water Truck (1)																											
	Pickup Truck Conventional (6)																											
	16 CY 3 Axle Dump Truck (1)																											
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																										-	-
Executation (vvet conditions)	300 HP Dozer (2)																											
	3.5 CY Front End Loader, Wheel (2)																											
	16 CY 3 Axle Dump Truck (9)																											
	Pickup Truck Conventional (7)																											
Earthen Backfill	300 HP Dozer (1)																											
	4000 Gal Water Truck (1)																											
	10 TN Smooth Roller (1)																											
	Pickup Truck Conventional (3)																											
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																											
	300 HP Dozer Crawler (1)																											
	Pickup Truck Conventional (5)																											
	16 CY 3 Axle Dump Trucks (23)																											
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)																											
	300 HP Dozer Crawler (1)																											
	Pickup Truck Conventional (5)																											
	16 CY 3 Axle Haul Trucks (23)																											
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																											
	Pickup Truck Conventional (4)																											
11-Levees and Floodwalls							_		_				_			_												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																											
	Extended Boom Pallet Loader (1)																											
Soil Cement Bentonite Cutoff Wall	Pickup Truck Conventional (1)	-																									$\longrightarrow$	
Soil Cernent Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)													l														
	300 HP Dozer (1)																											
	2.5 CY Hydraulic Excavators (1)																											
	16 CY 3 Axle Dump Truck (1)																											
	Flash Mixer (1)																											
	Slurry Pump (1)													l														
	Pickup Truck Conventional (5)	1																										

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

- Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Considerations. March 10.

## Construction Noise - Equipment Downstream (Alternatives 1-4, 6)

### Table L-14. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'
Residential Receptor
Distance from the Center of Construction Activity to a Receptor (ft)
Distance Divergence (dBA)
Atmospheric Attenuation (dBA)
1-Hour Construction Noise Level at the Receptor (dBA)
CNEL (Construction Noise + Existing) (dBA)
Impact to Residential Uses
Agricultural Receptor
Distance from the Center of Construction Activity to a Receptor (ft)
Distance Divergence (dBA)
Atmospheric Attenuation (dBA)
1-Hour Construction Noise Level at the Receptor (dBA)
CNEL (Construction Noise + Existing) (dBA)
Impact to Agricultural Uses

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 7000

## Construction Noise - Equipment Downstream (Alternatives 1-4, 6)

Table L-14. 8-Hour Construction Noise Level at the Receptor (dBA)												E	stimat	ed Du	uratio	n, Wee	ek											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	85	93	93	93	93	87	88	88	88	90	90	90	89	91	91	91	91	91	88	79	79	84	84	79	n/a	n/a	n/a	n/a
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
Distance Divergence (dBA)							18.7								18.7												18.7	
Atmospheric Attenuation (dBA)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
1-Hour Construction Noise Level at the Receptor (dBA)	66	73	73	73	73	68	69	69	69	71	71	71	69	72	72	72	72	72	69	60	60	65	65	60	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	63	70	70	70	70	64	65	65	65	67	67	67	66	68	68	68	68	68	65	59	59	62	62	59	n/a	n/a	n/a	n/a
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	NA	CA	CA	NA	n/a	n/a	n/a	n/a
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)		140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	
Distance Divergence (dBA)			8.9			8.9	8.9	8.9		8.9		8.9		8.9	8.9	8.9	8.9	8.9	8.9	8.9		8.9		8.9	8.9			8.9
Atmospheric Attenuation (dBA)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
1-Hour Construction Noise Level at the Receptor (dBA)	76	83	83	83	83	78	79	79	79	81	81	81	79	82	82	82	82	82	79	70	70	75	75	70	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	73	80	80	80	80	74	75	75	75	77	77	77	76	78	78	78	78	78	75	67	67	71	71	66	n/a	n/a	n/a	n/a
Impact to Agricultural Uses	NA	CA	CA	CA	CA	NA	NA	NA	NA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	NA	NA	NA	NA	NA	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 7000

Table L-15. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase 02 - Relocations Mobilization and Demobilization  Fremont Weir Demo  Levee O&M Road Regrading (6" AB)  Temporary Electrical Power 09 - Channels and Canals Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1) 3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Flat Bed Truck Front End Loader Pickup Truck Excavator Front End Loader Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Pickup Truck Pickup Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40% 40%	Fquipment Lmax @ 50'  74  79  75  81  79  78  76  76  75  85  76  75  75  75  76  74  75	Fquipment Leq(h) @ 50'  70  75  71  77  75  74  72  72  71  81  72  71  72  70  71	6 1 1 1 6 6 1 1 1 5 5 1 2	8 0 0 0 0 0 0 0 0 0 7 0 3	78 75 71 77 75 74 72 79 81 72 71 79 70 74
02 - Relocations  Mobilization and Demobilization  Fremont Weir Demo  Levee O&M Road Regrading (6" AB)  Temporary Electrical Power  09 - Channels and Canals	Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1) 3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Flat Bed Truck Front End Loader Pickup Truck Excavator Front End Loader Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Pickup Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40% 40%	74 79 75 81 79 78 76 76 75 85 76 75 76	70 75 71 77 75 74 72 72 71 81 72 71 72 70	6 1 1 1 1 1 1 1 6 1 1 1 5	8 0 0 0 0 0 0 0 0 8 0 0 0 0 0 7	78 75 71 77 75 74 72 72 79 81 72 71 79
Mobilization and Demobilization  Fremont Weir Demo  Levee O&M Road Regrading (6" AB)  Temporary Electrical Power  09 - Channels and Canals	Extended Boom Pallet Loader (1) Pickup Truck Conventional (1) 3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Front End Loader Pickup Truck Excavator Front End Loader Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Pickup Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40% 40%	79 75 81 79 78 76 76 75 85 76 75 76	75 71 77 75 74 72 72 71 81 72 71 72	1 1 1 1 1 1 1 6 1 1 1 5	0 0 0 0 0 0 0 8 0 0 0 0 7	75 71 77 75 74 72 72 79 81 72 71 79
Fremont Weir Demo  Levee O&M Road Regrading (6" AB)  Temporary Electrical Power  09 - Channels and Canals	Extended Boom Pallet Loader (1) Pickup Truck Conventional (1) 3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Front End Loader Pickup Truck Excavator Front End Loader Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Pickup Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40% 40%	79 75 81 79 78 76 76 75 85 76 75 76	75 71 77 75 74 72 72 71 81 72 71 72	1 1 1 1 1 1 1 6 1 1 1 5	0 0 0 0 0 0 0 8 0 0 0 0 7	75 71 77 75 74 72 72 79 81 72 71 79
Levee O&M Road Regrading (6" AB)  Temporary Electrical Power  09 - Channels and Canals	Pickup Truck Conventional (1)  3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6)  12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Pickup Truck Excavator Front End Loader Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Pickup Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40% 40%	75 81 79 78 76 76 75 85 76 75 76	71 77 75 74 72 72 71 81 72 71 72	1 1 1 1 1 1 6 1 1 1 5	0 0 0 0 0 0 0 8 0 0 0 0 7	71 77 75 74 72 72 79 81 72 71 79
Levee O&M Road Regrading (6" AB)  Temporary Electrical Power  09 - Channels and Canals	3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Excavator Front End Loader Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Pickup Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40% 40%	81 79 78 76 76 75 85 76 75 76	77 75 74 72 72 71 81 72 71 72	1 1 1 1 1 6 1 1 1 5	0 0 0 0 0 8 0 0 0 0 7	77 75 74 72 72 79 81 72 71 79
Levee O&M Road Regrading (6" AB)  Temporary Electrical Power  09 - Channels and Canals	3.5 CY Front End Loader, Wheel (1) 0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Front End Loader Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40%	79 78 76 76 75 85 76 75 76	75 74 72 72 71 81 72 71 72	1 1 1 1 6 1 1 1 5	0 0 0 0 8 0 0 0 7	75 74 72 72 79 81 72 71 79
Temporary Electrical Power  09 - Channels and Canals	0.8 CY Loader/Backhoe, Wheel (1) 4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Backhoe Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40% 40%	78 76 76 75 85 76 75 76	74 72 72 71 81 72 71 72 70	1 1 1 5	0 0 0 8 0 0 0 7	74 72 72 79 81 72 71 79
Temporary Electrical Power  09 - Channels and Canals	4000 Gal Water Truck (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6) 12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)	Dump Truck Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40% 40%	76 76 75 85 76 75 76	72 72 71 81 72 71 72 70	1 1 1 5	0 0 8 0 0 0 7	72 72 79 81 72 71 79
Temporary Electrical Power  09 - Channels and Canals	16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (6)  12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Dump Truck Pickup Truck Grader Dump Truck Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40%	76 75 85 76 75 76	72 71 81 72 71 72 70	1 1 1 5	0 8 0 0 0 7	72 79 81 72 71 79
Temporary Electrical Power  09 - Channels and Canals	Pickup Truck Conventional (6)  12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Pickup Truck Grader Dump Truck Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40% 40%	75 85 76 75 76 74	71 81 72 71 72 70	1 1 1 5	8 0 0 0 7	79 81 72 71 79
Temporary Electrical Power  09 - Channels and Canals	12' Blade Grader (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Grader Dump Truck Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40% 40%	85 76 75 76 74	81 72 71 72 70	1 1 1 5	0 0 0 7	81 72 71 79 70
Temporary Electrical Power  09 - Channels and Canals	4000 Gal Water Truck (1) Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Dump Truck Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40% 40%	76 75 76 74	72 71 72 70	1 1 5	0 0 7 0	72 71 79 70
09 - Channels and Canals	Pickup Truck Conventional (1) 16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Pickup Truck Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40% 40%	75 76 74	71 72 70	1	0 7 0	71 79 70
09 - Channels and Canals	16 CY 3 Axle Dump Truck (5) Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Dump Truck Flat Bed Truck Pickup Truck	40% 40% 40%	76 74	72 70	1	7 0	79 70
09 - Channels and Canals	Flatbed Truck (1) Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Flat Bed Truck Pickup Truck	40% 40%	74	70	1	0	70
09 - Channels and Canals	Pickup Truck Conventional (2)  Flatbed Truck (1 per piece of equipment)	Pickup Truck	40%					
	Flatbed Truck (1 per piece of equipment)	·		75	71	2	3	7/
		Flat Bed Truck	100/					14
Mobilization and Demobilization		Flat Bed Truck	400/					
			40%	74	70	23	14	84
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
Lission Control Seeding	Pickup Truck Conventional (4)	Pickup Truck	40%	75 75	73	4	6	77

Table L-15. 8-Hour Construction N	loise Level at 50 Feet (dBA)												E	stima	ted D	uratio	n, We	ek											
Di con	E. J A B J. at	١.			١.	_ ا			١.				1,0	1,0	۱.,	1,5			4.0	40									
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations	Flathard Touris (Amarasia and Amarasia)		_				T	T	T	I		T	T		I			I							l				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
B	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals			1		1	ı			T		1			1			1	ı	ı			1	1		1				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																												
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)	1																											
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)																										Ţ		
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)	1																											
	16 CY 3 Axle Haul Trucks (23)																												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												
	Pickup Truck Conventional (4)																												

15 - Floodway Control and Diversion Struct	ures							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	3	5	75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

15 - Floodway Control and Diversion Struct	ures									
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (1)									
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)									
	75 TN Crane Crawler Pile Hammer (1)									
	Pickup Truck Conventional (6)									
Sheet Pile Wall	Flatbed Truck (1)									
	75 TN Crane Crawler Pile Hammer (1)									
	Pickup Truck Conventional (6)									
Headworks Structure	Concrete Pump Boom Truck Mounted (1)									
	2.5" Dia. Concrete Vibrator (1)									
	Concrete Mixer Truck (2)									
	Pickup Truck Conventional (7)									
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)									
	Concrete Mixer Truck (2)									
	Pickup Truck Conventional (6)									
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)									
	Haul Truck Oversize Transport (1)									
	Pickup Truck Conventional (4)									
20 -Permanent Operating Equipment		·	<u> </u>							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)									
	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (1)									
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)									
	Pickup Truck Conventional (3)									

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

#### Table L-16. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'

Residential Receptor

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Residential Uses

### **Agricultural Receptor**

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

1800

Receptors:

Nearest residential receptor (ft)

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-16. 8-Hour Construction Noise Level at the Receptor (dBA)												Е	stimat	ted Du	ıratior	ո, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	81	83	84	93	87	88	91	79	86	94	94	83	84	79	80	79	78	78	79	n/a	n/a	n/a	n/a	n/a	n/a	n/a	84	80
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Distance Divergence (dBA)	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
Atmospheric Attenuation (dBA)	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
1-Hour Construction Noise Level at the Receptor (dBA)	49	51	52	60	54	56	58	47	53	62	62	50	51	46	48	46	46	46	46	n/a	n/a	n/a	n/a	n/a	n/a	n/a	51	48
CNEL (Construction Noise + Existing) (dBA)	56	57	57	59	57	57	58	56	57	60	60	57	57	56	56	56	56	56	56	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57	56
Impact to Residential Uses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	NA	NA
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)				170							170		170		170											170	170	170
Distance Divergence (dBA)	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Atmospheric Attenuation (dBA)	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
1-Hour Construction Noise Level at the Receptor (dBA)	71	73	74	82	76	78	80	68	75	83	83	72	73	68	69	68	68	68	68	n/a	n/a	n/a	n/a	n/a	n/a	n/a	73	69
CNEL (Construction Noise + Existing) (dBA)	67	69	70	78	72	74	76	65	71	80	80	69	69	65	66	65	65	65	65	n/a	n/a	n/a	n/a	n/a	n/a	n/a	69	66
Impact to Agricultural Uses	NA	NA	NA	CA	NA	NA	CA	NA	NA	CA	CA	NA	NA	NA	NA	NA	NA	NA	NA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 1800

Table L-17. 8-Hour Construction Noise Level at 50 Feet (dBA)

Dhace	Equipment Decements	DOMM Equipment Toward	Usage		Equipment	Number of	Add to Single Source Level	Leq(h) @
Phase	Equipment Description	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
02 - Relocations	Clath ad Touris (4 and also at a suit or and)	TELANDO A Tarrata	1 400/	7.4	70		0	T 70
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74 79	70 75	6	8	78 75
	Extended Boom Pallet Loader (1)	Front End Loader	40%			1 1	0	75 74
Fremont Weir Demo	Pickup Truck Conventional (1)	Pickup Truck	40%	75 81	71 77	1	0	71 77
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1) 3.5 CY Front End Loader, Wheel (1)	Excavator Front End Loader	40% 40%	79	77 75	1 1	0	77
	0.8 CY Loader/Backhoe, Wheel (1)	Backhoe	40%	79 78	75 74		0	74
	4000 Gal Water Truck (1)	Dump Truck	40%	76 76	74 72		0	72
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76 76	72 72		0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	76 75	71	6	8	79
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Levee Oxivi Road Regrading (6 AB)	4000 Gal Water Truck (1)	Dump Truck	40%	76	72		0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	76 75	71		0	71
	• • • • • • • • • • • • • • • • • • • •	Dump Truck	40%	76	72	5	7	79
Tomporary Floatrical Power		Flat Bed Truck	40%	74	70	1	0	79
Temporary Electrical Fower			40%	74 75	70 71	2	3	74
09 - Channels and Canals	y Electrical Power Flatbed Truck (1) Flat Pickup Truck Conventional (2) Pickup Truck Conventional (2)		70 /0	13	/ 1			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	23	14	84
Widdingation and Demodifization	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71		0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
Oleaning and Grabbing	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92		0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
3 ( )	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
ŭ	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Haul Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
· · <del>- · · · ·</del>	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77

Table L-17. 8-Hour Construction N	loise Level at 50 Feet (dBA)												E	stima	ted Du	ıratior	ո, Wed	ek							, .				
Í																													l
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations				<u> </u>	<u> </u>						<u> </u>		<u> </u>		<u> </u>			<u> </u>											
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												1
	0.8 CY Loader/Backhoe, Wheel (1)																												1
	4000 Gal Water Truck (1)																												1
	16 CY 3 Axle Dump Truck (1)																												1
	Pickup Truck Conventional (6)																												1
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												ı
	Pickup Truck Conventional (1)																												ı
	16 CY 3 Axle Dump Truck (5)																												ı
Temporary Electrical Power	Flatbed Truck (1)																												1
	Pickup Truck Conventional (2)																												
09 - Channels and Canals																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												1
	Extended Boom Pallet Loader (1)																												1
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												1
	Chainsaw (1)																												1
	4000 Gal Water Truck (1)																												1
	Pickup Truck Conventional (6)																												1
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												1
	300 HP Dozer (2)																												1
	3.5 CY Front End Loader, Wheel (2)																												1
	16 CY 3 Axle Dump Truck (9)																												1
	Pickup Truck Conventional (7)																												<b>—</b>
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												1
	21 CY Scrapers (4)																												1
	12' Blade Grader (1)																												1
	4000 Gal Water Truck (1)																												1
D: 01 0	Pickup Truck Conventional (7)	ļ				+																							<del></del>
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)																												1
	300 HP Dozer Crawler (1)																												1
	Pickup Truck Conventional (5)																												1
	16 CY 3 Axle Dump Trucks (23)					1	1																						<del></del>
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)																												1
	300 HP Dozer Crawler (1)																												1
	Pickup Truck Conventional (5)																												1
	16 CY 3 Axle Haul Trucks (23)	<u> </u>				1	1																						—
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												1
	Pickup Truck Conventional (4)																												

15 - Floodway Control and Diversion Struct	ures							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	6	8	78
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	3	5	75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

15 - Floodway Control and Diversion Struct	ures								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								
	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (1)								
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)								
	75 TN Crane Crawler Pile Hammer (1)								
	Pickup Truck Conventional (6)								
Sheet Pile Wall	Flatbed Truck (1)								
	75 TN Crane Crawler Pile Hammer (1)								
	Pickup Truck Conventional (6)								
Headworks Structure	Concrete Pump Boom Truck Mounted (1)								
	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (7)								
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (6)								
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)								
	Haul Truck Oversize Transport (1)								
	Pickup Truck Conventional (4)								
20 -Permanent Operating Equipment									
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								
	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (1)								
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (3)								

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

#### Table L-18. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'

Residential Receptor

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Residential Uses

**Agricultural Receptor** 

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses

\*Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 8600

Table L-18. 8-Hour Construction Noise Level at the Receptor (dBA)												E	stimat	ed Du	ıratior	, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	81	83	84	93	87	88	91	79	86	94	94	83	84	79	80	79	78	78	79	n/a	n/a	n/a	n/a	n/a	n/a	n/a	84	80
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)				510					510		510							510		510								510
Distance Divergence (dBA)	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2
Atmospheric Attenuation (dBA)		0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
1-Hour Construction Noise Level at the Receptor (dBA)		63	64	72	66	68	70	59	65	74	74	62	63	58	60	58	58	58	58	n/a	n/a	n/a	n/a	n/a	n/a	n/a	63	60
CNEL (Construction Noise + Existing) (dBA)	60	61	61	68	63	65	67	58	63	70	70	60	61	58	59	58	58	58	58	n/a	n/a	n/a	n/a	n/a	n/a	n/a	61	59
Impact to Residential Uses	NA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	CA	CA	NA	NA	NA	NA	NA	NA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	CA	NA
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)			170								170				170								170					
Distance Divergence (dBA)	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Atmospheric Attenuation (dBA)	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
1-Hour Construction Noise Level at the Receptor (dBA)	71	73	74	82	76	78	80	68	75	83	83	72	73	68	69	68	68	68	68	n/a	n/a	n/a	n/a	n/a	n/a	n/a	73	69
CNEL (Construction Noise + Existing) (dBA)	67	69	70	78	72	74	76	65	71	80	80	69	69	65	66	65	65	65	65	n/a	n/a	n/a	n/a	n/a	n/a	n/a	69	66
Impact to Agricultural Uses	NA	NA	NA	CA	NA	NA	CA	NA	NA	CA	CA	NA	NA	NA	NA	NA	NA	NA	NA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) 8600

Table L-19. 8-Hour Construction Noise Level at 50 Feet (dBA)

Table L-19. 8-Hour Construction No  Phase	Equipment Description	RCNM Equipment Types	Usage Factor		Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
02 - Relocations	<u> </u>						, ,	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	3	5	75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	11	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	9	81
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
11 - Levees and Flood walls								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Reinforced AG Berm	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
15 - Floodway Control and Diversion Stru								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	12	11	81
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	78	1	0	78
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	300 HP Dozer (2)	Dozer	40%	82	78	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	10	82
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79

Table L-19. 8-Hour Construction No	ise Level at 50 Feet (dBA)		1		r			1		_	,		E	stima	ated D	uratio	n, We	ek	,	1	1	·							
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations		-						<u> </u>						1	1	1	1 .*	_ · ·			1	1			<u> </u>				Ť
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																										$\neg$	$\overline{}$	
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																										-	$\rightarrow$	
zoros com ricas ricgraumig (o riz)	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)																										$\overline{}$	$\rightarrow$	
. ,	Pickup Truck Conventional (2)																												
09 - Channels and Canals																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												
	Pickup Truck Conventional (4)																												
11 - Levees and Flood walls																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (3)																												
Reinforced AG Berm	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
	Pickup Truck Conventional (3)																												
15 - Floodway Control and Diversion Struc																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)																												
	Pickup Truck Conventional (3)	<del>                                     </del>																											
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												

Concrete Turnout Structure	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
Concrete Turnout Structure	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1 1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75 75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	79 75	75 71	7	8	79
36-Inch RCP	25 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
30-Inch RCP		Flat Bed Truck	40%	74	73 70	1 1	0	70
	Flatbed Truck (1) Pickup Truck Conventional (4)	Pickup Truck	40%	74 75	70 71	4	6	77
Trashrack	Flatbed Truck (1)	Flat Bed Truck	40%	75 74	71	1	0	70
Trasmack	. ,					1		70
Screw Gate	Pickup Truck Conventional (2)	Pickup Truck Flat Bed Truck	40% 40%	75 74	71 70	2 1	3	70
Screw Gate	Flatbed Truck (1)	=	1				1	1
0.4.5.1.0	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Outlet Fish Screen	Flatbed Truck (1)	Flat Bed Truck	40%	74 75	70	1	0	70
0 1 5	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Concrete Emergency Spillway	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Concrete Connection Vault	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
08 - Roads, Railroads, and Bridges								<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	5	7	77
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	100 FT Auger Track Mounted Drill Rig (1)	Auger Drill Rig	20%	84	77	1	0	77
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	Cocnrete Mixer Truck (3)	Concrete Mixer Truck	40%	79	75	3	5	80
	0.8 CY Backhoe Loader (1)	Backhoe	40%	78	74	1	0	74
	24 TN Truck End Dump (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (8)	Pickup Truck	40%	75	71	8	9	80
Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

- Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Concrete Turnout Structure	Concrete Pump Boom Truck Mounted (1)								
Controls rumout Structure	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (7)								
36-Inch RCP	25 TN Truck Mounted Hydraulic Crane (1)		+ +						
	Flatbed Truck (1)								
	Pickup Truck Conventional (4)								
Trashrack	Flatbed Truck (1)								
	Pickup Truck Conventional (2)								
Screw Gate	Flatbed Truck (1)								
	Pickup Truck Conventional (2)								
Outlet Fish Screen	Flatbed Truck (1)								
	Pickup Truck Conventional (2)								
Concrete Emergency Spillway	Concrete Pump Boom Truck Mounted (1)								
	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (7)								
Concrete Connection Vault	40 TN Truck Mounted Hydraulic Crane (1)								
	Haul Truck Oversize Transport (1)								
	Pickup Truck Conventional (3)								
08 - Roads, Railroads, and Bridges									
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								
	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (1)								
Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)								
	100 FT Auger Track Mounted Drill Rig (1)								
	Concrete Pump Boom Truck Mounted (1)								
	Cocnrete Mixer Truck (3)								
	0.8 CY Backhoe Loader (1)								
	24 TN Truck End Dump (2)								
	Pickup Truck Conventional (8)								
Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)								
and Wingwalls	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (7)								
Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)								
	Flatbed Truck (2)								
	Pickup Truck Conventional (5)								

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Considerations. March 10.

### Table L-20. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'	
esidential Receptor	Residentia
Distance from the Center of Construction Activity to a Receptor (ft)	
Distance Divergence (dBA)	
Atmospheric Attenuation (dBA)	
1-Hour Construction Noise Level at the Receptor (dBA)	
CNEL (Construction Noise + Existing) (dBA)	
Impact to Residential Uses	

### **Agricultural Receptor**

Distance from the Center of Construction Activity to a Receptor (ft) Distance Divergence (dBA) Atmospheric Attenuation (dBA) 1-Hour Construction Noise Level at the Receptor (dBA) CNEL (Construction Noise + Existing) (dBA) Impact to Agricultural Uses

Significance Level (dBA) Residential

> Normally Acceptable 60 Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 8000

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-20. 8-Hour Construction Noise Level at the Receptor (dBA)												E	stimat	ed Du	ıratior	ո, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	84	93	87	79	79	82	80	81	80	82	88	85	83	83	83	86	83	87	83	80	n/a	85	79	n/a	n/a	n/a	n/a	n/a
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
Distance Divergence (dBA)													18.7									18.7						18.7
Atmospheric Attenuation (dBA)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
1-Hour Construction Noise Level at the Receptor (dBA)		73		60	60	63	61	62	61	63	69		64	64	64	67	64	68	64	61	n/a	66	60	n/a	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	62	70	64	59	59	61	60	60	60	61	65	63	61	61	62	64	62	65	62	60	n/a	63	59	n/a	n/a	n/a	n/a	n/a
Impact to Residential Uses	CA	CA	CA	NA	NA	CA	NA	CA	NA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	n/a	CA	NA	n/a	n/a	n/a	n/a	n/a
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)		140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
Distance Divergence (dBA)			8.9	8.9	8.9		8.9		8.9		8.9		8.9	8.9		8.9	8.9		8.9	8.9		8.9						8.9
Atmospheric Attenuation (dBA)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
1-Hour Construction Noise Level at the Receptor (dBA)	75	83	78	70	70	73	71	72	71	73	79	76	74	74	74	77	74	78	74	71	n/a	76	70	n/a	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	71	80	74	67	67	69	68	69	68	70	75	72	70	70	70	73	70	74	70	68	n/a	72	66	n/a	n/a	n/a	n/a	n/a
Impact to Agricultural Uses	NA	CA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	n/a	NA	NA	n/a	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level Residential

(dBA)

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Source: Google Earth

Nearest residential receptor (ft) 8000

# Construction Noise - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-21. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
02 - Relocations	The first transfer of the first transfer of	4.1. 31.			1 1 1 1	1	(3)	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	3	5	75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
3 3 ( )	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
•	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals	, , , , , , , , , , , , , , , , , , , ,	1 - 1			l .		-	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	15	12	82
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
znoavanom eraamig (z.) eenamene,	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
11 - Levees and Flood walls	r lokup Truck Conventional (1)	Tionap Track	1070	, 0	, , ,		Ü	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	4	6	76
Widding and Demobilization	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1 1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Berm/ Levee Fill	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
201111/ 2000 T III	4000 Gal Water Truck (1)	Dump Truck	40%	76	72		0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73		0	73
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
15 - Floodway Control and Diversion Struc		Tiekup Truck	70 /0	73				10
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	12	11	81
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1 1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75 75	71		0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94		0	94
(Temporary Conerdam)	Pickup Truck Conventional (6)	·				<u> </u>	_	
	IFICKUD ITUCK CONVENTIONAL (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	78	4	0	78

## Construction Noise - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (A

Table L-21. 8-Hour Construction No	pise Level at 50 Feet (dBA)												E	stima	ted D	uratio	n, We	ek											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations	Equipment Description	-					_ •		•	9	10		12	13	1 14	1 13	10	17	10	19	20	<u> </u>		23		23	20		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)													1	Т														
INODINZATION AND DEMODINZATION	Extended Boom Pallet Loader (1)																												
	· · · · · · · · · · · · · · · · ·																												
Loves ORM Bood Boarding (6" AB)	Pickup Truck Conventional (1)														+		-					-							
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
T	16 CY 3 Axle Dump Truck (5)														-														
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals												ı									1	<u> </u>			<u> </u>	T		ı	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)							i																					
	4000 Gal Water Truck (1)							i																					
	Pickup Truck Conventional (7)							i																					
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												
Liosion Control Geeding	Pickup Truck Conventional (4)																												
11 - Levees and Flood walls	Pickup Truck Conventional (4)																												
	[Flath ad Tours   // and also at a surject and					I	1		ı							1	_	Τ	1	T	ı			ı	<del></del>	<u> </u>			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
D // 5"	Pickup Truck Conventional (3)																												
Berm/ Levee Fill	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
	Pickup Truck Conventional (3)																												
15 - Floodway Control and Diversion Structure																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Construction Site Dewatering	Flatbed Truck (1)																												
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)																												
	Pickup Truck Conventional (6)	L																			L		L						
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)																												
	Pickup Truck Conventional (3)																												

## Construction Noise - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
Excavation (wet Conditions)	300 HP Dozer (2)	Dozer	40%	82	77 78	2	3	81
	3.5 CY Front End Loader, Wheel (2)			79				1
	, , , ,	Front End Loader	40%		75 70	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76 75	72	9	10	82
OL (B) W	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Culvert head Wall	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Precast Box Culvert 10'x8'x30'	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
Water Control Structure	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Inflatable Obermeyer Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
19 - Buildings, Grounds, and Utilities		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad Construc	165 HP Dozer (1)	Dozer	40%	82	78	1	0	78
	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79	75	, 1	0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
Ochorete Buet Burne	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73		0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75 75	2	3	78
	Pickup Truck Conventional (7)	Pickup Truck	40%	75 75	73 71	2 7	8	79
20 -Permanent Operating Equipment	Pickup Truck Conventional (1)	Fickup Huck	40 /0	75	71	,	0	19
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	2		75
INIODIIIZAUON ANG DEMODIIIZAUON					70 75	3	5	75 75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79 75	75 74	1	0	75
Deven Florida   0 M   1   1   1   1	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1 1	0	71
Power, Electrical, & Mechanical Equipment	` '	Front End Loader	40%	79	75 74	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Communication Equipment	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

### **Construction Noise - Equipment**

### Northern Water Control Structure and Sturgeon Bypass Channel (A

Every ration (Mat Conditions)	A.F. OV. Hudroulia Everyator (4)	 						_	-	1		1	т т	
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)													
	300 HP Dozer (2)													
	3.5 CY Front End Loader, Wheel (2)													
	16 CY 3 Axle Dump Truck (9)													
	Pickup Truck Conventional (7)													
Sheet Pile Wall	Flatbed Truck (1)													
	75 TN Crane Crawler Pile Hammer (1)													
	Pickup Truck Conventional (6)													
Culvert head Wall	2.5" Dia. Concrete Vibrator (1)													
	Concrete Mixer Truck (2)													
	Pickup Truck Conventional (6)													
Precast Box Culvert 10'x8'x30'	90 TN Truck Mounted Hydraulic Crane (1)													
	Flatbed Truck (2)													
	Pickup Truck Conventional (4)													
Water Control Structure	2.5" Dia. Concrete Vibrator (1)													
	Concrete Mixer Truck (2)													
	Pickup Truck Conventional (6)													
Inflatable Obermeyer Gates	90 TN Truck Mounted Hydraulic Crane (1)											+		
	Haul Truck Oversize Transport (1)													
	Pickup Truck Conventional (4)													
19 - Buildings, Grounds, and Utilities	Tiokap Track Conventional (1)													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)		T I				Т		T			T	T 1	_
INODITIZATION AND DEMODIFIZATION	Extended Boom Pallet Loader (1)													
	Pickup Truck Conventional (1)													
CMU Building and Earthwork Pad Constru														
Civio Building and Earthwork Fad Constitu	Scraper (1)													
	Motor Grader (1)													
	Compactor (1)													
	4000 Gal Water Truck (1)													
	10 TN Smooth Roller (1)													
	Pickup Truck Conventional (7)													
	Concrete Pump Boom Truck Mounted (1)													
	2.5" Dia. Concrete Vibrator (1)													
	Extended Boom Pallet Loader (1)													
	Concrete Mixer Truck (1)													
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)													
	2.5" Dia. Concrete Vibrator (1)													
	Concrete Mixer Truck (2)													
	Pickup Truck Conventional (7)							<u> </u>						
20 -Permanent Operating Equipment														
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)													
	Extended Boom Pallet Loader (1)													
	Pickup Truck Conventional (1)													
Power, Electrical, & Mechanical Equipmen														
	Pickup Truck Conventional (3)													
Communication Equipment	Pickup Truck Conventional (3)													
	d Habitat Restoration & Fish Passage Project	 1						 					1 1	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

## Construction Noise - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

#### Table L-22. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'

**Residential Receptor** 

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Residential Uses

**Agricultural Receptor** 

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses

\*Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) Source: Google Earth 2600

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

## Construction Noise - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (A

Table L-22. 8-Hour Construction Noise Level at the Receptor (dBA)												Е	stimat	ted Du	uratio	n, Wee	ek											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	87	94	94	91	92	93	91	95	89	91	95	87	86	84	83	84	84	84	78	80	80	85	79	n/a	n/a	n/a	n/a	n/a
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)						580		580						580		580		580				580		580				
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
1-Hour Construction Noise Level at the Receptor (dBA)	65	72	72	70	71	71	70	73	67	69	74	65	64	62	61	62	62	62	57	59	59	63	57	n/a	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	62	68	69	66	67	67	66	70	64	66	70	62	62	61	60	60	60	60	58	58	58	61	58	n/a	n/a	n/a	n/a	n/a
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	NA	CA	NA	n/a	n/a	n/a	n/a	n/a
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190
Distance Divergence (dBA)	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6
Atmospheric Attenuation (dBA)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
1-Hour Construction Noise Level at the Receptor (dBA)	75	82	82	80	81	81	80	83	77	79	84	75	74	72	71	72	72	72	67	69	69	73	67	n/a	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	71	78	78	76	77	77	76	80	74	76	80	71	70	69	67	69	69	68	64	65	65	70	64	n/a	n/a	n/a	n/a	n/a
Impact to Agricultural Uses	NA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	n/a	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level (dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 2600

## Construction Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-23. 8-Hour Construction Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
02 - Relocations	·	•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	3	5	75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
	16 CY 3 Axle Dump Truck (5)	Dump Truck	40%	76	72	5	7	79
Temporary Electrical Power	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
•	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
09 - Channels and Canals								<u> </u>
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	15	12	82
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
3	Trailer Mounted Brush Chipper (1)	Shears (on backhoe)	40%	96	92	1 1	0	92
	Chainsaw (1)	Chain Saw	20%	84	77	1	0	77
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Dozer	40%	82	78	1	0	78
= noarallers Craaling (2.) Containency	21 CY Scrapers (4)	Scraper	40%	84	80	4	6	86
	12' Blade Grader (1)	Grader	40%	85	81	1 1	0	81
	4000 GAL Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	Excavator	40%	81	77	2	3	80
Tupidp Glass 2	300 HP Dozer Crawler (1)	Dozer	40%	82	78	1 1	0	78
	Pickup Truck Conventional (5)	Pickup Truck	40%	75	71	5	7	78
	16 CY 3 Axle Dump Trucks (23)	Dump Truck	40%	76	72	23	, 14	86
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	Front End Loader	40%	79	75	1	0	75
Litesion Control Occurry	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
11 - Levees and Flood walls	Fickup Truck Conventional (4)	Гіскир Писк	40 /0	13	/ 1	4	0	
Mobilization and Demobilization	Flathad Truck (1 par piece of equipment)	Flat Bed Truck	400/	74	70	1	6	76
WOODIIIZALION AND DEMODIIIZALION	Flatbed Truck (1 per piece of equipment)		40% 40%	74 79	70 75	4	6 0	76 75
	Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)	Front End Loader Pickup Truck	40%	79 75	75 71	1 2	_	75 76
Dorm/Loves Fill		<u> </u>	40%	82	71	3	5	78
Berm/ Levee Fill	300 HP Dozer (1)	Dozer	1				0	
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72 72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
A.F. Flanders Control and Diversion Office	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
15 - Floodway Control and Diversion Stru		Flat Dad Truck	100/	7.4	70	40	4.4	04
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74 70	70 75	12	11	81
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79 75	75 74	1 1	0	75 74
0. 1. 1. 0. 1.	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Construction Site Dewatering	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1 1	0	70
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	Pumps	50%	81	78	1	0	78
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76

## Construction Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

Passe	Table L-23. 8-Hour Construction No	ise Level at 50 Feet (dBA)												E	Estima	ated D	uratio	n, We	ek											
Mobilization and Demobilization Platible Truck (1 per piece of equipment) Enteroide Boxin Pullet Loadint (1) Platible Truck (2) Evere OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Road Road Road Road Road Road Road		1	1												T		T	T												
Mobilization and Demobilization Platible Truck (1 per piece of equipment) Enteroide Boxin Pullet Loadint (1) Platible Truck (2) Evere OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Regarding (o' AS) Livree OSM Road Road Road Road Road Road Road Road																														ı
Mobilization and Democlization Extended Stoom Pale Loader (1) Prototy Truck Conventional (2) Levee O&M Read Regrading (8' AB) 12 Based Greater (1) 13 Based Greater (1) 14 Based Greater (1) 15 Based Greater (1) 16 Cy 3 Abid Dum Truck (0) 16 Cy 3 Abid Dum Truck (1) 16 Cy 3 Abid Dum Truck (1) 16 Cy 3 Abid Dum Truck (1) 17 Emporary Electrical Power 18 Fished Truck (1) 18 Cy 3 Abid Dum Truck (1) 18 Cy 3 Abid Dum Truck (1) 18 Cy 3 Abid Dum Truck (1) 18 Cy 3 Abid Dum Truck (1) 18 Cy 3 Abid Dum Truck (1) 18 Cy 3 Abid Dum Truck (1) 18 Cy 4 Abid Dum Truck (1) 18 Cy 4 Abid Dum Truck (1) 18 Cy 5 Abid Dum Truck (1) 18 Cy 5 Abid Dum Truck (1) 18 Cy 5 Abid Dum Truck (1) 18 Cy 5 Abid Dum Truck (1) 18 Cy 5 Abid Dum Truck (1) 18 Cy 5 Abid Dum Truck (1) 19 Cy 5 Cy 5 Abid Dum Truck (1) 19 Cy 5 Cy 5 Cy 5 Cy 5 Cy 5 Cy 5 Cy 5 Cy		Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Exercised Boom Pallet Loader (1)				_																					_			1		
Discuss   Track Conventional (2)	Mobilization and Demobilization																												ļ	l
Levee O&M Road Regarding (6" AB) 12 Elase Grader (1) ADOS GAI Water Truck (1) Pickup Truck Conventional (1) Ferrior Truck Conventional (2) Patient Truck (1) Pickup Truck Conventional (2)  95 - Channells and Carnels Mobilization and Demobilization Fisted Truck (1) Pickup Truck Conventional (1) Fisted Truck (1) Pickup Truck Conventional (1) Fisted Truck (1) Pickup Truck Conventional (1) Fisted Truck (1) Pickup Truck Conventional (1) Fisted Truck (1) Pickup Truck Conventional (1) Fisted Truck (1) Pickup Truck Conventional (1) Fisted Truck (1) Pickup Truck Conventional (6) Fisted Truck (1) Pickup Truck Conventional (6) Fisted Truck (1) Pickup Truck Conventional (6) Fisted Truck (1) Pickup Truck Conventional (7) Riprap - Class 2 JS CY Hydrause Excensions (2) Soo Hy Descr Crucker (1) Pickup Truck Conventional (7) Fisted Truck (1) Pickup Truck Conventional (7) Fisted Truck (1) Pickup Truck Conventional (7) Fisted Truck (1) Pickup Truck Conventional (7) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Pickup Truck Conventional (8) Fisted Truck (1) Fisted Truck		· ·																											ļ	ı
A000 Gal Water Truck (1) Pickop Truck Conventional (1) 16 C7 3 Aske Dump Truck (8) Fathed Truck (1) Fathed T																														
Pickup Truck Conventional (1) 16 CY 3 Aria Dump Truck (5)  Temporary Electrical Power Flatbed Truck (1) Flatbed Truck (1	Levee O&M Road Regrading (6" AB)																												ļ	l
Temporary Electrical Power		` '																											ļ	ı
Temporary Electrical Power   Flatbed Truck (1)   Pickup Truck Conventional (2)																													ļ	ı
Declaration   Policy Truck Conventional (2)																														
Mobilization and Demobilization   Flatbed Truck (1 per piece of equipment)	Temporary Electrical Power																												ļ	l
Flatbed Truck (1 per piece of equipment)		Pickup Truck Conventional (2)																												
Extended Boom Pallet Loader (1)   Pickup Truck Conventional (1)																														
Pickup Truck Conventional (1)   Pickup Truck Conventional (1)   Pickup Truck Conventional (2)   Pickup Truck Conventional (3)   Pickup Truck Conventional (3)   Pickup Truck Conventional (3)   Pickup Truck Conventional (3)   Pickup Truck Conventional (3)   Pickup Truck Conventional (4)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (7)   Pickup Truck Conventional (8)   Pickup Truck Conventional (8)   Pickup Truck Conventional (8)   Pickup Truck Conventional (8)   Pickup Truck Conventional (8)   Pickup Truck Conventional (4)   Pickup Truck Conventional (4)   Pickup Truck Conventional (4)   Pickup Truck Conventional (4)   Pickup Truck Conventional (4)   Pickup Truck Conventional (5)   Pickup Truck Conventional (4)   Pickup Truck Conventional (5)   Pickup Truck Conventional (6)   Pickup Truck Conventional (7)   Pickup Truck Conventional (8)   Pickup Truck Conventional (8)   Pickup Truck Conventional (8)   Pickup Truck Conventional (8)   Pickup Truck Conventional (9	Mobilization and Demobilization																													
Clearing and Grubbing  1.5 CY Front End Loader Crawler (1) Trailer Mounted Buss Chipper (1) Chainsaw (1) 4000 Gall Water Truck (1) Pickup Truck Conventional (6) 15 CY 3 Axie Dump Truck (1) 21 CY Scrapers (4) 12 Blade Grader (1) 4000 GAL Water Truck (1) Pickup Truck Conventional (7) Pickup Truck Conventional (7) Pickup Truck Conventional (7) Pickup Truck Conventional (7) Pickup Truck Conventional (7) Pickup Truck Conventional (8) 16 CY 3 Axie Dump Trucks (22) Forsion Control Seeding 0.8 CY Front End Loader (1) Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) 4000 GAL Water Truck (1) Pickup Truck Conventional (3) Pickup Truck Conventional (3) Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3) Flatbed Truck (1) Flore Truck (1) Flor		Extended Boom Pallet Loader (1)																											ļ	ı
Trailer Mounted Brush Chipper (1) Chainsaw (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (6) 16 CY 3 Axle Dump Truck (1) 21 CY Scrapers (4) 12 Blade Grader (1) 4000 GAL Water Truck (1) Pickup Truck Conventional (7) Pickup Truck Conventional (7) Pickup Truck Conventional (7) Pickup Truck Conventional (6) 16 CY 3 Axle Dump Trucks (23) 300 HP Dozer Crawfer (1) Pickup Truck Conventional (6) 16 CY 3 Axle Dump Trucks (23) Erosion Control Seeding 0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4) 11 - Levees and Flood walls Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3) 300 HP Dozer (1) 4000 Gal Water Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Flatbed Truck (1) Pickup Truck Conventional (3) Pickup Truck Conventional (4) Pickup Truck Conventional (5) Pickup Truck Conventional (6) Pickup Truck Conventional (7) Pickup Truck Conventional (8) Pickup Truck Conventional (9) Pickup Truck Pickup Truck (9) Pickup Truck Pickup Truck Pickup Truck Pickup Truck Pickup Truck Pickup Truck Pic		Pickup Truck Conventional (1)																											ļ	ı
Chainsaw (1)	Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
4000 Gal Water Truck (1)   Pickup Truck Conventional (6)   16 CV 3 Avla Dump Truck (1)   17 Blade Grader (1)   17 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blade Grader (1)   18 Blader Grader Grader (1)   18 Blader Grader Grader (1)   18 Blader Grader Grader Grader (1)   18 Blader Grader Grader Grader Grader Grader Grader (1)   18 Blader Grader Grader Grader Grader Grader Grader Grader Grader		Trailer Mounted Brush Chipper (1)																											ļ	ı
Pickup Truck Conventional (6)   16 CY 3 Axlo Dump Truck (1)		Chainsaw (1)																											ļ	l
16 CY 3 Akle Dump Truck (1)		4000 Gal Water Truck (1)																											ļ	l
Excavation/Grading (Dry Conditions)  30 HP Dozer (1) 21 CY Scrapers (4) 112 Blade Grader (1) 4000 GAL Water Truck (1) Pickup Truck Conventional (7)  Riprap - Class 2  2.5 CY Hydraulic Excavators (2) 300 HP Dozer Crawler (1) Pickup Truck Conventional (6) 16 CY 3 Axie Dump Trucks (23)  Erosion Control Seeding  0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)  11 - Levees and Flood walls  Mobilization and Demobilization  Flatted Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatted Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatted Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)		Pickup Truck Conventional (6)																											ļ	ı
21 CY Scrapers (4)   12 Blade Grader (1)   4000 GAL Water Truck (1)   4000 GAL Water Truck (1)   4000 GAL Water Truck (1)   4000 GAL Water Truck Conventional (7)   70   70   70   70   70   70   70		16 CY 3 Axle Dump Truck (1)																											ļ	ı
12 Blade Grader (1) 4000 GAL Water Truck (1) Pickup Truck Conventional (7)  Riprap - Class 2 2.5 CY Hydraulic Excavators (2) 300 HP Dozer Crawler (1) Pickup Truck Conventional (5) 16 CY 3 Axie Dump Trucks (23)  Erosion Control Seeding 0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)  11 - Levees and Flood walls  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill 300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)	Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
A000 GAL Water Truck (1)   Pickup Truck Conventional (7)     Riprap - Class 2   2.5 CY Hydraulic Excavators (2)   300 HP Dozer Crawler (1)   Pickup Truck Conventional (5)   16 CY 3 Avide Dump Trucks (23)     Erosion Control Seeding   0.8 CY Front End Loader, Wheel (1)   Pickup Truck Conventional (4)     11 - Levees and Flood walls   Flatbed Truck (1 per piece of equipment)   Extended Boom Pallet Loader (1)   Pickup Truck Conventional (3)     Berm/ Levee Fill   300 HP Dozer (1)   4000 Gal Water Truck (1)   10 TN Smooth Roller (1)   Pickup Truck Conventional (3)     15 - Floodway Control and Diversion Structures   Mobilization   Flatbed Truck (1 per piece of equipment)   Extended Boom Pallet Loader (1)   Pickup Truck Conventional (3)     15 - Floodway Control and Diversion Structures   Flatbed Truck (1 per piece of equipment)   Extended Boom Pallet Loader (1)   Pickup Truck Conventional (1)   Pickup Truck Convent		21 CY Scrapers (4)																											ļ	ı
Pickup Truck Conventional (7)  RIprap - Class 2  2.5 CY Hydraulic Excavators (2) 300 HP Dozer Crawler (1) Pickup Truck Conventional (5) 16 CY 3 Ask Dump Truck Conventional (3)  Erosion Control Seeding  0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)  11 - Levees and Flood walls  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3) Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)		12' Blade Grader (1)																											ļ	ı
Riprap - Class 2  2.5 CY Hydraulic Excavators (2) 330 HP Dozer Crawler (1) Pickup Truck Conventional (5) 16 CY 3 Ayle Dump Trucks (23)  Erosion Control Seeding 0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)  11 - Levees and Flood walls  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Paller Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill 300 HP Dozer (1) 4000 Gall Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Paller Loader (1) Pickup Truck Conventional (3)		4000 GAL Water Truck (1)																											ļ	l
300 HP Dozer Crawler (1) Pickup Truck Conventional (5) 16 CY 3 Axle Dump Trucks (23)  Erosion Control Seeding  0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)  I1 - Levees and Flood walls  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1) Pickup Truck Conventional (1)		Pickup Truck Conventional (7)																											ļ	l
Pickup Truck Conventional (5) 16 CY 3 Axile Dump Trucks (23)  Erosion Control Seeding  0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)  11 - Levees and Flood walls  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1) Pickup Truck (1) Pickup Truck (1) Pickup Truck (1) Pickup Truck (2) Pickup Truck (3)	Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
16 CY 3 Axle Dump Trucks (23)		300 HP Dozer Crawler (1)																											ļ	ı
Erosion Control Seeding 0.8 CY Front End Loader, Wheel (1) Pickup Truck Conventional (4)  11 - Levees and Flood walls  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill 300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)		Pickup Truck Conventional (5)																											ļ	l
Pickup Truck Conventional (4)  11 - Levees and Flood walls  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)		16 CY 3 Axle Dump Trucks (23)																											ļ	ı
11 - Levees and Flood walls  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)	Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												
Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)		Pickup Truck Conventional (4)																											ļ	ı
Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill 300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)	11 - Levees and Flood walls								•				•					·			•				•		<u> </u>			
Extended Boom Pallet Loader (1) Pickup Truck Conventional (3)  Berm/ Levee Fill 300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)	Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
Berm/ Levee Fill  300 HP Dozer (1) 4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)																													ļ	l
4000 Gal Water Truck (1) 10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)																													ļ	l
10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)	Berm/ Levee Fill	300 HP Dozer (1)																												
10 TN Smooth Roller (1) Pickup Truck Conventional (3)  15 - Floodway Control and Diversion Structures  Mobilization and Demobilization Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)		4000 Gal Water Truck (1)																											ļ	ı
15 - Floodway Control and Diversion Structures  Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment)  Extended Boom Pallet Loader (1)  Pickup Truck Conventional (1)																													ļ	l
Mobilization and Demobilization  Flatbed Truck (1 per piece of equipment)  Extended Boom Pallet Loader (1)  Pickup Truck Conventional (1)		Pickup Truck Conventional (3)																											ļ	l
Extended Boom Pallet Loader (1) Pickup Truck Conventional (1)																														
Pickup Truck Conventional (1)	Mobilization and Demobilization																													
		` '																											ļ	l
Construction Site Dewatering Flatbed Truck (1)		Pickup Truck Conventional (1)	<u> </u>																							<u> </u>				
	Construction Site Dewatering	Flatbed Truck (1)																												
(Temporary Cofferdam) 75 TN Crane Crawler Pile Hammer (1)	(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)																												l
Pickup Truck Conventional (6)		Pickup Truck Conventional (6)																											ļ	l
Construction Site Dewatering (Pumping) 6" Dia. Pump Engine Drive (1)	Construction Site Dewatering (Pumping)																													
Pickup Truck Conventional (3)		Pickup Truck Conventional (3)																											ļ	ĺ

## Construction Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Excavation (Wet Conditions)	4.5.CV Hydraulia Evacyator (1)	Excavator	40%	01	77	- 1	٥	77
Excavation (wet Conditions)	4.5 CY Hydraulic Excavator (1)			81 82	77	1	0	77
	300 HP Dozer (2)	Dozer	40%		78 75	2	3	81
	3.5 CY Front End Loader, Wheel (2)	Front End Loader	40%	79	75 70	2	3	78
	16 CY 3 Axle Dump Truck (9)	Dump Truck	40%	76	72	9	10	82
01 (8) 14 11	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
Sheet Pile Wall	Flatbed Truck (1)	Flat Bed Truck	40%	74	70	1	0	70
	75 TN Crane Crawler Pile Hammer (1)	Impact Pile Driver	20%	101	94	1	0	94
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Culvert head Wall	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Precast Box Culvert 10'x8'x30'	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Flatbed Truck (2)	Flat Bed Truck	40%	74	70	2	3	73
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
Water Control Structure	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	1	0	73
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79	75	2	3	78
	Pickup Truck Conventional (6)	Pickup Truck	40%	75	71	6	8	79
Inflatable Obermeyer Gates	90 TN Truck Mounted Hydraulic Crane (1)	Crane	16%	81	73	1	0	73
	Haul Truck Oversize Transport (1)	Flat Bed Truck	40%	74	70	1	0	70
	Pickup Truck Conventional (4)	Pickup Truck	40%	75	71	4	6	77
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70	10	10	80
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
CMU Building and Earthwork Pad	165 HP Dozer (1)	Dozer	40%	82	78	1	0	78
Construction	Scraper (1)	Scraper	40%	84	80	1	0	80
	Motor Grader (1)	Grader	40%	85	81	1	0	81
	Compactor (1)	Compactor (ground)	20%	83	76	1	0	76
	4000 Gal Water Truck (1)	Dump Truck	40%	76	72	1	0	72
	10 TN Smooth Roller (1)	Roller	20%	80	73	1	0	73
	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%	80	73	, 1	0	73
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75 75		0	75
	Concrete Mixer Truck (1)	Concrete Mixer Truck	40%	79 79	75 75		0	75
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	Concrete Pump Truck	20%	81	74	1	0	74
Concrete Duct Bank		•		80	73		0	73
	2.5" Dia. Concrete Vibrator (1)	Vibratory Concrete Mixer	20%			1	_	
	Concrete Mixer Truck (2)	Concrete Mixer Truck	40%	79 75	75 74	2	3	78
00 0 10 11 11 11	Pickup Truck Conventional (7)	Pickup Truck	40%	75	71	7	8	79
20 -Permanent Operating Equipment	Flothed Truck (4 per since of agricus at	Flot Dod Trus!:	400/	7.4	70			75
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Flat Bed Truck	40%	74	70 75	3	5	75 75
	Extended Boom Pallet Loader (1)	Front End Loader	40%	79	75	1 1	0	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Power, Electrical, & Mechanical Equipment	` '	Front End Loader	40%	79	75	1	0	75
	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76
Communication Equipment	Pickup Truck Conventional (3)	Pickup Truck	40%	75	71	3	5	76

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

### Construction Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

300 HP Dozer (?) 3.5 CV Front End Loader, Wheel (2) 16 CV 3 Aute Dump Truck (9) Pickup Truck Conventional (7) Hetel Pile Wall Flatbed Truck (1) 75 TN Crane Crawler Pile Hammer (1) Pickup Truck Conventional (6) Ulvert head Wall 2.5° Dia. Concrete Vibrator (1) Concrete Mixer Truck (2) Pickup Truck Conventional (6)  10 TN Truck Mounted Hydraulic Crane (1) Flatbed Truck (2) Pickup Truck Conventional (4) 2.5° Dia. Concrete Vibrator (1) Concrete Mixer Truck (2) Pickup Truck Conventional (4) 2.5° Dia. Concrete Vibrator (1) Concrete Mixer Truck (2) Pickup Truck Conventional (4) 2.5° Dia. Concrete Vibrator (1) Concrete Mixer Truck (2) Pickup Truck Conventional (4) 2.5° Dia. Concrete Vibrator (1) Concrete Mixer Truck (2) Pickup Truck Conventional (4) 2.5° Dia. Concrete Vibrator (1) Pickup Truck Convention				 					 		 		
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	Communication Equipment		+	+									
		( )											

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

## Construction Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

#### Table L-24. 8-Hour Construction Noise Level at the Receptor (dBA)

Total Construction Leq(h) @ 50'

**Residential Receptor** 

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Residential Uses

Agricultural Receptor

Distance from the Center of Construction Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour Construction Noise Level at the Receptor (dBA)

CNEL (Construction Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) 800

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

## **Construction Noise - Equipment** Southern Water Control Structure and Sturgeon Bypass Channel (A

Table L-24. 8-Hour Construction Noise Level at the Receptor (dBA)												E	stimat	ed Du	ıratioı	ı, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Construction Leq(h) @ 50'	87	94	94	94	92	93	93	96	92	91	95	90	90	90	90	90	90	90	89	85	85	85	79	n/a	n/a	n/a	n/a	n/a
Residential Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)				630									630			630								630				630
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
1-Hour Construction Noise Level at the Receptor (dBA)	64	71	71	71	70	70	71	74	69	69	73	67	67	67	67	67	67	67	67	62	62	62	57	n/a	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	62	68	68	68	67	67	67	70	66	65	69	64	64	64	64	64	64	64	64	60	60	60	58	n/a	n/a	n/a	n/a	n/a
Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	n/a	n/a	n/a	n/a	n/a
Agricultural Receptor																												
Distance from the Center of Construction Activity to a Receptor (ft)			210					210								210	-							210	210			210
Distance Divergence (dBA)																												
Atmospheric Attenuation (dBA)		0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1-Hour Construction Noise Level at the Receptor (dBA)	74	81	81	81	80	80	80	83	79	79	83	77	77	77	77	77	77	77	76	72	72	72	67	n/a	n/a	n/a	n/a	n/a
CNEL (Construction Noise + Existing) (dBA)	70	77	77	78	76	76	77	80	75	75	79	74	73	74	73	74	74	73	73	69	69	69	64	n/a	n/a	n/a	n/a	n/a
Impact to Agricultural Uses	NA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	n/a	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level Residential

(dBA)

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

800

Nighttime 45

Receptors:

Nearest residential receptor (ft)

Table L-25. Equipment noise emissions and acoustical usage factors database

Table L-25. Equipment noise emissi	ons and a	coustical us	sage factors d	atabase
Equipment Description	Impact Device?	Acoustica I Use Factor	Spec 721.560 Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50 ft (dBA, slow)
All Other Equipment > 5 hp	No	50%	85	N/A
Auger Drill Rig	No	20%	85	84
Backhoe	No	40%	80	78
Bar Bender	No	20%	80	N/A
Blasting	Yes	1%	94	N/A
Boring Jack Power Unit	No	50%	80	83
Chain Saw	No	20%	85	84
Clam Shovel (dropping)	Yes	20%	93	87
Compactor (ground)	No	20%	80	83
Compressor (air)	No	40%	80	78
. ,				_
Concrete Batch Plant	No	15%	83	N/A
Concrete Mixer Truck	No	40%	85	79
Concrete Pump Truck	No	20%	82	81
Concrete Saw	No	20%	90	90
Crane	No	16%	85	81
Dozer	No	40%	85	82
Drill Rig Truck	No	20%	84	79
Drum Mixer	No	50%	80	80
Dump Truck	No	40%	84	76
Excavator	No	40%	85	81
Flat Bed Truck	No	40%	84	74
Front End Loader	No	40%	80	79
Generator	No	50%	82	81
Generator (<25KVA, VMS signs)	No	50%	70	73
Gradall	No	40%	85	83
Grader	No	40%	85	N/A
Grapple (on backhoe)	No	40%	85	87
Horizontal Boring Hydr. Jack	No	25%	80	82
Hydra Break Ram	Yes	10%	90	N/A
Impact Pile Driver	Yes	20%	95	101
Jackhammer	Yes	20%	85	89
Man Lift	No	20%	85	75
Mounted Impact Hammer (hoe ram)	Yes	20%	90	90
Pavement Scarifier	No	20%	85	90
Paver	No	50%	85	77
Pickup Truck	No	40%	55	75
Pneumatic Tools	No	50%	85	85
Pumps	No	50%	77	81
Refrigerator Unit	No	100%	82	73
Rivit Buster/Chipping Gun	Yes	20%	85	79
Rock Drill	No	20%	85	81
Roller	No	20%	85	80
Sand Blasting (Single Nozzle)				
- · · · · · · · · · · · · · · · · · · ·	No	20%	85	96
Scraper	No	40%	85	84
Shears (on backhoe)	No	40%	85	96
Slurry Plant	No	100%	78	78
Slurry Trenching Machine	No	50%	82	80
Soil Mix Drill Rig	No	50%	80	N/A
Tractor	No	40%	84	N/A
Vacuum Excavator (vac-truck)	No	40%	85	85
Vacuum Street Sweeper	No	10%	80	82
Ventilation Fan	No	100%	85	79
Vibrating Hopper	No	50%	85	87
Vibratory Concrete Mixer	No	20%	80	80
Vibratory Pile Driver	No	20%	95	101
Warning Horn	No	5%	85	83
Welder/Torch	No	40%	73	74
Source: EHMA DCNM Hear's Guide Tak	1- 4 OA/T -			

Source: FHWA. RCNM User's Guide - Table 1. CA/T equipment noise emissions and acoustical usage fac

Note: Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power. In case of construction blasting, the equipment gives a very short duration blast and can be quantified by using a 1% usage factor in the RCNM to allow for some prediction.

#### Appendix L Noise and Vibration Calculations

Table L-26. Atmospheric Attenuation

Assumptions	
Ambient pressure (kPa)	101.3
Temperature (F)	68
Relative humidity (%)	90
Frequency of noise source (Hz)	500
Air Attenuation Coefficient (α, dB/km)	2.7
(dB/ft)	0.0008

 $A_{air} = \alpha d$ 

Weather in Yolo County

Average temperature 60.8  $^{\circ}$ F Average relative humidity 81.35  $^{\circ}$ 

#### Reference:

Harris, Cyril M. 1998. Handbook of Acoustical Measurements and Noise Control. 3rd ed. - Chapter 3 Calculation of Attenuation https://www.ncdc.noaa.gov/cdo-web/datatools/normals, Sacramento Metropolitan Airport annual average temperature 1981-2010 http://www.usa.com/yolo-county-ca-weather.htm

Conversion: 0.3048 m/ft 1000 m/km

Table L-27. Average Ambient Noise Levels for Various Land Uses

Land Use Description	Average Ldn (dBA)	Daytime Leq (dBA)	Nighttime Leq (dBA)
Wilderness	35	35	25
Rural Residential	40	40	30
Quiet Suburban Residential	50	50	40
Normal Suburban Residential	55	55	45
Urban Residential	60	60	50
Noisy Urban Residential	65	65	55
Very Noisy Urban Residential	70	70	60

Source: U.S. EPA, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974.

**Table L-28. Noise Reductions from Mitigation Measures** 

Mitigation Type	Reduction (dBA)
Noise barrier or other obstruction just barely breaks the line-of-sight between the noise source and the receptor	3
Noise source completely enclosed or completely shielded with solid barrier located close to the source	8
Enclosure and/or barrier with some gaps	5
Noise source completely enclosed and completely shielded with a solid barrier located close to the source	10
Noise source enclosed or shielded with heavy vinyl noise curtain material	5

Source: FHWA. RCNM User's Guide Appendix A Best Practices for Calculating Estimated Shielding for Use in the RCNM

Table L-29. Alt 1 Daily Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without Construction Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		668	404	55	10.4	7,350	63,750	1.1	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	668	404	55	10.4	7,350	63,550	1.1	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-30. Alt 1 Peak Hourly Construction Traffic - Equivalent Noise Levels

			Peak Hourly	Peak Hour	Peak Hour		Equivalency Factor for Heavy-Duty	Equivalent	Total with		Noise Level	Substantial Noise Increase	Above
Туре	Roadway	Segment	Volume	Truck Trips		Average Speed	, ,	Vehicles	Project	Increase Ratio	Increase (dBA)	I I	Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		668	202	55	10.4	7,148	12,788	2.3	4	12	No
Interstate	I-5	CR 117 to CR 102	5,620	668	202	55	10.4	7,148	12,768	2.3	4	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-31. Alt 2 Daily Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without Construction Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		599	446	55	10.4	6,676	63,076	1.1	0	12	No
Interstate	I-5	CR 117 to CR 102	56,200	599	446	55	10.4	6,676	62,876	1.1	0	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-32. Alt 2 Peak Hourly Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		599	223	55	10.4	6,453	12,093	2.1	3	12	No
Interstate	I-5	CR 117 to CR 102	5,620	599	223	55	10.4	6,453	12,073	2.1	3	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-33. Alt 3 Daily Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without Construction Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		597	554	55	10.4	6,768	63,168	1.1	0	12	No
Interstate	I-5	CR 117 to CR 102	56,200	597	554	55	10.4	6,768	62,968	1.1	0	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-34. Alt 3 Peak Hourly Construction Traffic - Equivalent Noise Levels

			Peak Hourly	Peak Hour	Peak Hour		Equivalency Factor for Heavy-Duty	Equivalent	Total with			Substantial Noise Increase	Above
Type	Roadway	Segment	Volume	Truck Trips	Worker Trips	Average Speed	Vehicles	Vehicles	Project	Increase Ratio	Increase (dBA)	(dBA)	Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		597	277	55	10.4	6,491	12,131	2.2	3	12	No
Interstate	I-5	CR 117 to CR 102	5,620	597	277	55	10.4	6,491	12,111	2.2	3	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-35. Alt 4 Daily Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without Construction Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117	56,400	1,645	726	55	10.4	17,836	74,236	1.3	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	1,645	726	55	10.4	17,836	74,036	1.3	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-36. Alt 4 Peak Hourly Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117	5,640	1,645	363	55	10.4	17,473	23,113	4.1	6	12	No
Interstate	I-5	CR 117 to CR 102	5,620	1,645	363	55	10.4	17,473	23,093	4.1	6	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-37. Alt 5 Daily Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without Construction Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117	56,400	634	598	55	10.4	7,190	63,590	1.1	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	634	598	55	10.4	7,190	63,390	1.1	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-38. Alt 5 Peak Hourly Construction Traffic - Equivalent Noise Levels

			Peak Hourly	Peak Hour	Peak Hour		Equivalency Factor for Heavy-Duty	Equivalent	Total with		Noise Level	Substantial Noise Increase	Above
Туре	Roadway	Segment	Volume	Truck Trips	Worker Trips	Average Speed	, ,	Vehicles	Project	Increase Ratio	Increase (dBA)	I I	Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		634	299	55	10.4	6,891	12,531	2.2	3	12	No
Interstate	I-5	CR 117 to CR 102	5,620	634	299	55	10.4	6,891	12,511	2.2	3	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-39. Alt 6 Daily Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without Construction Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		895	828	55	10.4	10,137	66,537	1.2	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	895	828	55	10.4	10,137	66,337	1.2	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-40. Alt 6 Peak Hourly Construction Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		895	414	55	10.4	9,723	15,363	2.7	4	12	No
Interstate	I-5	CR 117 to CR 102	5,620	895	414	55	10.4	9,723	15,343	2.7	4	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-41. Construction Vibration and Ground-Borne Vibration

Table L-41. Construction Vibration	and Ground-Borne Vibration	1			T			
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	- 1
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	3.5 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	- 1
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1	-	-	-	0	- 1
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	- 1
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 GAL Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	- 1
09 - Channels and Canals								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	28	0.076	2.128	86	29	115
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1	-	-	-	0	-
	Chainsaw (1)	n/a	1	-	-	-	0	- 1
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	- 1
,	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	_	-	17	-
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	21 CY Scrapers (4)	n/a	4	-	_	-	12	- 1
	12' Blade Grader (1)	n/a	1	-	_	-	0	- 1
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	_	_	17	_
Earthen Backfill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	4000 Gal Water Truck (1)	Loaded Trucks	1	0	0	86	0	86
	10 TN Smooth Roller (1)	n/a	1 1	-	_	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	_	_	10	_
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1 1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	- 3.555	-	14	'.
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	n/a	23	-	1.770	-	6	
Tupidp Oldoo o	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	0.089	0.009	-	14	"
						l .		112
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113

DOD De delle e Makasial	0.5.0\(11dd-55	I., /-	1 0			1		
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1 1	-	-	-	0	-
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-
11-Levees and Floodwalls				-	-	-	-	-
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	7	0.076	0.532	86	17	103
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Soil Cement Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	2.5 CY Hydraulic Excavators (1)	n/a	1 1	-	_	-	0	-
	16 CY 3 Axle Dumpt Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Flash Mixer (1)	n/a	1	-	_		0	_
	Slurry Pump (1)	n/a	1 1	_	_	l <u>.</u>	0	_
	Pickup Truck Conventional (5)	n/a	5	_	_	_	14	_
15 - Floodway Control and Diversion Struc		III/a	<u> </u>	_			17	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	14	0.076	1.064	86	23	109
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	n/a	1	0.070	1.004	_	0	103
	Pickup Truck Conventional (1)	n/a	1	_	_	_	0	_
Construction Site Dewatering	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
•	. ,	Pile Driver (impact)	1 1			1	0	
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)			0.644	0.644	104		104
0 1 1 0 1 1 1 1	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-		-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	_	-	18	-
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	-	_	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	n/a	1	_	-	-	0	-
Transmer Chamber Transmer	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	0.102	-	16	_
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1				0	
ininged bottom Gates	Haul Truck Oversize Transport (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)		4	0.070	0.070		12	
	I lokup Huck Conventional (4)	n/a	4	-			12	

08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	5	0.076	0.38	86	14	100
	Extended Boom Pallet Loader (1)	n/a	1	_	-	_	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
ŭ	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Cocnrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	_
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	-	18	
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	n/a	1	_	_	_	0	_
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	_	_	_	ő	_
and wingwand	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	0.070	0.102	-	17	-
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1				0	
r edestriari Bridge Spari iristaliation	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (5)	n/a	5	0.070	0.132	00	14	32
19 - Buildings, Grounds, and Utilities	Fickup Truck Conventional (5)	П/а	3	-	-	-	14	-
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	86	20	106
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	n/a	10	0.076	0.76	00	0	100
	Pickup Truck Conventional (1)	n/a	1 1	_	-	_		-
CMII Duilding and Forthwork Dad			1	0.089	0.089	- 07	0	87
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer		0.089	0.089	87	_	87
Construction	Scraper (1)	n/a		-	-	-	0	-
	Motor Grader (1) Compactor (1)	n/a n/a	1 1	-	-	-	0	-
	4000 GAL Water Truck (1)	Loaded Trucks		0.076	0.076	86	0	86
	* *		1 1	0.076	0.076	00	0	00
	10 TN Smooth Roller (1)	n/a		· -	-	-	17	_
	Pickup Truck Conventional (7)	n/a	/	-	-	-		-
	Concrete Pump Boom Truck Mounted (1)	n/a	1 .	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Extended Boom Pallet Loader (1)	n/a	1			-	0	-
	Concrete Mixer Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	Temp. Mobile Office Building (1)	n/a	1				0	-
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3			-	10	_
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Control Equipment CMU Building		n/a	3	-	-	-	10	-
Electrical Power Equipment CMU Building	•	n/a	3	-	-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
0	` '	I				1	·	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

#### Table L-42. Construction Vibration Level at the Receptor

<b>Building Damage</b>	9
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
<b>Human Annoyan</b>	ice
	Total Lv @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

7500

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

Table L-41. Construction Vibration	and Ground-Borne Vibration												E	stima	ted D	uratio	n, We	ek											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												1
	4000 GAL Water Truck (1)																												1
	Pickup Truck Conventional (1)																												1
	16 CY 3 Axle Dump Truck (5)																												1
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												1
,	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												1
	21 CY Scrapers (4)																												
	12' Blade Grader (1)	1																											
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																												
Earthen Backfill	300 HP Dozer (1)	1																											
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
	Pickup Truck Conventional (3)																												
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)	1																											
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	1																											
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)	1																											
	. 5 5 1 5 7 Mio Bamp Hadito (20)			1	1										1		1										1		

DOD D. LIE. MARKET	To 5 0 (4) 1 1 1 5 (4)	 1 1			 			1	I I	1	<u> </u>		
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)												
	300 HP Dozer Crawler (1)												
	Pickup Truck Conventional (5)												
	16 CY 3 Axle Haul Trucks (23)												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)												
	Pickup Truck Conventional (4)												
11-Levees and Floodwalls													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Soil Cement Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)												
	300 HP Dozer (1)												
	2.5 CY Hydraulic Excavators (1)												
	16 CY 3 Axle Dumpt Truck (1)												
	Flash Mixer (1)												
	Slurry Pump (1)												
	Pickup Truck Conventional (5)												
15 - Floodway Control and Diversion Struc													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Construction Site Dewatering	Flatbed Truck (1)												
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)												
(	Pickup Truck Conventional (6)												
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)												
Constitution one Domatoring (Fumping)	Pickup Truck Conventional (3)												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)												
	300 HP Dozer (2)												
	3.5 CY Front End Loader, Wheel (2)												
	16 CY 3 Axle Dump Truck (9)												
	Pickup Truck Conventional (7)												
Sheet Pile Wall	Flatbed Truck (1)											+	
Sheet File Wall	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Llanduranta Churchina Cananata Dilan												++	
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)												
	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Concrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)											$\longrightarrow$	
Headworks Structure	Concrete Pump Boom Truck Mounted (1)												
	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (7)												
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (6)												
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)												
	Haul Truck Oversize Transport (1)												
	Pickup Truck Conventional (4)												

08 - Roads, Railroads, and Bridges												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	$\overline{}$	$\overline{}$		<del></del>							
Mobilization and Demobilization	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	-+	$\overline{}$									
l edestriari bridge Concrete i lies	100 FT Auger Track Mounted Drill Rig (1)											
	Concrete Pump Boom Truck Mounted (1)											
	Cocnrete Mixer Truck (3)											
	0.8 CY Backhoe Loader (1)											
	24 TN Truck End Dump (2)											
	Pickup Truck Conventional (8)											
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	-+	<del></del>									
and Wingwalls	2.5" Dia. Concrete Vibrator (1)											
and wingwans	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	<del></del>										
- tataman bridge opan metanation	Flatbed Truck (2)											
	Pickup Truck Conventional (5)											
19 - Buildings, Grounds, and Utilities	т т т т т т т т т т т т т т т т т т т											
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)		$\overline{}$									
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
CMU Building and Earthwork Pad	165 HP Dozer (1)											
Construction	Scraper (1)											
	Motor Grader (1)											
	Compactor (1)											
	4000 GAL Water Truck (1)											
	10 TN Smooth Roller (1)											
	Pickup Truck Conventional (7)											
	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Extended Boom Pallet Loader (1)											
	Concrete Mixer Truck (1)											
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)		$\bot$									
20 -Permanent Operating Equipment	Flath ad Truck (A manage at a suit man)		$\overline{}$		<u> </u>		<del></del>	1			<u> </u>	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Machanical Hydraulia Cylindara 9 Hausia	Temp. Mobile Office Building (1)		<del></del>									
Mechanical Hydraulic Cylinders & Housing	Pickup Truck Conventional (3)											
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	-+	+++									
Civio building iviechanical Equipment	Pickup Truck Conventional (3)											
Electrical Control Equipment CMU Buildin		-+										
Electrical Control Equipment CMU Building		-+	<del></del>			+						
Communication Equipment CMO Building	Pickup Truck Conventional (3)	<del></del>	<del></del>			+						
Communication Equipment	Fickup Truck Conventional (3)											

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

Table L-42. Construction Vibration Level at the Receptor												E	stima	ted Du	ıratior	ı, Wee	k											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Building Damage																												
Total PPV @ 25'				1.11	1.28	1.29	2.81	2.75	2.38	1.66	1.5	2.02	1.99	4.05	4.3	3.98	3.83	4.21	2.13	n/a	0.3	0.08	0.08	0.08	0.08	n/a	1.82	0.46
Distance from the Center of Construction Activity to a Receptor (ft)								200													200	200	200	200	200	200	200	200
PPV at the Receptor (in/sec)	0.15	0.02	0.07	0.05	0.06	0.06	0.12	0.12	0.11	0.07	0.07	0.09	0.09	0.18	0.19	0.18	0.17	0.19	0.09	n/a	0.01	0.00	0.00	0.00	0.00	n/a	0.08	0.02
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	no	no	no	no	no	n/a	no	no
Human Annoyance																												
Total Lv @ 25'	119	103	112	109	110	110	117	117	116	113	112	114	114	121	121	120	120	121	115	n/a	98	86	86	86	86	n/a	114	102
Distance from the Center of Construction Activity to a Receptor (ft)	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080
Distance Divergence (dBA)	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1
Lv at the Receptor (VdB)	70	54	63	60	61	61	68	68	67	64	63	65	65	71	72	71	71	72	66	n/a	49	37	37	37	37	n/a	65	52
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	no	no	no	no	no	n/a	no	no

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

7500

Table L-43. Construction Vibration and Ground-Borne Vibration

Table L-43. Construction Vibration	and Ground-Borne Vibration	1			T			
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	3.5 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	- 1
09 - Channels and Canals		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	28	0.076	2.128	86	29	115
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1	-	-	-	0	-
	Chainsaw (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
,	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	_	-	17	-
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	21 CY Scrapers (4)	n/a	4	-	_	-	12	-
	12' Blade Grader (1)	n/a	1	-	_	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	_	_	17	_
Earthen Backfill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	_	_	10	_
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1 1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-		-	14	"
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	n/a	2	-		-	6	
1.05.00	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	0.009	-	14	"
						l		112
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2	-	I -		6	-
True Dodding Material	300 HP Dozer Crawler (1)	Large Bulldozer	1 1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (4)	n/a	4	_	_	_	12	-
15 - Floodway Control and Diversion Struc		1.4.4.					<u> </u>	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	14	0.076	1.064	86	23	109
	Extended Boom Pallet Loader (1)	n/a	1	-	_	_	0	-
	Pickup Truck Conventional (1)	n/a	1	-	_	_	0	-
Construction Site Dewatering	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
,	Pickup Truck Conventional (6)	n/a	6	-	_	_	16	-
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	-	-	-	0	-
3 ( 1 3)	Pickup Truck Conventional (3)	n/a	3	-	_	_	10	-
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
,	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	-	18	-
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
-	Haul Truck Oversize Transport (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	5	0.076	0.38	86	14	100
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Cocnrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	-	18	-

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	86	20	106
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Construction	Scraper (1)	n/a	1	-	-	-	0	-
	Motor Grader (1)	n/a	1	-	-	-	0	-
	Compactor (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
20 -Permanent Operating Equipment		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Power Equipment CMU Building		n/a	3	-	-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-44. Construction Vibration Level at the Receptor

<b>Building Damag</b>	je
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
<b>Human Annoya</b>	nce
	Total Lv @ 25
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

4200

Source: Google Earth

Table L-43. Construction Vibration	and Ground-Borne Vibration	/ibration Estimated Duration, Week																											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	İ																											
	4000 Gal Water Truck (1)																												ı
	Pickup Truck Conventional (1)																												ı
	16 CY 3 Axle Dump Truck (5)																												ı
Temporary Electrical Power	Flatbed Truck (1)															+			<u> </u>		1							1	•
	Pickup Truck Conventional (2)																												
09 - Channels and Canals	r ionap ridon convenience (2)																												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)															Τ			Τ					Τ		Τ	Τ	$\overline{}$	
Mosilization and Bomosilization	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																		+									+	+
Cicaring and Crabbing	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
Evenuation (Met Conditions)	16 CY 3 Axle Dump Truck (1)	-																										+	+
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
F (	Pickup Truck Conventional (7)															-													
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																											+	
Earthen Backfill	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
D: 01 0	Pickup Truck Conventional (3)																												+
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												4
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	1																											
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)							$\neg$
NOF Bedding Material	300 HP Dozer Crawler (1)							
	Pickup Truck Conventional (5)							
	16 CY 3 Axle Haul Trucks (23)							
Francian Control Conding								
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)							
AF Floriday October 1 and Discouries Office	Pickup Truck Conventional (4)							
15 - Floodway Control and Diversion Struc								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
Construction Site Dewatering	Flatbed Truck (1)							
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)							
	Pickup Truck Conventional (6)							
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)							
	Pickup Truck Conventional (3)							
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)							
	300 HP Dozer (2)							
	3.5 CY Front End Loader, Wheel (2)							
	16 CY 3 Axle Dump Truck (9)							
	Pickup Truck Conventional (7)							
Sheet Pile Wall	Flatbed Truck (1)							
	75 TN Crane Crawler Pile Hammer (1)							
	Pickup Truck Conventional (6)							
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)							
	100 FT Auger Track Mounted Drill Rig (1)							
	Concrete Pump Boom Truck Mounted (1)							
	Concrete Mixer Truck (3)							
	0.8 CY Backhoe Loader (1)							
	24 TN Truck End Dump (2)							
	Pickup Truck Conventional (8)							
Headworks Structure	Concrete Pump Boom Truck Mounted (1)							
	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (6)							
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)							
	Haul Truck Oversize Transport (1)							
	Pickup Truck Conventional (4)							
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)							
	100 FT Auger Track Mounted Drill Rig (1)							
	Concrete Pump Boom Truck Mounted (1)							
	Cocnrete Mixer Truck (3)							
	0.8 CY Backhoe Loader (1)							
	24 TN Truck End Dump (2)							
	Pickup Truck Conventional (8)							
						1 1		

Pedestrian Bridge Concrete Abutments	Congrete Dump Poom Truck Mounted (4)							$\overline{}$
•	Concrete Pump Boom Truck Mounted (1)							
and Wingwalls	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)							
	Flatbed Truck (2)							
	Pickup Truck Conventional (5)							
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
CMU Building and Earthwork Pad	165 HP Dozer (1)							
Construction	Scraper (1)							
	Motor Grader (1)							
	Compactor (1)							
	4000 Gal Water Truck (1)							
	10 TN Smooth Roller (1)							
	Pickup Truck Conventional (7)							
	Concrete Pump Boom Truck Mounted (1)							
	2.5" Dia. Concrete Vibrator (1)							
	Extended Boom Pallet Loader (1)							
	Concrete Mixer Truck (1)							
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)							
	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
20 -Permanent Operating Equipment	( )							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
Mechanical Hydraulic Cylinders & Housing								
Two charmout Try aradiio Cymraero a Troading	Pickup Truck Conventional (3)							
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)							
Sino Banding Moonanioa Equipment	Pickup Truck Conventional (3)							
Electrical Control Equipment CMU Buildin	. ,				+			
Electrical Power Equipment CMU Building			+ + +		+ +			_
	Pickup Truck Conventional (3)		+ + +		+ +			
Communication Equipment	in Mahitat Bastanatian & Fish Bassana Businst							

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-44. Construction Vibration Level at the Receptor												Е	stima	ted Du	uration	ı, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	3.42	0.55	1.61	1.11	1.28	1.13	2.81	2.22	2.22	1.5	1.33	2.31	4.3	3.83	4.21	4.3	3.83	3.83	3.98	2.51	0.3	n/a	0.08	0.08	0.08	0.08	1.82	0.46
Distance from the Center of Construction Activity to a Receptor (ft)	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194	194
PPV at the Receptor (in/sec)	0.16	0.03	0.07	0.05	0.06	0.05	0.13	0.10	0.10	0.07	0.06	0.11	0.20	0.18	0.19	0.20	0.18	0.18	0.18	0.12	0.01	n/a	0.00	0.00	0.00	0.00	0.08	0.02
Impact to Recepto		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	no	no	no	no	no	no
Human Annoyance	_																											
Total Lv @ 25'		103		109			117						121				120			116		n/a		86	86		114	
Distance from the Center of Construction Activity to a Receptor (ft)	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090	1090
Distance Divergence (dBA)	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2
Lv at the Receptor (VdB)	70	54	63	60	61	60	68	66	66	63	62	66	72	71	72	72	71	71	71	67	49	n/a	37	37	37	37	64	52
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	no	no	no	no	no	no

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

4200

Source: Google Earth

Table L-45. Construction Vibration and Ground-Borne Vibration

Table L-45. Construction Vibration  Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	3.5 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	_	-	6	-
09 - Channels and Canals					•			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	28	0.076	2.128	86	29	115
	Extended Boom Pallet Loader (1)	n/a	1 1	-	_	-	0	_
	Pickup Truck Conventional (1)	n/a	1	-	_	-	0	_
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	_	-	0	_
	Trailer Mounted Brush Chipper (1)	n/a	1	-	_	-	0	_
	Chainsaw (1)	n/a	1	-	_	-	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
Zhoavallon (17 ot Contaillone)	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	_	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	- 0.001	-	17	-
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Exodivation/Ordaing (Bry Conditions)	21 CY Scrapers (4)	n/a	4	-	0.000	-	12	-
	12' Blade Grader (1)	n/a	1 1	_	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	0.070	0.070	-	17	_
Earthen Backfill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Lattien Backiii	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	0.070	0.070	-	0	_
	Pickup Truck Conventional (3)	n/a	3	_		_	10	_
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2		<del>-</del>	-	6	<del>-</del>
1 (1ρταρ - Οιασο Δ	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)			0.009	0.009	01		"
	16 CY 3 Axle Dump Trucks (23)	n/a	5	0.076	1 740	- 06	14	140
Dingen Class 2	1 7	Loaded Trucks	23	0.076	1.748	86	27	113
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	n/a	2	- 0.000		-	6	- 07
	300 HP Dozer Crawler (1)	Large Bulldozer	1 5	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	<u>-</u>		_	14	
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2	_	T _	<u> </u>	6	l _
Not beduing waterial	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	0.009	0.009	07	14	07
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	0.076	1.740	00	0	113
Erosion Control Seeding	Pickup Truck Conventional (4)	n/a	4	-	_	_	12	_
15 - Floodway Control and Diversion Struc		п/а	4	-			12	
Mobilization and Demobilization		Loaded Trucks	1 44	0.076	1.064	86	22	109
INIODIIIZALION AND DEMODIIIZALION	Flatbed Truck (1 per piece of equipment)		14	0.076	1.064	00	23	109
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
Operation City December	Pickup Truck Conventional (1)	n/a	<u> </u>	- 0.070	- 0.070	-	0	-
Construction Site Dewatering	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	-	-	-	0	-
-	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	-	18	-
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	-	_	_	0	_
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	_	17	-
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
Troductive Charmer Transmen	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	_	_	0	_
Timged Bettern Cates	Haul Truck Oversize Transport (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	0.070	0.070	-	12	-
08 - Roads, Railroads, and Bridges	Tickup Truck Conventional (4)	11/4		_			12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	5	0.076	0.38	86	14	100
IMODIIIZALIOTI ATIA DEITIODIIIZALIOTI	Extended Boom Pallet Loader (1)	n/a	1	-	- 0.30	_	0	- 100
	Pickup Truck Conventional (1)	n/a	1 1	_	] -		0	
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	<del>                                     </del>	<del>                                     </del>	0	-
redesilian bridge Concrete Piles	100 FT Auger Track Mounted Drill Rig (1)			0.089	0.089	87	0	- 87
		Caisson Drilling		0.009	0.009	0/	_	07
	Concrete Pump Boom Truck Mounted (1)	n/a	1	- 0.70		-	0	-
	Cocnrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	- 0.70		-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	_	18	-

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
9	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	86	20	106
İ	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
İ	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Construction	Scraper (1)	n/a	1	-	-	-	0	-
İ	Motor Grader (1)	n/a	1	-	-	-	0	-
İ	Compactor (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
İ	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
Ì	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
İ	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
Ì	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
Ì	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
Ì	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
Ì	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
İ	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Ĺ	Temp. Mobile Office Building (1)	n/a	1	-	-	-	0	-
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
İ	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
<u>i</u>	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)	n/a	3	-	•	-	10	-
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
0 1/00 00/07/07								

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

Table L-46. Construction Vibration Level at the Receptor

<b>Building Damag</b>	je
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoya	nce
	Total Lv @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

700

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

02 - Relocations  Mobilization and Demobilization  F  E	Equipment Description  Flatbed Truck (1 per piece of equipment)  Extended Boom Pallet Loader (1)	1	2							1																		
02 - Relocations  Mobilization and Demobilization  F  E	Flatbed Truck (1 per piece of equipment)	1	2				l	I	1				I															
02 - Relocations  Mobilization and Demobilization  F  E	Flatbed Truck (1 per piece of equipment)	1	2					l																				
02 - Relocations  Mobilization and Demobilization  F  E	Flatbed Truck (1 per piece of equipment)	·		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27 28
Mobilization and Demobilization F E F										<u> </u>				1.0	<u> </u>													
E F																												
F																												
	Pickup Truck Conventional (1)																											
	3.5 CY Hydraulic Excavator (1)																											
	3.5 CY Front End Loader, Wheel (1)																											
	0.8 CY Loader/Backhoe, Wheel (1)																											
	4000 Gal Water Truck (1)																											
	16 CY 3 Axle Dump Truck (1)																											
	Pickup Truck Conventional (6)																											
	12' Blade Grader (1)	+																										
	4000 Gal Water Truck (1)																											
	Pickup Truck Conventional (1)																											
	16 CY 3 Axle Dump Truck (5)																											
l ' '	Flatbed Truck (1)																											
	Pickup Truck Conventional (2)																											
09 - Channels and Canals			_																			•		,				
	Flatbed Truck (1 per piece of equipment)																											
	Extended Boom Pallet Loader (1)																											
	Pickup Truck Conventional (1)																											
Clearing and Grubbing 1	1.5 CY Front End Loader Crawler (1)																											
  T	Trailer Mounted Brush Chipper (1)																											
	Chainsaw (1)																											
	4000 Gal Water Truck (1)																											
	Pickup Truck Conventional (6)																											
	16 CY 3 Axle Dump Truck (1)																											
	4.5 CY Hydraulic Excavator (1)																											
	300 HP Dozer (2)																											
	3.5 CY Front End Loader, Wheel (2)																											
	16 CY 3 Axle Dump Truck (9)																											
	Pickup Truck Conventional (7)																											
	300 HP Dozer (1)	+																										
	21 CY Scrapers (4)																											
	12' Blade Grader (1)																											
	4000 Gal Water Truck (1)																											
	Pickup Truck Conventional (7)																											
		+	1																									
	300 HP Dozer (1)	1																										
	4000 Gal Water Truck (1)	1																										
	10 TN Smooth Roller (1)																											
	Pickup Truck Conventional (3)	+																										
	2.5 CY Hydraulic Excavators (2)																											
	300 HP Dozer Crawler (1)	1																										
	Pickup Truck Conventional (5)	1																										
	16 CY 3 Axle Dump Trucks (23)																											
	2.5 CY Hydraulic Excavators (2)	1		T	7												7											
[	300 HP Dozer Crawler (1)																											
  F	Pickup Truck Conventional (5)	1																										
	16 CY 3 Axle Dump Trucks (23)	1																										

				1							_		
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	1											
	300 HP Dozer Crawler (1)	1											
	Pickup Truck Conventional (5)	1											
	16 CY 3 Axle Haul Trucks (23)								_				
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	1											
	Pickup Truck Conventional (4)												
15 - Floodway Control and Diversion Struc				 	 		 	 		<u>,                                      </u>		 	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)	1											
	Pickup Truck Conventional (1)												
Construction Site Dewatering	Flatbed Truck (1)	1											
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	1											
	Pickup Truck Conventional (6)												
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)												
	Pickup Truck Conventional (3)												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)												
	300 HP Dozer (2)												
	3.5 CY Front End Loader, Wheel (2)	1											
	16 CY 3 Axle Dump Truck (9)	1											
	Pickup Truck Conventional (7)												
Sheet Pile Wall	Flatbed Truck (1)												
	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)	1											
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)												
	100 FT Auger Track Mounted Drill Rig (1)	1											
	Concrete Pump Boom Truck Mounted (1)	1											
	Concrete Mixer Truck (3)	1											
	0.8 CY Backhoe Loader (1)	1											
	24 TN Truck End Dump (2)	1											
	Pickup Truck Conventional (8)												
Headworks Structure	Concrete Pump Boom Truck Mounted (1)												
	2.5" Dia. Concrete Vibrator (1)	1											
	Concrete Mixer Truck (2)	1											
	Pickup Truck Conventional (7)	1											
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)	1											
	Pickup Truck Conventional (6)	1											
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)												$\overline{}$
	Haul Truck Oversize Transport (1)	1											
	Pickup Truck Conventional (4)	1											
08 - Roads, Railroads, and Bridges	(-)												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)	1											
	Pickup Truck Conventional (1)	1											
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)		<del>     </del>										-
2.13 2.1.290 2011010101 1100	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Cocnrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												
	r lokup Truck Conventional (0)												

Pedestrian Bridge Concrete Abutments	Congrete Dump Doom Truck Mounted (1)											$\overline{}$
•	Concrete Pump Boom Truck Mounted (1)											
and Wingwalls	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)											
	Flatbed Truck (2)											
	Pickup Truck Conventional (5)											
19 - Buildings, Grounds, and Utilities												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
CMU Building and Earthwork Pad	165 HP Dozer (1)											
Construction	Scraper (1)											
	Motor Grader (1)											
	Compactor (1)											
	4000 Gal Water Truck (1)											
	10 TN Smooth Roller (1)											
	Pickup Truck Conventional (7)											
	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Extended Boom Pallet Loader (1)											
	Concrete Mixer Truck (1)											
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
20 -Permanent Operating Equipment										_	<u> </u>	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
	Temp. Mobile Office Building (1)											
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (3)											
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (3)											
Electrical Control Equipment CMU Building												
Electrical Power Equipment CMU Building												
Communication Equipment	Pickup Truck Conventional (3)											
	d Habitat Dantaration & Fish Danaga Draigat							 				

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

Table L-46. Construction Vibration Level at the Receptor												Е	stimat	ted Du	uratio	n, We	ek											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	3.42	0.55	1.61	1.11	1.28	1.13	2.81	2.38	2.38	1.66	1.66	3.33	3.49	4.85	4.21	4.3	3.83	3.83	5.82	6.18	2.14	1.84	0.08	0.08	0.08	0.08	1.82	0.46
Distance from the Center of Construction Activity to a Receptor (ft)	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
PPV at the Receptor (in/sec)	0.11	0.02	0.05	0.04	0.04	0.04	0.09	0.08	0.08	0.05	0.05	0.11	0.11	0.15	0.13	0.14	0.12	0.12	0.18	0.20	0.07	0.06	0.00	0.00	0.00	0.00	0.06	0.01
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Human Annoyance	_																											
Total Lv @ 25'	119	103	112	109	110	109	117	116	116	113	113	119	119	122	121	121	120	120	124	124	115	114	86	86	86	86	114	102
Distance from the Center of Construction Activity to a Receptor (ft)	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
Distance Divergence (dBA)	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
Lv at the Receptor (VdB)	76	60	69	66	67	66	74	72	72	69	69	75	76	79	77	78	77	77	80	81	72	70	43	43	43	43	70	58
Impact to Receptor	YES	no	no	no	no	no	YES	YES	YES	no	no	YES	YES	YES	YES	YES	YES	YES	YES	YES	no	no	no	no	no	no	no	no

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

700

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

Table L-47. Construction Vibration and Ground-Borne Vibration

Table L-47. Construction Vibration  Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations	Equipment Becomption		Equipment	(111/1000)	20 11 (111/000)	(145)	(FGD)	2011 (142)
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
Widomzalion and Bomosmzalion	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	_	l .	-	0	_
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-		_	0	
Tromone Won Bonno	3.5 CY Front End Loader, Wheel (1)	n/a	1	_	_	_	0	_
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1	_		_	0	
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)		6		1	80	•	00
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a n/a	1	-	-	-	16	<del>-</del> -
Levee Oxivi Road Regrading (6 AB)	` '	1			- 0.70	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1 -	-	-	-	0	-
T	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
09 - Channels and Canals		Ti		0.070	1 0.400			1 445
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	28	0.076	2.128	86	29	115
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1	-	-	-	0	-
	Chainsaw (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	21 CY Scrapers (4)	n/a	4	-	-	-	12	-
	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Earthen Backfill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	_	_	_	14	_
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
pp	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	3.555	_	14	]
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks		0.076	1.748	86	27	112
	TO CT 3 AXIE DUTTP TTUCKS (23)	Loaded Hucks	23	0.076	1./40	00	21	113

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2	-	l -	-	6	l - I
True Dodding Material	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	_	14	_
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
2. Goldin Golding	Pickup Truck Conventional (4)	n/a	4	_	_	_	12	_
15 - Floodway Control and Diversion Struc		1174					12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	14	0.076	1.064	86	23	109
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	_	-	0	-
Construction Site Dewatering	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
(component) comoraem,	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	-	-	-	0	-
construction one periodicing (company)	Pickup Truck Conventional (3)	n/a	3	-	_	_	10	-
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	_	-	0	_
Zacavalion (vvet conditions)	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
onest he train	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
Trodumorno Cardolaro Corrorete i mes	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	0.102	-	18	_
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	_	_	_	0	_
Trodaworko Otraolaro	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	_	_	_	0	_
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	- 0.102	-	17	-
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	n/a	1		_	_	0	_
Tredaworks Charifer Transmorr	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	0.102	_	16	
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	_	_	_	0	_
Timged Bettern Cates	Haul Truck Oversize Transport (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	-	0.070	-	12	-
08 - Roads, Railroads, and Bridges	rickap ridok conventional (1)	1174	'				12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	5	0.076	0.38	86	14	100
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	_	_	0	-
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	_	_	_	0	_
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1 1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1 1	-	-		0	
	Cocnrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1 1	-	- 0.220	-	0	55
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	0.102	]	18	
	I lovah Hack Conventional (0)	III/a	U				10	

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	86	20	106
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Construction	Scraper (1)	n/a	1	-	-	-	0	-
	Motor Grader (1)	n/a	1	-	-	-	0	-
	Compactor (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
20 -Permanent Operating Equipment		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3	-	-		10	
			•	•		•		

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-48. Construction Vibration Level at the Receptor

Building Damag	j <b>e</b>
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoya	nce
	Total Lv @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft) 700

Source: Google Earth

Table L-47. Construction Vibration	and Ground-Borne Vibration												E	stima	ted D	ıratior	ı, Wee	k			•	•							
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												ĺ
	4000 Gal Water Truck (1)																												i
	Pickup Truck Conventional (1)																												i
	16 CY 3 Axle Dump Truck (5)																												ĺ
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																												
Earthen Backfill	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
	Pickup Truck Conventional (3)																												
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	1																											
' '	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
	10 01 0 / Mic Dullip Huoko (20)											1																	

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)						$\neg \neg$
NOF Bedding Material	300 HP Dozer Crawler (1)						
	Pickup Truck Conventional (5)						
	16 CY 3 Axle Haul Trucks (23)						
Francisco Control Condino							
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)						
AF Floriday October 1 and Discouries Office	Pickup Truck Conventional (4)						
15 - Floodway Control and Diversion Structure							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)						
	Extended Boom Pallet Loader (1)						
	Pickup Truck Conventional (1)						
Construction Site Dewatering	Flatbed Truck (1)						
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)						
	Pickup Truck Conventional (6)						
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)						
	Pickup Truck Conventional (3)						
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)						
	300 HP Dozer (2)						
	3.5 CY Front End Loader, Wheel (2)						
	16 CY 3 Axle Dump Truck (9)						
	Pickup Truck Conventional (7)						
Sheet Pile Wall	Flatbed Truck (1)						
	75 TN Crane Crawler Pile Hammer (1)						
	Pickup Truck Conventional (6)						
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)						
	100 FT Auger Track Mounted Drill Rig (1)						
	Concrete Pump Boom Truck Mounted (1)						
	Concrete Mixer Truck (3)						
	0.8 CY Backhoe Loader (1)						
	24 TN Truck End Dump (2)						
	Pickup Truck Conventional (8)						
Headworks Structure	Concrete Pump Boom Truck Mounted (1)						
	2.5" Dia. Concrete Vibrator (1)						
	Concrete Mixer Truck (2)						
	Pickup Truck Conventional (7)						
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)						
	Concrete Mixer Truck (2)						
	Pickup Truck Conventional (6)						
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)						
	Haul Truck Oversize Transport (1)						
	Pickup Truck Conventional (4)						
08 - Roads, Railroads, and Bridges							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)						
	Extended Boom Pallet Loader (1)						
	Pickup Truck Conventional (1)						
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)						
	100 FT Auger Track Mounted Drill Rig (1)						
	Concrete Pump Boom Truck Mounted (1)						
	Cocnrete Mixer Truck (3)						
	0.8 CY Backhoe Loader (1)						
	24 TN Truck End Dump (2)						
	Pickup Truck Conventional (8)						
			1				

Redestrian Pridge Congrete Abutmanta	Congrete Dump Doom Trust Mounted (4)			T T		1				J		1
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)											
and Wingwalls	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)											
	Flatbed Truck (2)											
	Pickup Truck Conventional (5)											
19 - Buildings, Grounds, and Utilities									, ,			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
CMU Building and Earthwork Pad	165 HP Dozer (1)											
Construction	Scraper (1)											
	Motor Grader (1)											
	Compactor (1)											
	4000 Gal Water Truck (1)											
	10 TN Smooth Roller (1)											
	Pickup Truck Conventional (7)											
	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Extended Boom Pallet Loader (1)											
	Concrete Mixer Truck (1)											
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
20 -Permanent Operating Equipment												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Mechanical Hydraulic Cylinders & Housing	. , ,											
The charmon right and the control of the control	Pickup Truck Conventional (3)											
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)			+ +								
Tomo Banang Woonanioa Equipment	Pickup Truck Conventional (3)											
Electrical Control Equipment CMU Buildin			+ + -	+ +								
Electrical Power Equipment CMU Building				+ +								
Communication Equipment	Pickup Truck Conventional (3)			+ +								
	in the history Product Convention (a)											

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-48. Construction Vibration Level at the Receptor												Е	stima	ted D	uration	ı, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'		0.55	1.61	1.11	1.28	1.13	2.81	2.38	2.38	1.66	1.66	3.33	3.49	4.85	4.21	4.3	3.83	3.83	5.82	6.18	2.14	1.84	0.08	0.08	0.08	0.08	1.82	0.46
Distance from the Center of Construction Activity to a Receptor (ft)	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
PPV at the Receptor (in/sec)	0.11	0.02	0.05	0.04	0.04	0.04	0.09	0.08	0.08	0.05	0.05	0.11	0.11	0.15	0.13	0.14	0.12	0.12	0.18	0.20	0.07	0.06	0.00	0.00	0.00	0.00	0.06	0.01
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Human Annoyance	_																											
Total Lv @ 25'	119	103	112	109	110	109	117	116	116	113	113	119	119	122	121	121	120	120	124	124	115	114	86	86	86	86	114	102
Distance from the Center of Construction Activity to a Receptor (ft)	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
Distance Divergence (dBA)	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
Lv at the Receptor (VdB)	76	60	69	66	67	66	74	72	72	69	69	75	76	79	77	78	77	77	80	81	72	70	43	43	43	43	70	58
Impact to Receptor	YES	no	no	no	no	no	YES	YES	YES	no	no	YES	YES	YES	YES	YES	YES	YES	YES	YES	no	no	no	no	no	no	no	no

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft) 700

Source: Google Earth

## Construction Vibration - Equipment Alternative 5 - Multipe Gates/Center Alignment

Table L-49. Construction Vibration and Ground-Borne Vibration

Table L-49. Construction Vibration and Ground-Borne Vibration								
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	3.5 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	_
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
3 (1 )	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Transporary Electrical Ferrei	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	_
09 - Channels and Canals	Florap Track Conventional (2)	11/4					, and the second	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	23	0.076	1.748	86	27	113
modification and Domodification	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	
	Pickup Truck Conventional (1)	n/a	'1	_	_	_	0	_
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	_	_		0	
	Trailer Mounted Brush Chipper (1)	n/a	'1	_	_	_	0	_
	Chainsaw (1)	n/a	'1	_	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	'	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	0.070	0.070	-	16	- 00
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	0.070	0.076	00	0	00
Excavation (vvet Conditions)	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
Executive (Ozerline (Dev Ozerlitine)	3.5 CY Front End Loader, Wheel (2)	n/a	2	0.009	0.176		6	93
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.694	-		105
	Pickup Truck Conventional (7)	n/a	7	0.076	0.684	86 -	19 17	105
	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Excavation/Grading (Dry Conditions)		_	4					07
Di Qi o	21 CY Scrapers (4)	n/a	4	-	-	-	12	-
	12' Blade Grader (1)	n/a Loaded Trucks		- 0.070	- 0.070	-	0	-
	4000 Gal Water Truck (1)		1 7	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-		-	6	
	300 HP Dozer Crawler (1)	Large Bulldozer	1 1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2	-		-	6	
	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-

# Construction Vibration - Equipment Alternative 5 - Multipe Gates/Center Alignment

15 - Floodway Control and Diversion Struc	ctures							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	13	0.076	0.988	86	22	108
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Construction Site Dewatering	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	-	18	-
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (5)	n/a	5				14	-
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	5	0.076	0.38	86	14	100
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

## Construction Vibration - Equipment Alternative 5 - Multipe Gates/Center Alignment

Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Cocnrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	-	18	-
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	86	20	106
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
i	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Construction	Scraper (1)	n/a	1	-	-	-	0	-
	Motor Grader (1)	n/a	1	-	-	-	0	-
	Compactor (1)	n/a	1	-	-	-	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	_
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
	Concrete Pump Boom Truck Mounted (1)	n/a	1 1	-	-	-	0	_
	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	-	_	_	0	_
	Extended Boom Pallet Loader (1)	n/a	1 1	_	_	_	0	_
	Concrete Mixer Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1 1	-	-	-	0	-
Control of Duck Barik	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	_	_	_	0	_
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	0.102	-	17	_
20 -Permanent Operating Equipment	r ionap Tracit Conventional (1)	1.114	<u>'</u>					
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	n/a	1 1	-		-	0	-
	Pickup Truck Conventional (1)	n/a	1	_	_	_	0	_
Mechanical Hydraulic Cylinders & Housing		n/a	1	_	_	_	0	<del> </del>
	Pickup Truck Conventional (3)	n/a	3	_	_	_	10	_
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	n/a	1	_	_	_	0	<del> </del>
	Pickup Truck Conventional (3)	n/a	3	_	_	_	10	l <u>.</u>
Electrical Control Equipment CMU Building	. ,	n/a	3			-	10	
Electrical Power Equipment CMU Building		n/a	3		-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3		-	-	10	-
Communication Equipment		πια	J	•		_	10	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-50. Construction Vibration Level at the Receptor

Building Damage
Total PPV @ 25
Distance from the Center of Construction Activity to a Receptor (ft)
PPV at the Receptor (in/sec)
Impact to Receptor
luman Annoyance
Total Lv @ 25
Distance from the Center of Construction Activity to a Receptor (ft)
Distance Divergence (dBA)
Lv at the Receptor (VdB)
Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

3800 *0* 

Table L-49. Construction Vibration	and Ground-Borne Vibration												E	Estima	ated D	uratio	n, We	ek											
Phase	<b>Equipment Description</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)	1																											
	Pickup Truck Conventional (1)	1																											
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)															+													+
	Pickup Truck Conventional (2)																												
09 - Channels and Canals	10.10p 1.100.1 00.1101.101.101.101.101.101.101																												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								Т	T	I	1		T		T	T					Τ	Τ	To the second			Ι		$\top$
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	1																											+
Joseph Maria Crassing	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)	1																											
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	+																											+
Excavation (vvet conditions)	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	+	+													+	+		-										+
Excavation/Grading (Dry Conditions)	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
Dinger Class 2	Pickup Truck Conventional (7)	+																											+
Riprap - Class 2	2.5 CY Hydraulic Excavators (2) 300 HP Dozer Crawler (1)	1																	ĺ										
	• * *																												
	Pickup Truck Conventional (5)																												
DCD Dodding Material	16 CY 3 Axle Dump Trucks (23)	1																											+
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Haul Trucks (23)	1																											
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	1																											
	Pickup Truck Conventional (4)															1													

Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	
	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (1)	
Construction Site Dewatering	Flatbed Truck (1)	1
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	
	Pickup Truck Conventional (6)	
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	
	Pickup Truck Conventional (3)	
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	Т
	300 HP Dozer (2)	
	3.5 CY Front End Loader, Wheel (2)	
	16 CY 3 Axle Dump Truck (9)	
	Pickup Truck Conventional (7)	
Sheet Pile Wall	Flatbed Truck (1)	Т
	75 TN Crane Crawler Pile Hammer (1)	
	Pickup Truck Conventional (6)	
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	Т
	100 FT Auger Track Mounted Drill Rig (1)	
	Concrete Pump Boom Truck Mounted (1)	
	Concrete Mixer Truck (3)	
	0.8 CY Backhoe Loader (1)	
	24 TN Truck End Dump (2)	
	Pickup Truck Conventional (8)	
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	
	2.5" Dia. Concrete Vibrator (1)	
	Concrete Mixer Truck (2)	
	Pickup Truck Conventional (7)	
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	
	Flatbed Truck (2)	
	Pickup Truck Conventional (5)	
08 - Roads, Railroads, and Bridges		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	
	Extended Boom Pallet Loader (1)	
	Pickup Truck Conventional (1)	

Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)											
	100 FT Auger Track Mounted Drill Rig (1)											
	Concrete Pump Boom Truck Mounted (1)											
	Cocnrete Mixer Truck (3)											
	0.8 CY Backhoe Loader (1)											
	24 TN Truck End Dump (2)											
	Pickup Truck Conventional (8)											
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)											
and Wingwalls	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)											
	Flatbed Truck (2)											
	Pickup Truck Conventional (5)											
19 - Buildings, Grounds, and Utilities							<u> </u>					
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
CMU Building and Earthwork Pad	165 HP Dozer (1)											
Construction	Scraper (1)											
	Motor Grader (1)											
	Compactor (1)											
	4000 Gal Water Truck (1)											
	10 TN Smooth Roller (1)											
	Pickup Truck Conventional (7)											
	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Extended Boom Pallet Loader (1)											
	Concrete Mixer Truck (1)											
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
20 -Permanent Operating Equipment					·	·			·			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Mechanical Hydraulic Cylinders & Housing												
	Pickup Truck Conventional (3)											
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (3)											
Electrical Control Equipment CMU Buildin	g Pickup Truck Conventional (3)											
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)											
Communication Equipment	Pickup Truck Conventional (3)											
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Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-50. Construction Vibration Level at the Receptor												Е	stima	ted Du	uratio	n, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	3.19	0.55	1.55	1.99	3.47	2.61	1.9	3.74	6.49	4.86	4.14	4.39	5.73	4.86	4.14	3.83	3.83	0.53	0.47	0.15	0.15	0.15	2.28	0.15	0.99	0.91	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
PPV at the Receptor (in/sec)	0.10	0.02	0.05	0.06	0.10	0.08	0.06	0.11	0.19	0.14	0.12	0.13	0.17	0.14	0.12	0.11	0.11	0.02	0.01	0.00	0.00	0.00	0.07	0.00	0.03	0.03	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	n/a
Human Annoyance	_																											
Total Lv @ 25'						117							123			120								92			n/a	
Distance from the Center of Construction Activity to a Receptor (ft)																												
Distance Divergence (dBA)	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Lv at the Receptor (VdB)	66	50	59	61	66	64	61	67	72	69	68	69	71	69	68	67	67	50	49	39	39	39	63	39	56	55	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft) 3800

0

Table L-49. Construction Vibration	n and Ground-Borne Vibration					Estir	mated	Dura	tion, \	Neek				
Phase	Equipment Description	29	30	31	32	33	34	35	36	37	38	39	40	41
02 - Relocations														
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)													
	Extended Boom Pallet Loader (1)													
	Pickup Truck Conventional (1)													
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)													
	3.5 CY Front End Loader, Wheel (1)													
	0.8 CY Loader/Backhoe, Wheel (1)													
	4000 Gal Water Truck (1)													
	16 CY 3 Axle Dump Truck (1)													
	Pickup Truck Conventional (6)													
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)													
	4000 Gal Water Truck (1)													
	Pickup Truck Conventional (1)													
	16 CY 3 Axle Dump Truck (5)													
Temporary Electrical Power	Flatbed Truck (1)													
	Pickup Truck Conventional (2)													
09 - Channels and Canals														
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)													
	Extended Boom Pallet Loader (1)													
	Pickup Truck Conventional (1)													
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)													
	Trailer Mounted Brush Chipper (1)													
	Chainsaw (1)													
	4000 Gal Water Truck (1)													
	Pickup Truck Conventional (6)													
	16 CY 3 Axle Dump Truck (1)													
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)													
	300 HP Dozer (2)													
	3.5 CY Front End Loader, Wheel (2)													
	16 CY 3 Axle Dump Truck (9)													
	Pickup Truck Conventional (7)													
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)													
	21 CY Scrapers (4)													
	12' Blade Grader (1)													
	4000 Gal Water Truck (1)													
	Pickup Truck Conventional (7)													
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)													
	300 HP Dozer Crawler (1)													
	Pickup Truck Conventional (5)													
DOD D. LIE. M. C. L.	16 CY 3 Axle Dump Trucks (23)	1												
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)													
	300 HP Dozer Crawler (1)													
	Pickup Truck Conventional (5)													
<u> </u>	16 CY 3 Axle Haul Trucks (23)	1												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)													
	Pickup Truck Conventional (4)	<u> </u>												

15 - Floodway Control and Diversion Struc	ctures						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)						
	Extended Boom Pallet Loader (1)						ı
	Pickup Truck Conventional (1)						ı
Construction Site Dewatering	Flatbed Truck (1)						
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)						ı
,	Pickup Truck Conventional (6)						ı
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)						
3 ( 1 3)	Pickup Truck Conventional (3)						ı
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)						
, , , , , , , , , , , , , , , , , , ,	300 HP Dozer (2)						ı
	3.5 CY Front End Loader, Wheel (2)						1
	16 CY 3 Axle Dump Truck (9)						ı
	Pickup Truck Conventional (7)						ı
Sheet Pile Wall	Flatbed Truck (1)						
	75 TN Crane Crawler Pile Hammer (1)						1
	Pickup Truck Conventional (6)						1
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)						
	100 FT Auger Track Mounted Drill Rig (1)						ı
	Concrete Pump Boom Truck Mounted (1)						ı
	Concrete Mixer Truck (3)						ı
	0.8 CY Backhoe Loader (1)						1
	24 TN Truck End Dump (2)						1
	Pickup Truck Conventional (8)						
Headworks Structure	Concrete Pump Boom Truck Mounted (1)						
	2.5" Dia. Concrete Vibrator (1)						1
	Concrete Mixer Truck (2)						ı
	Pickup Truck Conventional (7)						
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)						
	Flatbed Truck (2)						ı
	Pickup Truck Conventional (5)						
08 - Roads, Railroads, and Bridges							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)						
	Extended Boom Pallet Loader (1)						ı
	Pickup Truck Conventional (1)						

Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)							
	100 FT Auger Track Mounted Drill Rig (1)							
	Concrete Pump Boom Truck Mounted (1)							
	Cocnrete Mixer Truck (3)							
	0.8 CY Backhoe Loader (1)							
	24 TN Truck End Dump (2)							
	Pickup Truck Conventional (8)							
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)							
and Wingwalls	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)							
	Flatbed Truck (2)							
	Pickup Truck Conventional (5)							
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
CMU Building and Earthwork Pad	165 HP Dozer (1)							
Construction	Scraper (1)							
	Motor Grader (1)							
	Compactor (1)							
	4000 Gal Water Truck (1)							
	10 TN Smooth Roller (1)							
	Pickup Truck Conventional (7)							
	Concrete Pump Boom Truck Mounted (1)							
	2.5" Dia. Concrete Vibrator (1)							
	Extended Boom Pallet Loader (1)							
	Concrete Mixer Truck (1)							
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)							
	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (3)							
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (3)							
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)							
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)							
Communication Equipment	Pickup Truck Conventional (3)							
O							 	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-50. Construction Vibration Level at the Receptor					Estir	nated	Durat	tion, V	Veek				
Building Damage	29	30	31	32	33	34	35	36	37	38	39	40	41
Total PPV @ 25'	1.29	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	n/a	1.29	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	260	260	260	260	260	260	260	260	260	260	260	260	260
PPV at the Receptor (in/sec)	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	0.04	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	n/a	no	n/a
Human Annoyance	_												
Total Lv @ 25'	111	92	92	92	92	92	92	92	92	92	n/a	111	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420
Distance Divergence (dBA)	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Lv at the Receptor (VdB)	58	39	39	39	39	39	39	39	39	39	n/a	58	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft) 3800

0

Table L-51. Construction Vibration and Ground-Borne Vibration

Table L-51. Construction Vibration	The state of the s			Single		Single		
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations	Equipment Description	Lookup Equipment Types	Equipment	(III/Sec)	25 it (iii/sec)	(VUB)	(VUB)	25 II (VUB)
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	I 6	0.076	0.456	86	16	102
MODIIIZALION AND DEMODIIIZALION			6	0.076	0.436	00		102
	Extended Boom Pallet Loader (1)	n/a		-	-	-	0	-
W : B	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	3.5 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
09 - Channels and Canals					•			•
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	28	0.076	2.128	86	29	115
	Extended Boom Pallet Loader (1)	n/a	1	-	_	_	0	-
	Pickup Truck Conventional (1)	n/a	1	-	_	_	0	_
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1	_	_	_	0	_
	Chainsaw (1)	n/a	1 1	_	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	'1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	0.070	0.070	_	16	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	0.070	0.070	00	0	- 00
Excavation (wet conditions)	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	1 -	2	0.009	0.176	07		93
	, , , ,	n/a	1	0.070	0.004	- 00	6	405
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9 7	0.076	0.684	86	19	105
F (	Pickup Truck Conventional (7)	n/a		-	-	-	17	-
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	21 CY Scrapers (4)	n/a	4	-	-	-	12	-
	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Earthen Backfill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-		_	14	_
			1	0.076	1 748	86		113
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	

RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2	-	l -	-	6	l - I
True Dodding Material	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	_	14	_
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
2. Goldin Golding	Pickup Truck Conventional (4)	n/a	4	_	_	_	12	_
15 - Floodway Control and Diversion Struc		1174					12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	14	0.076	1.064	86	23	109
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	_	-	0	-
Construction Site Dewatering	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
(component) comoraem,	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	-	-	-	0	-
construction one periodicing (company)	Pickup Truck Conventional (3)	n/a	3	-	_	_	10	-
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	_	-	0	_
Zacavalion (vvet conditions)	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
onest he train	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
Trodumorno Cardolaro Corrorete i mes	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	0.102	-	18	_
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	_	_	_	0	_
Trodaworko Otraolaro	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	_	_	_	0	_
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	0.102	-	17	-
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	n/a	1		_	_	0	_
Tredaworks Charifer Transmorr	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	0.102	_	16	
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	_	_	_	0	_
Timged Bettern Cates	Haul Truck Oversize Transport (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	-	0.070	-	12	-
08 - Roads, Railroads, and Bridges	rickap ridok conventional (1)	1174	'				12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	5	0.076	0.38	86	14	100
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	_	_	0	-
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	_	_	_	0	_
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1 1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1 1	-	-		0	
	Cocnrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1 1	-	- 0.220	-	0	55
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	0.102	]	18	
	I lovah Hack Conventional (0)	III/a	U				10	

Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
19 - Buildings, Grounds, and Utilities								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	86	20	106
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Construction	Scraper (1)	n/a	1	-	-	-	0	-
	Motor Grader (1)	n/a	1	-	-	-	0	-
	Compactor (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
20 -Permanent Operating Equipment		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Control Equipment CMU Building	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Electrical Power Equipment CMU Building	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3	-	-		10	
			•	•		•		

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-52. Construction Vibration Level at the Receptor

<b>Building Damage</b>	<b>)</b>
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyand	ce
	Total Lv @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

700

Table L-51. Construction Vibration	and Ground-Borne Vibration												E	Stima	ated D	uratio	n, We	ek											
																													ı
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations					•				1		1			1.0		1.0	1.0												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	+																											
Levee Odivi Noad Negrading (O Ab)	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
Tarana and Electrical Davis	16 CY 3 Axle Dump Truck (5)																-												
Temporary Electrical Power	Flatbed Truck (1)																												
22 21 1 12 1	Pickup Truck Conventional (2)																												
09 - Channels and Canals											1	<u> </u>			<u> </u>	<u> </u>	1	T	T			<u> </u>	1	<u> </u>		1	1 1		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																												
Earthen Backfill	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
	Pickup Truck Conventional (3)																												
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	1																											
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
		1																											
	16 CY 3 Axle Dump Trucks (23)							1																					

	In a post of the second of the			_								1	
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)												
	300 HP Dozer Crawler (1)												
	Pickup Truck Conventional (5)												
	16 CY 3 Axle Haul Trucks (23)												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)												
	Pickup Truck Conventional (4)												
15 - Floodway Control and Diversion Struc					<u>,                                      </u>		 		 				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Construction Site Dewatering	Flatbed Truck (1)												
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)												
	Pickup Truck Conventional (3)												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)												
, , ,	300 HP Dozer (2)												
	3.5 CY Front End Loader, Wheel (2)												
	16 CY 3 Axle Dump Truck (9)		ï										
	Pickup Truck Conventional (7)		ï										
Sheet Pile Wall	Flatbed Truck (1)												$\neg$
	75 TN Crane Crawler Pile Hammer (1)												
	Pickup Truck Conventional (6)												
Headworks Structure Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)												
	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Concrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												
Headworks Structure	Concrete Pump Boom Truck Mounted (1)												-
	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (7)												
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)												$\overline{}$
Trodaworks orialinor transmen	Concrete Mixer Truck (2)												
	Pickup Truck Conventional (6)												
Hinged Bottom Gates	90 TN Truck Mounted Hydraulic Crane (1)							+					-
Timged Bottom Gates	Haul Truck Oversize Transport (1)												
	Pickup Truck Conventional (4)												
08 - Roads, Railroads, and Bridges	Tickup Truck Conventional (4)												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)					_	T T						
Woomzation and Demoonization	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
Pedestrian Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)			+									$\dashv$
Tredestrial bridge collete Files	100 FT Auger Track Mounted Drill Rig (1)												
	Concrete Pump Boom Truck Mounted (1)												
	Cocnrete Mixer Truck (3)												
	0.8 CY Backhoe Loader (1)												
	24 TN Truck End Dump (2)												
	Pickup Truck Conventional (8)												

D I I D'I O I AI I I	TO ( D D T 1M ( 1/4)					1	т т					
Pedestrian Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)											
and Wingwalls	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
Pedestrian Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)											
	Flatbed Truck (2)											
	Pickup Truck Conventional (5)											
19 - Buildings, Grounds, and Utilities												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
CMU Building and Earthwork Pad	165 HP Dozer (1)											
Construction	Scraper (1)											
	Motor Grader (1)											
	Compactor (1)											
	4000 Gal Water Truck (1)											
	10 TN Smooth Roller (1)											
	Pickup Truck Conventional (7)											
	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Extended Boom Pallet Loader (1)											
	Concrete Mixer Truck (1)											
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
20 -Permanent Operating Equipment					,			 				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Mechanical Hydraulic Cylinders & Housing												
	Pickup Truck Conventional (3)											
CMU Building Mechanical Equipment	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (3)											
Electrical Control Equipment CMU Building												
Electrical Power Equipment CMU Building												
Communication Equipment	Pickup Truck Conventional (3)											
	Allahitat Dantantian & Fish Danasan Duniant											

Considerations. March 10.

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-52. Construction Vibration Level at the Receptor												Е	stimat	ted Du	uratio	n, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	3.42	1.61	1.27	1.11	1.42	1.27	2.28	1.35	0.63	0.79	4.85	4.85	5.23	5.32	5.01	4.85	5.01	5.23	5.01	6.54	6.37	1.84	1.91	2.2	0.08	0.08	0.46	1.82
Distance from the Center of Construction Activity to a Receptor (ft)	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
PPV at the Receptor (in/sec)	0.10	0.05	0.04	0.03	0.04	0.04	0.07	0.04	0.02	0.02	0.14	0.14	0.16	0.16	0.15	0.14	0.15	0.16	0.15	0.19	0.19	0.05	0.06	0.07	0.00	0.00	0.01	0.05
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Human Annoyance	_																											
Total Lv @ 25'	119	112	110	109	111			111					123				122	123	122	125	124	114	114	115	86	86	102	114
Distance from the Center of Construction Activity to a Receptor (ft)	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
Distance Divergence (dBA)	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
Lv at the Receptor (VdB)	76	69	67	66	68	67	72	67	61	63	79	79	79	79	79	79	79	79	79	81	81	70	71	72	43	43	58	70
Impact to Receptor	YES	no	no	no	no	no	no	no	no	no	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	no	no	no	no	no	no	no

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft) 700

#### **Construction Vibration - Equipment** Downstream (Alternatives 1-4, 6)

Table L-53 Construction Vibration and Ground-Borne Vibration

Phase	n and Ground-Borne Vibration  Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations	And a second	The state of the s	4.54	( 2222)	1 ( 3333)	( )		
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	14	0.076	1.064	86	23	109
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
, ,	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
09 - Channels and Canals					<u> </u>			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	108	0.076	8.208	86	41	127
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1 1	_	_	_	0	_
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	_	_	_	0	_
Cicaring and Crabbing	Trailer Mounted Brush Chipper (1)	n/a	1	_	_	_	0	_
	Chainsaw (1)	n/a		_	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	'1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	0.070	0.070	-	16	_
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	0.070	0.070		0	- 00
Excavation (vvet Conditions)	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	` '	_		0.069	0.176	07		93
	3.5 CY Front End Loader, Wheel (2) 16 CY 3 Axle Dump Truck (9)	n/a	2	0.070	0.004	- 00	6	105
		Loaded Trucks	9 7	0.076	0.684	86	19	105
Forth on Doct-fill	Pickup Truck Conventional (7)	n/a	· ·	- 0.000	- 0.000	- 07	17	- 07
Earthen Backfill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1	-	-	-	0	-
D: Ol o	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	-	6	-
	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	-	14	-
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	-	-	0	-
11 Lavage and Flandwalls	Pickup Truck Conventional (4)	n/a	4	-	<u> </u>	-	12	<u> </u>
11-Levees and Floodwalls	T	T – .	1	Γ	T	·		T
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	14	0.076	1.064	86	23	109
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1		-	-	0	-
Soil Cement Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	2.5 CY Hydraulic Excavators (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Flash Mixer (1)	n/a	1	-	_	-	0	-
	Slurry Pump (1)	n/a	1	_	_	-	0	-
	Pickup Truck Conventional (5)	n/a	5		1	1	14	1

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

- Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

### Construction Vibration - Equipment Downstream (Alternatives 1-4, 6)

Table L-54. Construction Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
Distan	ce from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
Distan	ce from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

7000

### **Construction Vibration - Equipment** Downstream (Alternatives 1-4, 6)

Table L-53. Construction Vibration	and Ground-Borne Vibration	n Estimated Duration, Week																												
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	)   11	1:	2   1	3   1	4	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																														
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																													
	Extended Boom Pallet Loader (1)																												,	
	Pickup Truck Conventional (1)																													
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												ļ	
	4000 Gal Water Truck (1)																												,	
	Pickup Truck Conventional (1)																												,	
	16 CY 3 Axle Dump Truck (5)																													
Temporary Electrical Power	Flatbed Truck (1)																												ļ	
	Pickup Truck Conventional (2)																													
09 - Channels and Canals							1																							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												ļ	
	Extended Boom Pallet Loader (1)																												ļ	
	Pickup Truck Conventional (1)														_															
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												ļ	
	Trailer Mounted Brush Chipper (1)																												,	
	Chainsaw (1)																												ļ	
	4000 Gal Water Truck (1)																												,	
	Pickup Truck Conventional (6)																												ļ	
Francisco (Mat Occalitica)	16 CY 3 Axle Dump Truck (1)																													
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												ļ	
	300 HP Dozer (2)																												ļ	
	3.5 CY Front End Loader, Wheel (2)																												ļ	
	16 CY 3 Axle Dump Truck (9)																												,	
Earthen Backfill	Pickup Truck Conventional (7) 300 HP Dozer (1)																													
Earthen Backilli	4000 Gal Water Truck (1)																												ļ	
	10 TN Smooth Roller (1)																												,	
	Pickup Truck Conventional (3)																												ļ	
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																											$\longrightarrow$		
111prap - Glass 2	300 HP Dozer Crawler (1)																												,	
	Pickup Truck Conventional (5)																												ļ	
	16 CY 3 Axle Dump Trucks (23)																												ļ	
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)																									+				
Troi Bodding Material	300 HP Dozer Crawler (1)																												ļ	
	Pickup Truck Conventional (5)																												ļ	
	16 CY 3 Axle Haul Trucks (23)																												ļ	
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																											-		
_	Pickup Truck Conventional (4)																												ļ	
11-Levees and Floodwalls																							1	T	T		, ,			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												ļ	
	Extended Boom Pallet Loader (1)																												ļ	
	Pickup Truck Conventional (1)																												ļ	
Soil Cement Bentonite Cutoff Wall	4.5 CY Hydraulic Excavator (1)																													
	300 HP Dozer (1)																												ļ	
	2.5 CY Hydraulic Excavators (1)																												ļ	
	16 CY 3 Axle Dump Truck (1)																												ļ	
	Flash Mixer (1)																												ļ	
	Slurry Pump (1)																												ļ	
	Pickup Truck Conventional (5)																												ļ	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

- Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Considerations. March 10.

#### **Construction Vibration - Equipment** Downstream (Alternatives 1-4, 6)

Table L-54. Construction Vibration Level at the Receptor												Е	stima	ted Du	ıratio	n, We	ek											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	9.35	0.15	0.15	0.15	0.15	0.86	1.03	1.03	1.93	1.03	1.03	1.03	2.9	3.67	3.67	3.67	3.67	3.67	1.84	n/a	n/a	8.21	0.46	1.06	n/a	n/a	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)								330									330								330	330	330	330
PPV at the Receptor (in/sec)	0.19	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.06	0.08	0.08	0.08	0.08	0.08	0.04	n/a	n/a	0.17	0.01	0.02	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	n/a	no	no	no	n/a	n/a	n/a	n/a
Human Annoyance	_																											
Total Lv @ 25'				92	92	107			107					120		120					n/a						n/a	
Distance from the Center of Construction Activity to a Receptor (ft)	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820
Distance Divergence (dBA)	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9
Lv at the Receptor (VdB)	72	36	36	36	36	51	53	53	51	51	51	51	58	64	64	64	64	64	58	n/a	n/a	71	46	53	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	n/a	no	no	no	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

Significance Level
Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

7000

Table L-55. Construction Vibration and Ground-Borne Vibration

Table L-55. Construction Vibration	and Ground-Borne vibration	_			г		ı	
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations				,		,	, ,	,
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	_	-	0	_
	Pickup Truck Conventional (1)	n/a	1	-	_	-	0	_
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	3.5 CY Front End Loader, Wheel (1)	n/a	1	-	_	-	0	
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1 1	-	_	-	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	_	_	6	_
09 - Channels and Canals	(-							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	23	0.076	1.748	86	27	113
	Extended Boom Pallet Loader (1)	n/a	1	-	_	-	0	_
	Pickup Truck Conventional (1)	n/a	1	_	_	_	0	_
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1 1	-	_	-	0	_
	Chainsaw (1)	n/a	1	_	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	21 CY Scrapers (4)	n/a	4	-	-	-	12	-
	12' Blade Grader (1)	n/a	1	_	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	n/a	2	-	_	-	6	_
Thirtipi Glade o	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	0.000	- 0.003		14	
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	23	-	1.740	-	6	- 113
To beduing waterial	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	In/a	5	0.009	0.069	07	14	07
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	1.740	-	0	- 113
Liosion Control Seeding	Pickup Truck Conventional (4)	n/a	4	-	-		12	[
	Fickup Truck Conventional (4)	μινα	<del>  4</del>	-	<u> </u>	_	12	_

15 - Floodway Control and Diversion Struct	ures							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Haul Truck Oversize Transport (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	3	0.076	0.228	86	10	96
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

Table L-56. Construction Vibration Level at the Receptor

<b>Building Damage</b>	
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyand	ee
	Total Lv @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

1800

Table L-55. Construction Vibration	and Ground-Borne Vibration													Estim	ated D	uratio	n, We	ek											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)															1													
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	1																											
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Haul Trucks (23)	<u> </u>																											
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												
	Pickup Truck Conventional (4)	1								1																			

15 - Floodway Control and Diversion Struct	ures								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								
	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (1)								
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)								
	75 TN Crane Crawler Pile Hammer (1)								
	Pickup Truck Conventional (6)								
Sheet Pile Wall	Flatbed Truck (1)								
	75 TN Crane Crawler Pile Hammer (1)								
	Pickup Truck Conventional (6)								
Headworks Structure	Concrete Pump Boom Truck Mounted (1)								
	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (7)								
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)								
	Concrete Mixer Truck (2)								
	Pickup Truck Conventional (6)								
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)								
	Haul Truck Oversize Transport (1)								
	Pickup Truck Conventional (4)								
20 -Permanent Operating Equipment									
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)								
	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (1)								
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)								
	Pickup Truck Conventional (3)								

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

Table L-56. Construction Vibration Level at the Receptor												Е	stima	ted Du	uration	ո, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	0.53	0.15	1.75	0.15	0.86	0.17	3.67	n/a					0.23	0.08	0.46	0.23	n/a	n/a	0.23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.46	0.46
Distance from the Center of Construction Activity to a Receptor (ft)	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
PPV at the Receptor (in/sec)	0.03	0.01	0.09	0.01	0.04	0.01	0.19	n/a	0.11	0.04	0.04	0.01	0.01	0.00	0.02	0.01	n/a	n/a	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.02	0.02
Impact to Receptor	no	no	no	no	no	no	no	n/a	no	no	no	no	no	no	no	no	n/a	n/a	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a	no	no
Human Annoyance	_																											
Total Lv @ 25'			113		107			n/a	115					86	102		n/a	n/a	96	n/a			n/a		n/a			
Distance from the Center of Construction Activity to a Receptor (ft)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Distance Divergence (dBA)	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7	55.7
Lv at the Receptor (VdB)	47	36	58	36	51	37	64	n/a	60	49	49	36	40	30	46	40	n/a	n/a	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	46	46
Impact to Receptor	no	no	no	no	no	no	no	n/a	no	no	no	no	no	no	no	no	n/a	n/a	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a	no	no

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

1800

Table L-57. Construction Vibration and Ground-Borne Vibration

Table L-57. Construction Vibration	and Ground-Borne vibration	_			г		ı	1
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations	The first section of the first	The state of the s	1	( 2222)	1 ( 1111)	,		,
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	_	_	0	_
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	3.5 CY Front End Loader, Wheel (1)	n/a	1 1	-	_	-	0	-
	0.8 CY Loader/Backhoe, Wheel (1)	n/a	1 1	-	_	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1 1	-	_	_	0	_
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	_	_	6	_
09 - Channels and Canals	(-							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	23	0.076	1.748	86	27	113
	Extended Boom Pallet Loader (1)	n/a	1	-	_	-	0	_
	Pickup Truck Conventional (1)	n/a	1 1	-	_	_	0	_
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1 1	-	_	-	0	-
	Chainsaw (1)	n/a	1 1	-	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	21 CY Scrapers (4)	n/a	4	-	-	-	12	-
	12' Blade Grader (1)	n/a	1 1	-	_	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	_	_	17	_
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)	n/a	2	_	_	_	6	_
The state of	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	-	-	_	14	-
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	n/a	2.3	-	1.740	_	6	- 113
The Bodding Material	300 HP Dozer Crawler (1)	Large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	In/a	5	-	0.069	"-	14	',
	16 CY 3 Axle Haul Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	1.770	-	0	- 113
Listing Control Cocuring	Pickup Truck Conventional (4)	n/a	4	_	_		12	
	i lokup Huok Conventional (4)	πα	1 4	_	<u> </u>	_	14	

15 - Floodway Control and Diversion Struct	ures							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	6	0.076	0.456	86	16	102
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Headworks Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Haul Truck Oversize Transport (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-
20 -Permanent Operating Equipment								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	3	0.076	0.228	86	10	96
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

Table L-58. Construction Vibration Level at the Receptor

<b>Building Damage</b>	,
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
<b>Human Annoyand</b>	ce
	Total Lv @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

8600

Table L-57. Construction Vibration	and Ground-Borne Vibration													Estim	ated D	uratio	n, We	ek											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Fremont Weir Demo	3.5 CY Hydraulic Excavator (1)																												
	3.5 CY Front End Loader, Wheel (1)																												
	0.8 CY Loader/Backhoe, Wheel (1)																												
	4000 Gal Water Truck (1)																												
	16 CY 3 Axle Dump Truck (1)																												
	Pickup Truck Conventional (6)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)																												
	Pickup Truck Conventional (2)																												
09 - Channels and Canals																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												
	21 CY Scrapers (4)																												
	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (7)																												
Riprap - Class 3	2.5 CY Hydraulic Excavators (2)																												
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Dump Trucks (23)																												
RSP Bedding Material	2.5 CY Hydraulic Excavators (2)	1														1													
	300 HP Dozer Crawler (1)																												
	Pickup Truck Conventional (5)																												
	16 CY 3 Axle Haul Trucks (23)																												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																											Ţ	_
	Pickup Truck Conventional (4)	1				1				I						1													

15 - Floodway Control and Diversion Struc	tures										
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)										
	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (1)										
Excavation/Grading (Dry Conditions)	Flatbed Truck (1)										
	75 TN Crane Crawler Pile Hammer (1)										
	Pickup Truck Conventional (6)										
Sheet Pile Wall	Flatbed Truck (1)										
	75 TN Crane Crawler Pile Hammer (1)										
	Pickup Truck Conventional (6)										
Headworks Structure	Concrete Pump Boom Truck Mounted (1)										
	2.5" Dia. Concrete Vibrator (1)										
	Concrete Mixer Truck (2)										
	Pickup Truck Conventional (7)										
Headworks Channel Transition	2.5" Dia. Concrete Vibrator (1)										
	Concrete Mixer Truck (2)										
	Pickup Truck Conventional (6)										
Hinged Bottom Gates	40 TN Truck Mounted Hydraulic Crane (1)										
	Haul Truck Oversize Transport (1)										
	Pickup Truck Conventional (4)										
20 -Permanent Operating Equipment											
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)										
	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (1)										
Mechanical Hydraulic Cylinders & Housing	Extended Boom Pallet Loader (1)										
	Pickup Truck Conventional (3)										

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Table L-58. Construction Vibration Level at the Receptor												Е	stima	ted Du	ıratior	ı, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	0.53	0.15	1.75	0.15	0.86	0.17	3.67	n/a	2.2	0.72	0.72	0.15	0.23	0.08	0.46	0.23	n/a	n/a	0.23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.46	0.46
Distance from the Center of Construction Activity to a Receptor (ft)	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
PPV at the Receptor (in/sec)	0.03	0.01	0.09	0.01	0.04	0.01	0.19	n/a	0.11	0.04	0.04	0.01	0.01	0.00	0.02	0.01	n/a	n/a	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.02	0.02
Impact to Receptor	no	no	no	no	no	no	no	n/a	no	no	no	no	no	no	no	no	n/a	n/a	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a	no	no
Human Annoyance																												
Total Lv @ 25'				92	107	93			115			92			102		n/a				n/a	n/a	n/a	n/a	n/a	n/a	102	102
Distance from the Center of Construction Activity to a Receptor (ft)																980					980			980				980
Distance Divergence (dBA)	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8
Lv at the Receptor (VdB)	55	44	65	44	59	45	72	n/a	67	57	57	44	48	38	54	48	n/a	n/a	48	n/a	n/a	n/a	n/a	n/a	n/a	n/a	54	54
Impact to Receptor	no	no	no	no	no	no	no	n/a	no	no	no	no	no	no	no	no	n/a	n/a	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a	no	no

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

8600

# Construction Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)

Table L-59. Construction Vibration and Ground-Borne Vibration

Table L-59. Construction Vibration a	and Ground-Borne Vibration	1		<u> </u>	1	<u> </u>		
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	3	0.076	0.228	86	10	96
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
09 - Channels and Canals								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	11	0.076	0.836	86	21	107
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1	-	-	-	0	-
	Chainsaw (1)	n/a	1	-	_	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	_	_	16	_
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	- 0.001	-	17	-
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	_	_	0	_
Licolori Control Gecamy	Pickup Truck Conventional (4)	n/a	4	_	_	_	12	_
11 - Levees and Flood walls	rickup fruck Conventional (4)	11/4					12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
INIODIIIZATION AND DEMODIIIZATION	Extended Boom Pallet Loader (1)	n/a	1 1	0.070	0.504	-	0	-
	Pickup Truck Conventional (3)	n/a	3	_		_	10	
Reinforced AG Berm	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Intelliloided AG Bellil	4000 Gal Water Truck (1)	Loaded Trucks	'1	0.076	0.039	86	0	86
	10 TN Smooth Roller (1)	n/a	1 1	0.070	0.070	-	0	- 00
	Pickup Truck Conventional (3)	n/a	3	_	_	_	10	_
15 - Floodway Control and Diversion Struc		liva		-	_	_	10	_
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	12	0.076	0.912	86	22	108
INIODINIZATION AND DEMINDRINIZATION	Extended Boom Pallet Loader (1)	n/a	1 1	-	0.312		0	100
	Pickup Truck Conventional (1)	n/a		- -	]	-	0	
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	-	-	-	0	<del>                                     </del>
Construction Site Dewatering (Pumping)	Pickup Truck Conventional (3)	n/a n/a	3				10	-
Eventuation (Met Conditions)			1	-	-	-		<del>-</del>
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a				-	0	-
	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	- 0.70	0.004	-	6	405
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-

#### **Construction Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)**

Concrete Turnout Structure	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	_
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	_	_	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
36-Inch RCP	25 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-
Trashrack	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Screw Gate	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Outlet Fish Screen	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Concrete Emergency Spillway	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Concrete Connection Vault	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Haul Truck Oversize Transport (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
08 - Roads, Railroads, and Bridges								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	5	0.076	0.38	86	14	100
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	100 FT Auger Track Mounted Drill Rig (1)	Caisson Drilling	1	0.089	0.089	87	0	87
	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	Cocnrete Mixer Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	0.8 CY Backhoe Loader (1)	n/a	1	-	-	-	0	-
	24 TN Truck End Dump (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (8)	n/a	8	-	-	-	18	-
Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
and Wingwalls	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	
Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
0	Pickup Truck Conventional (5)	n/a	5	-		-	14	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

— Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

### Construction Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)

Table L-60. Construction Vibration Level at the Receptor

uilding Damage
Total PPV @ 25
Distance from the Center of Construction Activity to a Receptor (ft
PPV at the Receptor (in/sec
Impact to Receptor
uman Annoyance
Total Lv @ 25
Distance from the Center of Construction Activity to a Receptor (ft
Distance Divergence (dBA)
Lv at the Receptor (VdB)
Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

8000

# Construction Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)

Table L-59. Construction Vibration a	and Ground-Borne Vibration												E	Stima	ated D	uratio	n, Wee	ek											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations														1 1		1				1			<u> </u>						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (1)																												
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)																												
, ,	Pickup Truck Conventional (2)																												
09 - Channels and Canals																•													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												
	Trailer Mounted Brush Chipper (1)																												
	Chainsaw (1)																												
	4000 Gal Water Truck (1)																												
	Pickup Truck Conventional (6)																												
	16 CY 3 Axle Dump Truck (1)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												
	Pickup Truck Conventional (4)																												
11 - Levees and Flood walls																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (3)																												
Reinforced AG Berm	300 HP Dozer (1)																												
	4000 Gal Water Truck (1)																												
	10 TN Smooth Roller (1)																												
	Pickup Truck Conventional (3)																												
15 - Floodway Control and Diversion Struc																							1						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)	<u> </u>																											
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)																												
	Pickup Truck Conventional (3)																												
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)																												
	300 HP Dozer (2)																												
	3.5 CY Front End Loader, Wheel (2)																												
	16 CY 3 Axle Dump Truck (9)																												
	Pickup Truck Conventional (7)																												

## Construction Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)

Concrete Turnout Structure	Concrete Pump Boom Truck Mounted (1)							
Concrete Turnout Structure	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
36-Inch RCP	25 TN Truck Mounted Hydraulic Crane (1)							
30-IIICII RCP	Flatbed Truck (1)							
	Pickup Truck Conventional (4)							
Tueshusel								
Trashrack	Flatbed Truck (1)							
0	Pickup Truck Conventional (2)							
Screw Gate	Flatbed Truck (1)							
0.11.45:1-0	Pickup Truck Conventional (2)							
Outlet Fish Screen	Flatbed Truck (1)							
	Pickup Truck Conventional (2)							
Concrete Emergency Spillway	Concrete Pump Boom Truck Mounted (1)							
	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
Concrete Connection Vault	40 TN Truck Mounted Hydraulic Crane (1)							
	Haul Truck Oversize Transport (1)							
	Pickup Truck Conventional (3)							
08 - Roads, Railroads, and Bridges					 			 
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)							
	Extended Boom Pallet Loader (1)							
	Pickup Truck Conventional (1)							
Bridge Concrete Piles	40 TN Truck Mounted Hydraulic Crane (1)							
	100 FT Auger Track Mounted Drill Rig (1)							
	Concrete Pump Boom Truck Mounted (1)							
	Cocnrete Mixer Truck (3)							
	0.8 CY Backhoe Loader (1)							
	24 TN Truck End Dump (2)							
	Pickup Truck Conventional (8)							
Bridge Concrete Abutments	Concrete Pump Boom Truck Mounted (1)							
and Wingwalls	2.5" Dia. Concrete Vibrator (1)							
	Concrete Mixer Truck (2)							
	Pickup Truck Conventional (7)							
Bridge Span Installation	90 TN Truck Mounted Hydraulic Crane (1)							
	Flatbed Truck (2)							
	Pickup Truck Conventional (5)							
0 1/00 00/7 1/1 0 0 1	nonid Habitat Postaration & Fish Passage Project	 	 1 1	 			1	1

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Constructability and Construction

Considerations. March 10.

## Construction Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)

Table L-60. Construction Vibration Level at the Receptor												Е	stima	ted Du	uration	ı, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	1.14	0.15	0.86	n/a	n/a	0.84	0.3	0.17	0.3	0.91	0.86	0.15	0.08	0.08	0.23	0.23	0.38	1.38	0.15	0.15	n/a	0.84	0.23	n/a	n/a	n/a	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	100	100	100	100	100		100		100				100				100			100			100		100	100	100	100
PPV at the Receptor (in/sec)	0.14	0.02	0.11	n/a	n/a	0.10	0.04	0.02	0.04	0.11	0.11	0.02	0.01	0.01	0.03	0.03	0.05	0.17	0.02	0.02	n/a	0.10	0.03	n/a	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	n/a	n/a	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	no	no	n/a	n/a	n/a	n/a	n/a
Human Annoyance																												
Total Lv @ 25'		92	107	n/a	n/a	107	98	93	98	108	107	92	86	86	96	96	100	111	92	92	n/a	107	96	n/a	n/a	n/a	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510									510	
Distance Divergence (dBA)	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
Lv at the Receptor (VdB)	70	53	68	n/a	n/a	68	59	53	59	68	68	53	47	47	56	56	61	72	53	53	n/a	68	56	n/a	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	n/a	n/a	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	no	no	n/a	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

8000

## Construction Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-61. Construction Vibration and Ground-Borne Vibration

Table L-61. Construction Vibration	and Ground-Borne Vibration			0:		0: 1		
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations								
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	3	0.076	0.228	86	10	96
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
09 - Channels and Canals		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	15	0.076	1.14	86	24	110
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	Trailer Mounted Brush Chipper (1)	n/a	1	-	_	-	0	_
	Chainsaw (1)	n/a	1 1	-	_	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	_	_	16	_
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	large Bulldozer	1	0.089	0.089	87	0	87
	21 CY Scrapers (4)	n/a	4	-	-	-	12	-
	12' Blade Grader (1)	n/a	1	-	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-	_	_	6	<del>-</del>
Triprap Glado Z	300 HP Dozer Crawler (1)	large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	0.000	0.000	-	14	-
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	1.740	-	0	
Liosion Control Seeding	Pickup Truck Conventional (4)	n/a	4	_		_	12	1 -
11 - Levees and Flood walls	Tickup Truck Conventional (4)	II/a					12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	n/a	1	0.070	0.504	-	0	
	Pickup Truck Conventional (3)	n/a	3	_	_	_	10	1 _
Berm/ Levee Fill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Beilii/ Levee Fili	4000 Gal Water Truck (1)	Loaded Trucks		0.089	0.009	86	0	86
	10 TN Smooth Roller (1)	n/a		0.076	0.076	-	0	00
	Pickup Truck Conventional (3)	n/a	3	_	_	_	10	_
15 - Floodway Control and Diversion Stru		liva	<u> </u>	-			IU	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	12	0.076	0.912	86	22	108
INIODIIIZAUOTI AHU DEHIODIIIZAUOH	Extended Boom Pallet Loader (1)		14	0.076	0.912	00	0	100
	` '	n/a		-	· ·	_	_	1 -
Construction Site Dewatering	Pickup Truck Conventional (1)	n/a Loaded Trucks	1 1	0.070	0.070	- 86	0	
•	Flatbed Truck (1)	I .	1	0.076	0.076		0	86
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)		0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	-	_	-	16	_

## Construction Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	ln/a	1	_	_	_	0	I -
Construction One Dematering (Fumping)	Pickup Truck Conventional (3)	n/a	3	_	_	_	10	_
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	n/a	1		_	_	0	
Executation (vvet conditions)	300 HP Dozer (2)	Large Bulldozer	2	0.089	0.178	87	6	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	-	-	_	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9	0.076	0.684	86	19	105
	Pickup Truck Conventional (7)	n/a	7	0.070	0.004	"-	17	-
Sheet Pile Wall	Flatbed Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
Officer i lie vvali	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1 1	0.644	0.644	104	0	104
	Pickup Truck Conventional (6)	n/a	6	0.044	0.044	104	16	-
Culvert Head Wall	2.5" Dia. Concrete Vibrator (1)	n/a	1	_	_		0	_
Odivert Fledd Wall	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	0.070	0.132	-	16	- 32
Precast Box Culvert 10'x8'x30'	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1 1	_	_	<del>-</del>	0	_
Trecast box outvert 10 x0 x30	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (4)	n/a	4	0.070	0.132	00	12	32
Water Control Structure	2.5" Dia. Concrete Vibrator (1)	n/a	1	_	_	<del>-</del>	0	_
Water Control Structure	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	0.076	0.152	00	16	92
Inflatable Obermeyer Gates	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	<del>                                     </del>	-	<del>-</del>	0	-
Initialable Obernleyer Gales	Haul Truck Oversize Transport (1)	Loaded Trucks		0.076	0.076	86	0	86
	Pickup Truck Conventional (4)		4	0.076	0.076	00	12	00
19 - Buildings, Grounds, and Utilities	Pickup Truck Conventional (4)	n/a	4	-			12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	l 06	20	106
	Extended Boom Pallet Loader (1)	n/a	10	0.076	0.76	86	0	106
	Pickup Truck Conventional (1)	n/a		-	-	_	0	-
	Temp. Mobile Office Building (1)	n/a	1 1	-			0	-
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer	1 1	0.089	0.089	87	0	87
Construction	Scraper (1)	1 -		0.069	0.009	07	0	07
Construction	Motor Grader (1)	n/a In/a		-	-	-	0	-
	` '			-	-	-	0	-
	Compactor (1)	n/a	1 1	0.070	0.070	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks		0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a		-	-	-	ľ	-
	Pickup Truck Conventional (7)	n/a	/	-	-	-	17	-
	Concrete Pump Boom Truck Mounted (1)	n/a	1 1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Extended Boom Pallet Loader (1)	n/a	1	-		-	0	-
	Concrete Mixer Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1	-	-	-	0	-
	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (7)	n/a	7	-	-	-	17	-
20 -Permanent Operating Equipment			_					
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	3	0.076	0.228	86	10	96
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Power, Electrical, & Mechanical Equipmen	` '	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

### **Construction Vibration - Equipment** Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-62. Construction Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
Dist	tance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
Dist	tance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

2600

Receptors:

Nearest residential receptor (ft)

# Construction Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (A

Table L-61. Construction Vibration	and Ground-Borne Vibration												I	Estima	ated D	uratio	n, We	ek											
Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
02 - Relocations																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												1
	Extended Boom Pallet Loader (1)																												1
	Pickup Truck Conventional (1)																												
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)																												ı
	4000 Gal Water Truck (1)																												ı
	Pickup Truck Conventional (1)																												i
	16 CY 3 Axle Dump Truck (5)																												
Temporary Electrical Power	Flatbed Truck (1)																												ı
	Pickup Truck Conventional (2)																												
09 - Channels and Canals							_															_	_						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												,
	Extended Boom Pallet Loader (1)																												ı
	Pickup Truck Conventional (1)																												
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)																												1
	Trailer Mounted Brush Chipper (1)																												1
	Chainsaw (1)																												1
	4000 Gal Water Truck (1)																												1
	Pickup Truck Conventional (6)																												1
	16 CY 3 Axle Dump Truck (1)	ļ																											
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)																												1
	21 CY Scrapers (4)																												1
	12' Blade Grader (1)																												ı
	4000 Gal Water Truck (1)																												i
D: Ol o	Pickup Truck Conventional (7)																												
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)																												1
	300 HP Dozer Crawler (1)																												1
	Pickup Truck Conventional (5)																												1
F : 0 : 10 E	16 CY 3 Axle Dump Trucks (23)																												
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)																												ı
11 - Levees and Flood walls	Pickup Truck Conventional (4)																												
	Flath ad Truck (4 non piece of continuous)		T			1	Т	1	_			1					1	Т	ı		1				T	T			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment) Extended Boom Pallet Loader (1)																												i
	Pickup Truck Conventional (3)																												ı
Berm/ Levee Fill	300 HP Dozer (1)																												
Beilii/ Levee Fili	4000 Gal Water Truck (1)																												i
	10 TN Smooth Roller (1)																												1
	Pickup Truck Conventional (3)																												i
15 - Floodway Control and Diversion Stru																													
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)		T T										T																
MODINZALION AND DEMODINZALION	Extended Boom Pallet Loader (1)																												
	Pickup Truck Conventional (1)																												
Construction Site Dewatering	Flatbed Truck (1)	+													+														
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)																												1
(13porary contractin)	Pickup Truck Conventional (6)																												
	i lokup Truck Conventional (0)	1		1			1						1																

## Construction Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (A

	Iou p: p = : p : (t)								-			
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)											
	Pickup Truck Conventional (3)	igspace										
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)											
	300 HP Dozer (2)											
	3.5 CY Front End Loader, Wheel (2)											
	16 CY 3 Axle Dump Truck (9)											
	Pickup Truck Conventional (7)											
Sheet Pile Wall	Flatbed Truck (1)											
	75 TN Crane Crawler Pile Hammer (1)											
	Pickup Truck Conventional (6)											
Culvert Head Wall	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (6)											
Precast Box Culvert 10'x8'x30'	90 TN Truck Mounted Hydraulic Crane (1)											
	Flatbed Truck (2)											
	Pickup Truck Conventional (4)											
Water Control Structure	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (6)											
Inflatable Obermeyer Gates	90 TN Truck Mounted Hydraulic Crane (1)											
	Haul Truck Oversize Transport (1)											
	Pickup Truck Conventional (4)											
19 - Buildings, Grounds, and Utilities	rickap Track Conventional (1)											
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
Thosinzation and Bomosinzation	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
	Temp. Mobile Office Building (1)											
CMU Building and Earthwork Pad	165 HP Dozer (1)											
Construction	Scraper (1)											
Construction	Motor Grader (1)											
	Compactor (1)											
	4000 Gal Water Truck (1)											
	10 TN Smooth Roller (1)											
	Pickup Truck Conventional (7)											
	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Extended Boom Pallet Loader (1)											
	Concrete Mixer Truck (1)	<b>├</b>										
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)											
	2.5" Dia. Concrete Vibrator (1)											
	Concrete Mixer Truck (2)											
	Pickup Truck Conventional (7)											
20 -Permanent Operating Equipment						,		-				
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)											
	Extended Boom Pallet Loader (1)											
	Pickup Truck Conventional (1)											
Power, Electrical, & Mechanical Equipment												
	Pickup Truck Conventional (3)											
Communication Equipment	Pickup Truck Conventional (3)											
0 1/00 00/7 1/1 0 0 1 1	Habitat Pactoration & Fish Passage Project				 	 		 	 	 		

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Constructability and Construction Considerations. March 10.

## Construction Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (A

Table L-62. Construction Vibration Level at the Receptor												Е	stima	ted Du	uratio	n, Wee	k											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	2.2	0.39	0.7	0.57	1.64	1.43	3.62	2.72	2	2.86	2.72	0.46	1.29	0.15	0.08	0.3	0.08	0.91	n/a	n/a	n/a	0.68	0.23	n/a	n/a	n/a	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
PPV at the Receptor (in/sec)	0.11	0.02	0.04	0.03	0.08	0.07	0.19	0.14	0.10	0.15	0.14	0.02	0.07	0.01	0.00	0.02	0.00	0.05	n/a	n/a	n/a	0.04	0.01	n/a	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	n/a	n/a	no	no	n/a	n/a	n/a	n/a	n/a
Human Annoyance	_																											
Total Lv @ 25'	115	100	105	103	113	111	120	117	114	117	117	102	111	92	86	98	86	108	n/a	n/a	n/a	105	96	n/a	n/a	n/a	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970	970
Distance Divergence (dBA)	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7
Lv at the Receptor (VdB)	68	53	58	56	65	64	72	69	67	70	69	54	63	44	38	50	38	60	n/a	n/a	n/a	57	48	n/a	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	n/a	n/a	no	no	n/a	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

Source: Google Earth

72 VdB

Receptors:

Nearest residential receptor (ft)

2600

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

# Construction Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-63. Construction Vibration and Ground-Borne Vibration

Table L-63. Construction Vibration a	and Ground-Borne Vibration							
Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
02 - Relocations	·							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	3	0.076	0.228	86	10	96
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Levee O&M Road Regrading (6" AB)	12' Blade Grader (1)	n/a	1	-	-	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	_	-	0	_
	16 CY 3 Axle Dump Truck (5)	Loaded Trucks	5	0.076	0.38	86	14	100
Temporary Electrical Power	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	_	_	6	_
09 - Channels and Canals	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	15	0.076	1.14	86	24	110
	Extended Boom Pallet Loader (1)	n/a	1	-	_	-	0	_
	Pickup Truck Conventional (1)	n/a	1	_	_	_	0	_
Clearing and Grubbing	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
3	Trailer Mounted Brush Chipper (1)	n/a	1 1	_	_	_	0	_
	Chainsaw (1)	n/a	1	_	_	_	0	_
	4000 Gal Water Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
	Temp. Mobile Office Building (1)	Loaded Trucks	1	0.076	0.076	86	0	86
Excavation/Grading (Dry Conditions)	300 HP Dozer (1)	large Bulldozer	1	0.089	0.089	87	0	87
Executation, Grading (Bry Genations)	21 CY Scrapers (4)	n/a	4	-	- 0.000	-	12	-
	12' Blade Grader (1)	n/a	1	_	_	_	0	_
	4000 GAL Water Truck (1)	Loaded Trucks	'1	0.076	0.076	86	0	86
	Pickup Truck Conventional (7)	n/a	7	0.070	0.070	-	17	_
Riprap - Class 2	2.5 CY Hydraulic Excavators (2)	n/a	2	-	-	_	6	-
Tripiap Olass 2	300 HP Dozer Crawler (1)	large Bulldozer	1	0.089	0.089	87	0	87
	Pickup Truck Conventional (5)	n/a	5	0.009	0.009	-	14	- 07
	16 CY 3 Axle Dump Trucks (23)	Loaded Trucks	23	0.076	1.748	86	27	113
Erosion Control Seeding	0.8 CY Front End Loader, Wheel (1)	n/a	1	-	1.740	-	0	113
Liosion Control Seeding	Pickup Truck Conventional (4)	n/a	4	_	_		12	
11 - Levees and Flood walls	Fickup Truck Conventional (4)	jil/a	4		_	-	12	
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	4	0.076	0.304	86	12	98
Mobilization and Demobilization	Extended Boom Pallet Loader (1)	n/a	4	0.076	0.304	00	0	90
	Pickup Truck Conventional (3)	n/a	3	_	_	_	10	_
Berm/ Levee Fill	300 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Beilii/ Levee Fili	4000 Gal Water Truck (1)	Loaded Trucks					0	1
	10 TN Smooth Roller (1)			0.076	0.076	86	0	86
	` '	n/a	1 2	-	-	_	•	_
45 Floodway Control and Divarsion Strue	Pickup Truck Conventional (3)	n/a	3	-		-	10	
15 - Floodway Control and Diversion Structure Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	I 0.012	0.6	22	100
INIODIIIZAUON AND DEMODIIIZAUON	Extended Boom Pallet Loader (1)		12	0.076	0.912	86	22	108
	. ,	n/a		_	-	-	U	_
Construction Cita Downtonia	Pickup Truck Conventional (1)	n/a	1 1	- 0.070	0.070	-	0	-
Construction Site Dewatering	Flatbed Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
(Temporary Cofferdam)	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1 1	0.644	0.644	104	0	104
Construction Cita Develories (Dura : )	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	<del>-</del>
Construction Site Dewatering (Pumping)	6" Dia. Pump Engine Drive (1)	n/a	1	_	· -	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	_	-	10	-

### **Construction Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)**

Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	ln/a	1		1		0	
Excavation (vvet Conditions)	300 HP Dozer (2)			0.089	0.178	- 87	6	93
		Large Bulldozer	2	0.089	0.178	0/	-	93
	3.5 CY Front End Loader, Wheel (2)	n/a	2	- 0.70	- 0.004	-	6	-
	16 CY 3 Axle Dump Truck (9)	Loaded Trucks	9 7	0.076	0.684	86	19	105
OL4 Dil - M - II	Pickup Truck Conventional (7)	n/a Loaded Trucks		- 0.070	- 0.070	-	17	-
Sheet Pile Wall	Flatbed Truck (1)		1	0.076	0.076	86	0	86
	75 TN Crane Crawler Pile Hammer (1)	Pile Driver (impact)	1	0.644	0.644	104	0	104
la	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Culvert Head Wall	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Precast Box Culvert 10'x8'x30'	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Flatbed Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-
Water Control Structure	2.5" Dia. Concrete Vibrator (1)	n/a	1	-	-	-	0	-
	Concrete Mixer Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (6)	n/a	6	-	-	-	16	-
Inflatable Obermeyer Gates	90 TN Truck Mounted Hydraulic Crane (1)	n/a	1	-	-	-	0	-
	Haul Truck Oversize Transport (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (4)	n/a	4	-	-	-	12	-
19 - Buildings, Grounds, and Utilities		•						
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	10	0.076	0.76	86	20	106
	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
CMU Building and Earthwork Pad	165 HP Dozer (1)	Large Bulldozer	1	0.089	0.089	87	0	87
Construction	Scraper (1)	n/a	1	-	-	-	0	-
	Motor Grader (1)	n/a	1	-	-	-	0	-
	Compactor (1)	n/a	1	-	_	-	0	-
	4000 Gal Water Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
	10 TN Smooth Roller (1)	n/a	1 1	-	-	-	0	-
	Pickup Truck Conventional (7)	n/a	7	_	_	_	17	_
	Concrete Pump Boom Truck Mounted (1)	n/a	1 1	_	_	_	0	_
	2.5" Dia. Concrete Vibrator (1)	n/a	1 1	_	_	_	0	_
	Extended Boom Pallet Loader (1)	n/a	1 1	_	_	_	0	_
	Concrete Mixer Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	n/a	1	- 0.070	0.070	-	0	
Concrete Duct Bank	2.5" Dia. Concrete Vibrator (1)	n/a		_	_	_	0	
	` '	Loaded Trucks	1	0.070	0.450	-	_	- 00
	Concrete Mixer Truck (2)		2	0.076	0.152	86	6	92
20 Dermonant Operation Facilities	Pickup Truck Conventional (7)	n/a	7	-		-	17	<u> </u>
20 -Permanent Operating Equipment	Dieth ad Truck (4 man size a stransism st	Leaded Tweeter		0.070	0.000	00	40	00
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)	Loaded Trucks	3	0.076	0.228	86	10	96
	Extended Boom Pallet Loader (1)	n/a	1 1	-	-	-	0	· -
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Power, Electrical, & Mechanical Equipment	Extended Boom Pallet Loader (1)	n/a	1	-	-	-	0	-
	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-
Communication Equipment	Pickup Truck Conventional (3)	n/a	3	-	-	-	10	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

# Construction Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-64. Construction Vibration Level at the Receptor

<b>Building Damage</b>	
	Total PPV @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
<b>Human Annoyance</b>	
	Total Lv @ 25'
	Distance from the Center of Construction Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

800

Receptors:

Nearest residential receptor (ft)

# Construction Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

202 - Redictorions  Webbrighted and Michael Brusk (1 per piece of equipment) Excended Regarding (6* Ab) Extended Regarding (6* Ab) ADD Self Michael Truck (1) ADD Get Michael Truck (1) ADD Get Michael Truck (1) ADD Get Michael Truck (1) ADD Get Michael Truck (1) ADD Get Michael Truck (1) ADD Get Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Truck (1) ADD Self Michael Self Michael Self Michael Truck (1) ADD Self Michael	Table L-63. Construction Vibration	and Ground-Borne Vibration												-	Estima	ated D	uratio	n, We	ek											
Particle Truck (1 per peace of dyspigment)																														
Particle Truck (1 per peace of dyspigment)	Phase	Equipment Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Extended Boom Palet Loader (1)  Levee G&M Road Regrading (6" AD)  17 2 Blass Ginster (1)  18 CV 2 As to Dump Trusk (6)  18 CV 3 As to Dump Trusk (6)  18 CV 3 As to Dump Trusk (6)  18 CV 3 As to Dump Trusk (7)  19 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter	02 - Relocations							<u> </u>					<u> </u>	•			•	<u>.                                      </u>	•	<u>.                                      </u>	<u> </u>	<u> </u>	<u>.                                      </u>	<u>.                                      </u>	•					
Extended Boom Palet Loader (1)  Levee G&M Road Regrading (6" AD)  17 2 Blass Ginster (1)  18 CV 2 As to Dump Trusk (6)  18 CV 3 As to Dump Trusk (6)  18 CV 3 As to Dump Trusk (6)  18 CV 3 As to Dump Trusk (7)  19 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracte  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter  10 Constraints and Caracter	Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)																												
12 Blade Grader (1)   12 Blade Grader (1)   12 Blade Grader (1)   13 Blade Grader (1)   14 Blade Grader (1)   15 Blader Grader (1)   15 Blader Grader (1)		Extended Boom Pallet Loader (1)																												Ì
4000 Gill Water Truck (1) Plockp Truck Conventional (1) 16 CV 3 Aire Dump Truck (5) 17 Emporary Electrical Power Packed Truck (1) Plockp Truck Conventional (2) 18 - Channels and Canals Mobilization and Demobilization Plockp Truck Conventional (2) Plockp Truck Conventional (1) Plockp Truck Conventional (2) Plockp Truck Conventional (3) Plock Truck Conventional (3) Plock Truck Conventional (3) Plockp Truck Conventional (3) Plockp Truck Conventional (3) Plockp Truck Conventional (3) Plockp Truck Conventional (3) Plockp Truck Conventional (3) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (4) Plockp Truck Conventional (5) Plockp Truck Conventional (6) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) Plockp Truck Conventional (7) P	Levee O&M Road Regrading (6" AB)	1 7																												
Pickup Truck Conventional (1)  Flore Channels and Carlo  Flatbed Truck (1)  Flatbed Truck (1)  Flatbed Truck (1)  Flatbed Truck (1)  Flatbed Truck (1)  Flore Pickup Truck Conventional (2)  Flore Channels and Carlo  Flore Channels and Carlo  Flore Channels and Carlo  Flore Channels and Carlo  Flore Channels and Carlo  Flore Channels Conventional (1)  Clearing and Grubbing  Tisc VF From End Loader Channel (1)  Trailer Mounted Brush Chapper (1)  Channes (1)  House Truck Conventional (8)  Excavation/Grading (Dry Conditions)  Solic Process (4)  12 Black Grader (1)  Flore Conventional (8)  Flore Channels Steeling  Flore Channels Steeling  Flore Channels Steeling  On Or Y And Processors (2)  300 FP Dobies Channel (1)  Flore Truck Channels (1)  Flore Truck Channels (1)  Flore Truck Channels (1)  Flore Truck Channels Steeling  On Or Y And Promotocol (1)  Flore Truck Channels Steeling  On Or Y And Promotocol (1)  Flore Truck Channels Steeling  On Or Y And Promotocol (1)  Flore Truck Channels Steeling  On Or Y And Promotocol (1)  Flore Truck Channels Steeling  On Or Y And Promotocol (1)  Flore Truck Channels Steeling  Flore Truck (1)  Flore Truck Channels Steeling  Flore Truck (1)  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore On Truck Channels Steeling  Flore On Truck Channels Steeling  Flore On Truck Channels Steeling  Flore Truck Channels Steeling  Flore On Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore Truck Channels Steeling  Flore T	Lavor cam rioda riograding (c 7.2)	• • • • • • • • • • • • • • • • • • •																												l
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Temporary Electrical Power   Flatible Thuck (1)																														l
Pickup Truck Conventional (2)   Pickup Truck Conventional (2)	Temporary Electrical Power														+							1	+							
Mobilization and Demobilization   Flatbed Truck (1 per piece of equipment)   Extended Boom Pallet Loader (1)   Extended Boom Pallet Loader (	Tomporary Electrical Fewer																													l
Mobilization and Demobilization Fished Truck (1 per piece of equipment) Estended Soon Palet Loader (1) Fished, Truck Conventional (1) Clearing and Grubbing I. 5.C YF Front End Loader Crawler (1) Trailer Mounted Brush Chipper (1) Chainsaw (1) 4000 Sal Water Truck (1) Prickup Truck Conventional (6) Tomp. Mobilis Office Sulding (1) 21 Cr Strappes (4) 22 Cr Strappes (4) 4000 Sal Water Truck (1) Prickup Truck Conventional (7) Prickup Truck Conventional (7) Prickup Truck Conventional (7) Excavation/Grading (Dry Conditions) Silve Proceed Crawler (1) Prickup Truck Conventional (7) Prickup Truck Conventional (7) Son Prickup Truck Conventional (7) Son Prickup Truck Conventional (7) Prickup Truck Conventional (8) Tompore Crawler (1) Prickup Truck Conventional (9) Son Sy Front Field Loader (1) Prickup Truck Conventional (9) Son Sy Front Field Loader (1) Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck Conventional (9) Son Prickup Truck (1) Son Pr	09 - Channels and Canals	Tionap Track Conventional (2)																												
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	Constitution one Dewatering (Fullpling)	Pickup Truck Conventional (3)																												İ

## Construction Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

			 		 _			 					 
Excavation (Wet Conditions)	4.5 CY Hydraulic Excavator (1)	i											
	300 HP Dozer (2)	i											
	3.5 CY Front End Loader, Wheel (2)	i											
	16 CY 3 Axle Dump Truck (9)	i											
	Pickup Truck Conventional (7)	i											
Sheet Pile Wall	Flatbed Truck (1)												
	75 TN Crane Crawler Pile Hammer (1)	i											
	Pickup Truck Conventional (6)	i											
Culvert Head Wall	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)	i											
	Pickup Truck Conventional (6)	i											
Precast Box Culvert 10'x8'x30'	90 TN Truck Mounted Hydraulic Crane (1)	-											
	Flatbed Truck (2)	i											
	Pickup Truck Conventional (4)	i											
Water Control Structure	2.5" Dia. Concrete Vibrator (1)												
	Concrete Mixer Truck (2)	.											
	Pickup Truck Conventional (6)	i											
Inflatable Obermeyer Gates	90 TN Truck Mounted Hydraulic Crane (1)	-+	+		+								+++
initiation obeimeyer dates	Haul Truck Oversize Transport (1)	i											
	Pickup Truck Conventional (4)	i											
19 - Buildings, Grounds, and Utilities	Tickup Truck Conventional (4)												
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)		<del></del>						T			T	$\overline{}$
Woodingation and Demodifization	Extended Boom Pallet Loader (1)												
	Pickup Truck Conventional (1)												
ONALL Decilities are at Freetheads Decil							-						
CMU Building and Earthwork Pad	165 HP Dozer (1)												
Construction	Scraper (1)	ı II											
	Motor Grader (1)	ı II											
	Compactor (1)												
	4000 Gal Water Truck (1)												
	10 TN Smooth Roller (1)												
	Pickup Truck Conventional (7)												
	Concrete Pump Boom Truck Mounted (1)												
	2.5" Dia. Concrete Vibrator (1)												
	Extended Boom Pallet Loader (1)												
	Concrete Mixer Truck (1)												
Concrete Duct Bank	Concrete Pump Boom Truck Mounted (1)	i l											
	2.5" Dia. Concrete Vibrator (1)	i											
	Concrete Mixer Truck (2)	i											
	Pickup Truck Conventional (7)	i											
20 -Permanent Operating Equipment									,	,			
Mobilization and Demobilization	Flatbed Truck (1 per piece of equipment)												
	Extended Boom Pallet Loader (1)	.											
	Pickup Truck Conventional (1)	.											
Power, Electrical, & Mechanical Equipment		-											
	Pickup Truck Conventional (3)	.											
Communication Equipment	Pickup Truck Conventional (3)	-+		+ +									<del>-   -  </del>
	Habitat Restoration & Fish Passage Project							1					

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Considerations. March 10.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Constructability and Construction

## Construction Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

Table L-64. Construction Vibration Level at the Receptor												E	stimat	ed Du	uratio	n, Wee	ek											
Building Damage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total PPV @ 25'	2.2	0.39	0.7	0.56	1.64	1.43	3.79	2.89	2.17	2.86	2.72	2.15	2.15	2.15	2.08	2.31	2.08	2.91	2	0.3	1.14	0.68	0.23	n/a	n/a	n/a	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
PPV at the Receptor (in/sec)	0.11	0.02	0.04	0.03	0.08	0.07	0.20	0.15	0.11	0.15	0.14	0.11	0.11	0.11	0.11	0.12	0.11	0.15	0.10	0.02	0.06	0.04	0.01	n/a	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	n/a	n/a	n/a	n/a	n/a
Human Annoyance	_																											
Total Lv @ 25'													115								110	105		n/a		n/a	n/a	n/a
Distance from the Center of Construction Activity to a Receptor (ft)	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
Distance Divergence (dBA)	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2
Lv at the Receptor (VdB)	70	55	60	58	67	66	75	72	70	72	72	70	70	70	70	70	70	72	69	53	64	60	50	n/a	n/a	n/a	n/a	n/a
Impact to Receptor	no	no	no	no	no	no	YES	YES	no	YES	no	no	no	no	no	no	no	YES	no	no	no	no	no	n/a	n/a	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

800

Receptors:

Nearest residential receptor (ft)

Table L-65. Vibration Source Levels for Construction Equipment

	PPV at 25 ft	Approximate
Equipment	(in/sec)	Lv <sup>†</sup> at 25 ft
Pile Driver (impact)	0.644	104
Pile Driver (sonic)	0.17	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall) - in soil	0.008	66
Hydromill (slurry wall) - in rock	0.017	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Federal Transit Administration. 2006. Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. May.

Values for pile drivers are based on the typical vibration source levels.

† RMS velocity in decibels (VdB) re 1 micro-inch/second

Table L-1. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Г		,		I	I		Add to Single	Total
			Usage	Equipment	Equipment	Number of	Source Level	Leq(h) @
Phase	Equipment Description	RCNM Equipment Types		Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
O&M Road	The second secon	The state of the s			1,7,0		(3)	
O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel and Intake Shelf			<u> </u>					
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74

Appendix L Noise and Vibration Calculations

### Operational Noise - Equipment Alternative 1 - East Alignment

Headworks Structure Operating Equipment								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

February 14.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-2. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Residential Uses
Agricultural Receptor	

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

\*Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Normally Acceptable 60 Conditionally Acceptable 70

Agricultural

Residential

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

**Background Noise** (dBA)

Daytime 55 Fremont Weir 60-65 dBA

Nighttime 45

Nearest residential receptor (ft)

7500

Table L-1. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table L-1. o-nour Operation & Maint	enance Noise Level at 50 Feet (dBA)	1	Т									1				LINA
			١	&M												HW Op
Dhace	Equipment Description	T-4			N/1-:	. Oh			alea Ci	16				D4	Dida	
Phase O&M Road	Equipment Description	Tot	RO	pau	IVIa	in Cha	annei a	and Int	ake 5	neir		не	adworks	Structure	Bldg	Eq
	1401 Die de Oredon (4)				-					T						
O&M Road Regrading	12' Blade Grader (1)															
Main Channel and Intake Shelf							ı	ı		T						
Debris Removal	1.5 CY Front End Loader Crawler (1)															
	16 CY 3 Axle Dump Truck (1)															
	Pickup Truck Conventional (1)															
Vegetation Removal	56 HP Tractor Rotary Mower (1)															
	16 CY 3 Axle Dump Truck (1)															
	Pickup Truck Conventional (1)															
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)															
	16 CY 3 Axle Dump Truck (3)															
	Pickup Truck Conventional (2)															
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)															
	16 CY 3 Axle Dump Truck (2)															
	Pickup Truck Conventional (1)															
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)															
	16 CY 3 Axle Dump Truck (2)															
	Pickup Truck Conventional (1)															
Channel Repairs	0.75 CY Hydraulic Excavator (1)															
	16 CY 3 Axle Dump Truck (3)															
	Pickup Truck Conventional (2)															
Channel Inspection	Pickup Truck Conventional (1)															
Headworks Structure												<u> </u>				
Debris Removal	1.5 CY Front End Loader Crawler (1)															
	16 CY 3 Axle Dump Truck (1)															
	Pickup Truck Conventional (1)															
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)															
	16 CY 3 Axle Dump Truck (3)															
	Pickup Truck Conventional (2)															
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)															
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)															
Buildings											•					
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)															
	Pickup Truck Conventional (2)															1

Headworks Structure Operating Equipment							
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)						
Test Operate Gates	Pickup Truck Conventional (1)						

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

Table L-2. 8-Hour Operation & Maintenance Noise Level at the Receptor (df

Table 2 2. 6 Treat Operation a maintenance Noice 2016 at the Neceptor (		1	1								1					$\overline{}$	
																	HW
		O&M															Op
	Tot	Road		Ma	in Cha	annel a	and Int	ake Sh	elf		Н	leadwo	orks St	tructur	е	Bldg	Eq
Total O&M Leq(h) @ 5	0' 90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76	76
Residential Receptor																	
Distance from the Center of O&M Activity to a Receptor (	t) 330	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Distance Divergence (dB/	16.4	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Atmospheric Attenuation (dB/	0.27	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
1-Hour O&M Noise Level at the Receptor (dB/	73	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62	62
CNEL (O&M Noise + Existing) (dBA	70	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60	60
Impact to Residential Use	s CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA	CA
Agricultural Receptor																	
Distance from the Center of O&M Activity to a Receptor (	t) 110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Distance Divergence (dB/	6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Atmospheric Attenuation (dB	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1-Hour O&M Noise Level at the Receptor (dB/	() 83	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72	72
CNEL (O&M Noise + Existing) (dBA	() 79	73	80	70	73	73	70	70	73	64	76	70	73	66	66	68	68
Impact to Agricultural Use	s CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential Background Noise

Daytime 55 Nighttime 45

Nearest residential receptor (ft)

7500

(dBA)

Table L-3. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

							Add to Single	Total
			Usage	Equipment	Equipment	Number of	Source Level	Leq(h) @
Phase	<b>Equipment Description</b>	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
O&M Road	•		-					•
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel and Intake Shelf								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
Charmer Repairs	1					, '		
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
-	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Headworks Structure Operating Equipmen	t							
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

February 14.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-4. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Residential Uses

**Agricultural Receptor** 

Distance from the Center of O&M Activity to a Receptor (ft) Distance Divergence (dBA) Atmospheric Attenuation (dBA) 1-Hour O&M Noise Level at the Receptor (dBA) CNEL (O&M Noise + Existing) (dBA) Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60 Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

**Background Noise** (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft) 4200

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-3. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table E-3: 0-110di Operation a mai	THEHAITCE NOISE LEVEL AT 50 FEET (UDA)		1											1	T
			001												HW
Phase	Equipment Description	Tot	O&N Road		NA:	ain Ch	annel a	nd Int	aka Si	half		u <sub>n</sub>	eadworks Structure	Bldg	Op Eq
O&M Road	Equipment Description	100	Noa	4	IVI	aiii Cii	ailleia	ina mi	are Si	IEII		пе	auworks Structure	Diag	<u>                                     </u>
	1000 1 0 1 (4)					1		ı		ı	T			<del>                                      </del>	T
Levee O&M Road Regrading	12' Blade Grader (1)														
Main Channel and Intake Shelf															
Debris Removal	1.5 CY Front End Loader Crawler (1)														
	16 CY 3 Axle Dump Truck (1)														
	Pickup Truck Conventional (1)														
Vegetation Removal	56 HP Tractor Rotary Mower (1)														
	16 CY 3 Axle Dump Truck (1)														
	Pickup Truck Conventional (1)														
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)														
	16 CY 3 Axle Dump Truck (3)														
	Pickup Truck Conventional (2)														
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)														
	16 CY 3 Axle Dump Truck (2)														
	Pickup Truck Conventional (1)														
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)														
	16 CY 3 Axle Dump Truck (2)														
	Pickup Truck Conventional (1)														

Channel Repairs	0.75 CY Hydraulic Excavator (1)						
	, ,						
	16 CY 3 Axle Dump Truck (3)						I
	Pickup Truck Conventional (2)						
Channel Inspection	Pickup Truck Conventional (1)						
Headworks Structure							
Debris Removal	1.5 CY Front End Loader Crawler (1)						
	16 CY 3 Axle Dump Truck (1)						
	Pickup Truck Conventional (1)						
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)						
	16 CY 3 Axle Dump Truck (3)						
	Pickup Truck Conventional (2)						
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)						
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)						
Buildings							
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)						l
	Pickup Truck Conventional (2)						l
Headworks Structure Operating Equipment	1			•			
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)						
Test Operate Gates	Pickup Truck Conventional (1)						
	-	 					

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance. February 14.

Table L-4. 8-Hour Operation & Maintenance Noise Level at the Receptor (dl

Table 2 47 6 from operation a maintenance from 20 for at the frompt	(		T									Г						
																	1 !	HW
			O&M														1	Ор
		Tot	Road	d Main Channel and Intake Shelf Headworks Structure												re	Bldg	Eq
Total O&M Leq(h)	@ 50'	90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76	76
Residential Receptor																		
Distance from the Center of O&M Activity to a Recep	tor (ft)	330	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	25
Distance Divergence	(dBA)	16.4	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.
Atmospheric Attenuation	(dBA)	0.27	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.2
1-Hour O&M Noise Level at the Receptor	(dBA)	73	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62	62
CNEL (O&M Noise + Existing)	(dBA)	70	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60	60
Impact to Residential	l Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA	CA
	-																	
Agricultural Receptor																		
Distance from the Center of O&M Activity to a Recep	tor (ft)	110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	8
Distance Divergence	(dBA)	6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Atmospheric Attenuation	(dBA)	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.0
1-Hour O&M Noise Level at the Receptor	(dBA)	83	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72	72
CNEL (O&M Noise + Existing)	(dBA)	79	73	80	70	73	73	70	70	73	64	76	70	73	66	66	68	68
Impact to Agricultural	l Uses	CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft)

4200

Table L-5. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

	Equipment Description	RCNM Equipment Types			Equipment Lea(h) @ 50'	Number of Equipment	Source Level	Leq(h) @ 50'
D&M Road	The second second	4.1			1( )	1 1	(3)	
Main Channel and Intake Shelf								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
/egetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
		Dump Truck	40%	76	72	1	0	72
		Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
,	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	• • • • •	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)		Crane	16%		73	1	0	73
. , ,	16 CY 3 Axle Dump Truck (2)		40%	76		2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	. ,	·	16%	81	73	1	0	73
, , , ,	` '	Dump Truck	40%	76	72	2	3	75
	• • • •							
Channel Repairs	. ,	•	40%			1	0	
·	•	Dump Truck	40%	76		3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	. ,	·						
		· ·						
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
,	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	• • • •		40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Buildings	. ,							
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Headworks Structure Operating Equipmen	nt							
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

February 14.

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-6. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Residential Uses
<u> </u>	

Agricultural Receptor

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

(dBA)

Significance Level

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Source: Google Earth

Normal Suburban Residential Land Use Type

**Background Noise** (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft)

700

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-5. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table L-5. 8-Hour Operation & Mail	ntenance Noise Level at 50 Feet (dBA)		T .	Τ			1							HW
			O&M											Оp
Phase	Equipment Description	Tot	Road	Main Channel and Inta	ke Sl	nelf		Н	eadwo	orks St	tructui	re	Bldg	Eq
O&M Road														
Levee O&M Road Regrading	12' Blade Grader (1)													
Main Channel and Intake Shelf	<u> </u>													
Debris Removal	1.5 CY Front End Loader Crawler (1)													
	16 CY 3 Axle Dump Truck (1)													
	Pickup Truck Conventional (1)													
Vegetation Removal	56 HP Tractor Rotary Mower (1)													
	16 CY 3 Axle Dump Truck (1)													
	Pickup Truck Conventional (1)													
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)													
	16 CY 3 Axle Dump Truck (3)													
	Pickup Truck Conventional (2)													
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)													
	16 CY 3 Axle Dump Truck (2)													
	Pickup Truck Conventional (1)													
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)													
	16 CY 3 Axle Dump Truck (2)													
	Pickup Truck Conventional (1)													
Channel Repairs	0.75 CY Hydraulic Excavator (1)													
	16 CY 3 Axle Dump Truck (3)													
	Pickup Truck Conventional (2)													
Channel Inspection	Pickup Truck Conventional (1)													
Headworks Structure														
Debris Removal	1.5 CY Front End Loader Crawler (1)													
	16 CY 3 Axle Dump Truck (1)													
	Pickup Truck Conventional (1)													
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)													
	16 CY 3 Axle Dump Truck (3)													
	Pickup Truck Conventional (2)													
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)													
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)													
Buildings														
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)													
-	Pickup Truck Conventional (2)													
Headworks Structure Operating Equipme														
Mechanical Hydraulic Equipment Upkeep														
Test Operate Gates	Pickup Truck Conventional (1)													

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

February 14.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-6. 8-Hour Operation & Maintenance Noise Level at the Receptor (df

·	,																HW
		O&M															Ор
	Tot	Road		Ma	in Cha	nnel a	and Int	ake Sh	nelf		Н	leadwo	orks S	tructur	e	Bldg	Eq
Total O&M Leq(h) @ 5	0' 90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76	76
Residential Receptor																	
Distance from the Center of O&M Activity to a Receptor (	ft) 330	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Distance Divergence (dB	A) 16.4	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Atmospheric Attenuation (dB	A) 0.27	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
1-Hour O&M Noise Level at the Receptor (dB	A) 73	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62	62
CNEL (O&M Noise + Existing) (dB	A) 70	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60	60
Impact to Residential Us	es CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA	CA
Agricultural Receptor																	
Distance from the Center of O&M Activity to a Receptor (	ft) 110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Distance Divergence (dB	A) 6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Atmospheric Attenuation (dB	A) 0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1-Hour O&M Noise Level at the Receptor (dB	,	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72	72
CNEL (O&M Noise + Existing) (dB	A) 79	73	80	70	73	73	70	70	73	64	76	70	73	66	66	68	68
Impact to Agricultural Us	es CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

Table L-7. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

						Nicomole en -f	Add to Single	Total
Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Source Level (dBA)	Leq(h) @ 50'
O&M Road	Equipment Description	RCNW Equipment Types	ractor	Liliax @ 30	Leq(ii) @ 30	Equipment	(UDA)	30
	401 DI- d- Od (4)	lo d	400/	0.5	0.4	T 4	0	0.4
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel and Intake Shelf								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Headworks Structure Operating Equipmen	t							
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

February 14.

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-8. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Residential Uses
_	

**Agricultural Receptor** 

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft)

700

(dBA)

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-7. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table L-7. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)											
			001						HW		
DI	E. t B t. tt		O&M			l			Op		
Phase	Equipment Description	lot	Road	Main Channel and Intake Shelf		Heady	vorks Structure	Bldg	Eq		
O&M Road											
Levee O&M Road Regrading	12' Blade Grader (1)										
Main Channel and Intake Shelf											
Debris Removal	1.5 CY Front End Loader Crawler (1)										
	16 CY 3 Axle Dump Truck (1)										
	Pickup Truck Conventional (1)										
Vegetation Removal	56 HP Tractor Rotary Mower (1)										
	16 CY 3 Axle Dump Truck (1)										
	Pickup Truck Conventional (1)										
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)										
	16 CY 3 Axle Dump Truck (3)										
	Pickup Truck Conventional (2)										
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)										
	16 CY 3 Axle Dump Truck (2)										
	Pickup Truck Conventional (1)										
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)										
	16 CY 3 Axle Dump Truck (2)										
	Pickup Truck Conventional (1)										

Channel Repairs	0.75 CY Hydraulic Excavator (1)								
·	16 CY 3 Axle Dump Truck (3)								
	Pickup Truck Conventional (2)								
Channel Inspection	Pickup Truck Conventional (1)								
Headworks Structure									
Debris Removal	1.5 CY Front End Loader Crawler (1)								
	16 CY 3 Axle Dump Truck (1)								
	Pickup Truck Conventional (1)								
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)								
	16 CY 3 Axle Dump Truck (3)								
	Pickup Truck Conventional (2)								
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)								
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)								
Buildings								<u> </u>	
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)								
	Pickup Truck Conventional (2)								
Headworks Structure Operating Equipmen	t								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)								
Test Operate Gates	Pickup Truck Conventional (1)								

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-8. 8-Hour Operation & Maintenance Noise Level at the Receptor (df

	` <u> </u>	O&M													Ī	HW	
		O&M														1	Op
	Tot	Road		Ма	in Cha	nnel a	and Int	ake Sh	nelf		Н	leadwo	orks S	tructur	e	Bldg	Eq
Total O&M Leq(h) @ 9	0' 90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76	76
Residential Receptor																	
Distance from the Center of O&M Activity to a Receptor	ft) 700	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Distance Divergence (dB	A) 22.9	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Atmospheric Attenuation (dB	A) 0.58	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
1-Hour O&M Noise Level at the Receptor (dB	A) 67	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62	62
CNEL (O&M Noise + Existing) (dB	A) 64	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60	60
Impact to Residential Us	es CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA	CA
Agricultural Receptor																	
Distance from the Center of O&M Activity to a Receptor	,	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Distance Divergence (dB		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Atmospheric Attenuation (dB	A) 0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1-Hour O&M Noise Level at the Receptor (dB	,	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72	72
CNEL (O&M Noise + Existing) (dB		73	80	70	73	73	70	70	73	64	76	70	73	66	66	68	68
Impact to Agricultural Us	es CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

Table L-9. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

	TREMANDE NOISE LEVEL AT 30 1 EET (UDA	,					Add to Single	Total
<b>D</b>	E. C. C. A. B. C. C. Mar.	DOWN 5	Usage		Equipment	Number of	Source Level	Leq(h) @
Phase O&M Road	Equipment Description	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel and Intake Shelf	12 Blade Grader (1)	Grader	40%	65	01	<u> </u>	U	01
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1 1	0	75
Debris Removal	* *			79 76	75 72	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%			•		
V	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Headworks Structure	•							
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
,	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection		Pickup Truck	40%	75	71	2	3	74
Buildings	[	[	1.575					
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Headworks Structure Operating Equipme		I total	1070	, , ,	, , , , , , , , , , , , , , , , , , ,			· · ·
Mechanical Hydraulic Equipment Upkeep		Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Tool Operate Gales	1 lokap Track Conventional (1)	1 lokup Truok	7070	, ,	/ '	_ '	Ŭ	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-10. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Residential Uses

Agricultural Receptor

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

\*Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

(dBA)

Significance Level

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft)

3800

Table L-9. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table L-9. 8-Hour Operation & Mair	ntenance Noise Level at 50 Feet (dBA)		П										HW
			О&М										Ор
Phase	Equipment Description	Tot	Road	Main Channel and Int	ake S	helf	Не	eadwo	orks St	ructur	e	Bldg	Eq
O&M Road	<u> </u>		<del></del>										
Levee O&M Road Regrading	12' Blade Grader (1)												
Main Channel and Intake Shelf	.,												
Debris Removal	1.5 CY Front End Loader Crawler (1)												
	16 CY 3 Axle Dump Truck (1)												1
	Pickup Truck Conventional (1)												'n
Vegetation Removal	56 HP Tractor Rotary Mower (1)												
	16 CY 3 Axle Dump Truck (1)												'n
	Pickup Truck Conventional (1)												1
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)												
	16 CY 3 Axle Dump Truck (3)												'n
	Pickup Truck Conventional (2)												i
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)												
, , , , ,	16 CY 3 Axle Dump Truck (2)												'n
	Pickup Truck Conventional (1)												i,
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)												
	16 CY 3 Axle Dump Truck (2)												i
	Pickup Truck Conventional (1)												ì
Channel Repairs	0.75 CY Hydraulic Excavator (1)												
	16 CY 3 Axle Dump Truck (3)												i
	Pickup Truck Conventional (2)												i
Channel Inspection	Pickup Truck Conventional (1)												
Headworks Structure													
Debris Removal	1.5 CY Front End Loader Crawler (1)												
	16 CY 3 Axle Dump Truck (1)												in the second
	Pickup Truck Conventional (1)												'n
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)												
	16 CY 3 Axle Dump Truck (3)												'n
	Pickup Truck Conventional (2)												i,
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)												
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)												
Buildings													
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)												
	Pickup Truck Conventional (2)												
Headworks Structure Operating Equipme	nt												
Mechanical Hydraulic Equipment Upkeep													
Test Operate Gates	Pickup Truck Conventional (1)												

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-10. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

Table 2 1010 floar operation a maintenance flores 2010 at the floopter	`	1	T .														HW
		OOM	O&M														
											l .					DI-1	Op
	Tot	Road		. Ma	ain Cha	annel a	and Int	ake Sr	nelt		Н	leadwo	orks S	tructui	e	Bldg	Eq
Total O&M Leq(h) @ 5	0' 90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76	76
Residential Receptor																	
Distance from the Center of O&M Activity to a Receptor (	t) 330	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Distance Divergence (dB.	16.4	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Atmospheric Attenuation (dB.	(4) 0.27	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
1-Hour O&M Noise Level at the Receptor (dB	(4) 73	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62	62
CNEL (O&M Noise + Existing) (dB	A) 70	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60	60
Impact to Residential Use	s CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA	CA
Agricultural Receptor																	
Distance from the Center of O&M Activity to a Receptor (	t) 110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Distance Divergence (dB.	4) 6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Atmospheric Attenuation (dB.	A) 0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1-Hour O&M Noise Level at the Receptor (dB.	A) 83	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72	72
CNEL (O&M Noise + Existing) (dB.	A) 79	73	80	70	73	73	70	70	73	64	76	70	73	66	66	68	68
Impact to Agricultural Use	s CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft)

3800

Table L-11. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

			Usage	Equipment	Equipment	Number of	Add to Single Source Level	Total Leq(h) @
Phase	Equipment Description	RCNM Equipment Types	Factor		Leq(h) @ 50'	Equipment		50'
O&M Road								
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel and Intake Shelf		<u> </u>						•
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Headworks Structure Operating Equipmen	t							
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-12. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Residential Uses

**Agricultural Receptor** 

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

(dBA)

Significance Level

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft)

700

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-11. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table L-11. 6-Hour Operation & Wia	amilenance noise Level at 50 Feet (uba	<u>')</u>			_			
			00 M					HW
Phase	Equipment Description	Tot	O&M Road	Shelf	Hea	adworks Structure	Bldg	Op Eq
O&M Road		<u> </u>						
Levee O&M Road Regrading	12' Blade Grader (1)						T	
Main Channel and Intake Shelf					'			
Debris Removal	1.5 CY Front End Loader Crawler (1)							
	16 CY 3 Axle Dump Truck (1)							
	Pickup Truck Conventional (1)							
Vegetation Removal	56 HP Tractor Rotary Mower (1)							
	16 CY 3 Axle Dump Truck (1)							
	Pickup Truck Conventional (1)							
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)							
	16 CY 3 Axle Dump Truck (3)							
	Pickup Truck Conventional (2)							
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)							
	16 CY 3 Axle Dump Truck (2)							
	Pickup Truck Conventional (1)							
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)							
	16 CY 3 Axle Dump Truck (2)							
	Pickup Truck Conventional (1)							

Channel Repairs	0.75 CY Hydraulic Excavator (1)							
	16 CY 3 Axle Dump Truck (3)							
	Pickup Truck Conventional (2)							
Channel Inspection	Pickup Truck Conventional (1)							
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)							
	16 CY 3 Axle Dump Truck (1)							
	Pickup Truck Conventional (1)							
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)							
	16 CY 3 Axle Dump Truck (3)							
	Pickup Truck Conventional (2)							
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)							
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)							
Buildings						 <u> </u>		
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)							
-	Pickup Truck Conventional (2)							
Headworks Structure Operating Equipmen	t			•	•	•		
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)							
Test Operate Gates	Pickup Truck Conventional (1)							

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-12. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

	O&M															HW
	O&M															Op
Tot	Road		Ма	in Cha	annel a	and Int	ake Sh	elf		Н	leadwo	orks St	tructur	e	Bldg	Eq
90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76	76
330	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
16.4	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
0.27	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
73	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62	62
70	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60	60
CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA	CA
110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
83	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72	72
79	73	80	70	73	73	70	70	73	64	76	70	73	66	66	68	68
CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA
	Tot 90  330 16.4 0.27 73 70 CA  110 6.8 0.09 83 79	70t Road 90 81  330 250 16.4 14.0 0.27 0.21 73 67 70 64 CA CA  110 80 6.8 4.1 0.09 0.07 83 77 79 73	O&M Road         S           90         81         88           330         250         250           16.4         14.0         14.0           0.27         0.21         0.21           73         67         73           70         64         70           CA         CA         CA           110         80         80           6.8         4.1         4.1           0.09         0.07         0.07           83         77         83           79         73         80	O&M           Tot         Road         Ma           90         81         88         78           330         250         250         250           16.4         14.0         14.0         14.0           0.27         0.21         0.21         0.21           73         67         73         64           70         64         70         61           CA         CA         CA           110         80         80         80           6.8         4.1         4.1         4.1           0.09         0.07         0.07         0.07           83         77         83         74           79         73         80         70	O&M           Tot         Road         Main Cha           90         81         88         78         81           330         250         250         250         250           16.4         14.0         14.0         14.0         14.0           0.27         0.21         0.21         0.21         0.21           73         67         73         64         67           70         64         70         61         64           CA         CA         CA         CA           110         80         80         80         80           6.8         4.1         4.1         4.1         4.1           0.09         0.07         0.07         0.07         0.07           83         77         83         74         77           79         73         80         70         73	O&M           Tot         Road         Main Channel a           90         81         88         78         81         81           330         250         250         250         250         250         250           16.4         14.0         14.0         14.0         14.0         14.0         14.0           0.27         0.21         0.21         0.21         0.21         0.21         0.21           73         67         73         64         67         67           70         64         70         61         64         64           CA         CA         CA         CA         CA           110         80         80         80         80         80           6.8         4.1         4.1         4.1         4.1         4.1           0.09         0.07         0.07         0.07         0.07         0.07           83         77         83         74         77         77           79         73         80         70         73         73	O&M           Tot         Road         Main Channel and Int           90         81         88         78         81         81         78           330         250	O&M           Tot         Road         Main Channel and Intake Sh           90         81         88         78         81         81         78         78           330         250 <td>O&amp;M           Main Channel and Intake Shelf           90         81         88         78         81         81         78         78         81           330         250</td> <td>O&amp;M           Tot Road         Main Channel and Intake Shelf           90         81         88         78         81         81         78         81         71           330         250         &lt;</td> <td>O&amp;M           Main Channel and Intake Shelf         Intake Shelf           90         81         88         78         81         81         78         78         81         71         84           330         250</td> <td>O&amp;M           Main Channel and Intake Shelf         Headword           90         81         88         78         81         81         78         78         81         71         84         78           330         250</td> <td>O&amp;M           Tot         Road         Main Channel and Intake Shelf         Headworks Step 1           90         81         88         78         81         81         78         81         71         84         78         81           330         250</td> <td>O&amp;M         Main Channel and Intake Shelf         Headworks Structur           90         81         88         78         81         81         78         81         71         84         78         81         74           330         250</td> <td>O&amp;M         Main Channel and Intake Shelf         Headworks Structure           90         81         88         78         81         81         78         81         71         84         78         81         74         74           330         250</td> <td>Tot         Road         Main Channel and Intake Shelf         Headworks Structure         Bldg           90         81         88         78         81         81         78         81         71         84         78         81         74         74         76           330         250</td>	O&M           Main Channel and Intake Shelf           90         81         88         78         81         81         78         78         81           330         250	O&M           Tot Road         Main Channel and Intake Shelf           90         81         88         78         81         81         78         81         71           330         250         <	O&M           Main Channel and Intake Shelf         Intake Shelf           90         81         88         78         81         81         78         78         81         71         84           330         250	O&M           Main Channel and Intake Shelf         Headword           90         81         88         78         81         81         78         78         81         71         84         78           330         250	O&M           Tot         Road         Main Channel and Intake Shelf         Headworks Step 1           90         81         88         78         81         81         78         81         71         84         78         81           330         250	O&M         Main Channel and Intake Shelf         Headworks Structur           90         81         88         78         81         81         78         81         71         84         78         81         74           330         250	O&M         Main Channel and Intake Shelf         Headworks Structure           90         81         88         78         81         81         78         81         71         84         78         81         74         74           330         250	Tot         Road         Main Channel and Intake Shelf         Headworks Structure         Bldg           90         81         88         78         81         81         78         81         71         84         78         81         74         74         76           330         250

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) 700

Table L-13. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

	difference Noise Level at 50 1 cet (ab.						Add to Single	Total
			Usage		Equipment	Number of	Source Level	Leq(h) @
Phase	<b>Equipment Description</b>	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
O&M Road								
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

— Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-14. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Residential Uses
Agricultural Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Atmospheric Attenuation (dBA)
	1-Hour O&M Noise Level at the Receptor (dBA)
	CNEL (O&M Noise + Existing) (dBA)
	Impact to Agricultural Uses

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Existing Noise Levels
Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

7000

Nighttime 45

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

L-214

Table L-13. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table L-13. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)										
Phase	Equipment Description	Tot	O&M Road			Main (	hanne	ı		
O&M Road		1.00	itteau			maiii C	, iiuiiiic	<u>.                                      </u>		
Levee O&M Road Regrading	12' Blade Grader (1)									
Main Channel										
Debris Removal	1.5 CY Front End Loader Crawler (1)									
	16 CY 3 Axle Dump Truck (1)									
	Pickup Truck Conventional (1)									
Vegetation Removal	56 HP Tractor Rotary Mower (1)									
	16 CY 3 Axle Dump Truck (1)									
	Pickup Truck Conventional (1)									
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)									
	16 CY 3 Axle Dump Truck (3)									
	Pickup Truck Conventional (2)									
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)									
	16 CY 3 Axle Dump Truck (2)									
	Pickup Truck Conventional (1)									
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)									
	16 CY 3 Axle Dump Truck (2)									
	Pickup Truck Conventional (1)									
Channel Repairs	0.75 CY Hydraulic Excavator (1)									
	16 CY 3 Axle Dump Truck (3)									
	Pickup Truck Conventional (2)									
Channel Inspection	Pickup Truck Conventional (1)									

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-14. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

Table E-14. 0-11001 Ope	ration & maintenance Hoise Level at the Neceptor (										
		Tot	O&M Road		Main Channel						
	Total O&M Leq(h) @ 50'	88	81	88 78 81 81 78 78 81							71
Residential Receptor											
	Distance from the Center of O&M Activity to a Receptor (ft)	270	250	250	250	250	250	250	250	250	250
	Distance Divergence (dBA)	14.6	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Atmospheric Attenuation (dBA)	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	1-Hour O&M Noise Level at the Receptor (dBA)	74	67	73	64	67	67	64	64	67	57
	CNEL (O&M Noise + Existing) (dBA)	70	64	70	61	64	64	62	62	64	58
	Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA
Agricultural Receptor											
	Distance from the Center of O&M Activity to a Receptor (ft)	90	80	80	80	80	80	80	80	80	80
	Distance Divergence (dBA)	5.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	Atmospheric Attenuation (dBA)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	1-Hour O&M Noise Level at the Receptor (dBA)	83	77	83	74	77	77	74	74	77	67
	CNEL (O&M Noise + Existing) (dBA)	80	73	80	70	73	73	70	70	73	64
	Impact to Agricultural Uses	CA	NA	CA	NA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

Normal Suburban Residential

Existing Noise Levels
Land Use Type
Background Noise (dBA)

Daytime 55

7000

Nighttime 45

Receptors:

Nearest residential receptor (ft)

Table L-15. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

							Add to Single	Total
			Usage	Equipment	Equipment	Number of	Source Level	Leq(h) @
Phase	<b>Equipment Description</b>	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
O&M Road								
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel and Intake Shelf								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Headworks Structure Operating Equipment								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

#### Table L-16. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

	Total O&M Leq(h) @ 50'
Residential Receptor	
	Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Residential Uses

Agricultural Receptor

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

1800

Receptors:

Nearest residential receptor (ft)

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-15. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

	dintenance Noise Level at 50 Feet (db/	<del>''</del>	1												HW
			о&м												Op
Phase	Equipment Description	Tot	Road	Main	Channe	el and In	take She	elf		Н	leadw	orks S	tructu	re	Eq
O&M Road									•						
Levee O&M Road Regrading	12' Blade Grader (1)														T
Main Channel and Intake Shelf	· ·			<u> </u>				<u> </u>							
Debris Removal	1.5 CY Front End Loader Crawler (1)														
	16 CY 3 Axle Dump Truck (1)														
	Pickup Truck Conventional (1)														
Vegetation Removal	56 HP Tractor Rotary Mower (1)														
	16 CY 3 Axle Dump Truck (1)														
	Pickup Truck Conventional (1)														
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)														
	16 CY 3 Axle Dump Truck (3)														
	Pickup Truck Conventional (2)														
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)														
	16 CY 3 Axle Dump Truck (2)														
	Pickup Truck Conventional (1)														
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)														
	16 CY 3 Axle Dump Truck (2)														
	Pickup Truck Conventional (1)														
Channel Repairs	0.75 CY Hydraulic Excavator (1)														
	16 CY 3 Axle Dump Truck (3)														
	Pickup Truck Conventional (2)														
Channel Inspection	Pickup Truck Conventional (1)														

Headworks Structure						
Debris Removal	1.5 CY Front End Loader Crawler (1)					
	16 CY 3 Axle Dump Truck (1)					
	Pickup Truck Conventional (1)					
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)					
	16 CY 3 Axle Dump Truck (3)					
	Pickup Truck Conventional (2)					
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)					
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)					
Headworks Structure Operating Equipment						
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)					
Test Operate Gates	Pickup Truck Conventional (1)					

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

Table L-16. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

Table L-10. 0-Hour Ope	ration & maintenance Noise Level at the Neceptor (																
			O&M														HW Qp
		Tot	Road	Main Channel and Intake Shelf							Headworks Structure						
	Total O&M Leq(h) @ 50'	90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76
Residential Receptor																	
	Distance from the Center of O&M Activity to a Receptor (ft)	320	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	Distance Divergence (dBA)	16.1	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Atmospheric Attenuation (dBA)	0.26	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	1-Hour O&M Noise Level at the Receptor (dBA)	74	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62
	CNEL (O&M Noise + Existing) (dBA)	70	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60
	Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA
Agricultural Receptor																	
	Distance from the Center of O&M Activity to a Receptor (ft)	110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	Distance Divergence (dBA)	6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	Atmospheric Attenuation (dBA)	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	1-Hour O&M Noise Level at the Receptor (dBA)	83	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72
	CNEL (O&M Noise + Existing) (dBA)	79	73	80	70	73	73	70	70	73	64	76	70	73	66	66	68
	Impact to Agricultural Uses	CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential Background Noise (dBA)

Daytime

Daytime 55

1800

Nighttime 45

Receptors:

Nearest residential receptor (ft)

Table L-17. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Phase	Equipment Description	RCNM Equipment Types	Usage Factor	Equipment Lmax @ 50'	Equipment Leq(h) @ 50'	Number of Equipment	Add to Single Source Level (dBA)	Total Leq(h) @ 50'
O&M Road		, , , , ,			N /			
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel and Intake Shelf	•							
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Headworks Structure Operating Equipment								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-18. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

Total O&M Leq(h) @ 50'

Residential Receptor

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)
Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Residential Uses

Agricultural Receptor

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75 Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55 Nighttime 45

Receptors:

Nearest residential receptor (ft)

8600

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-17. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Table L-17. 6-Hour Operation & Ma		<u>,                                     </u>								HW		
			O&M									
Phase	Equipment Description	Tot	Road	Main Ch	annel and	Intake S	helf	Headw	orks Structure	Eq		
O&M Road				 								
Levee O&M Road Regrading	12' Blade Grader (1)											
Main Channel and Intake Shelf												
Debris Removal	1.5 CY Front End Loader Crawler (1)											
	16 CY 3 Axle Dump Truck (1)											
	Pickup Truck Conventional (1)											
Vegetation Removal	56 HP Tractor Rotary Mower (1)											
	16 CY 3 Axle Dump Truck (1)											
	Pickup Truck Conventional (1)											
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)											
	16 CY 3 Axle Dump Truck (3)											
	Pickup Truck Conventional (2)											
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)											
	16 CY 3 Axle Dump Truck (2)											
	Pickup Truck Conventional (1)											
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)											
	16 CY 3 Axle Dump Truck (2)											
	Pickup Truck Conventional (1)											
Channel Repairs	0.75 CY Hydraulic Excavator (1)											
	16 CY 3 Axle Dump Truck (3)											
	Pickup Truck Conventional (2)											
Channel Inspection	Pickup Truck Conventional (1)											

Headworks Structure						
Debris Removal	1.5 CY Front End Loader Crawler (1)					
	16 CY 3 Axle Dump Truck (1)					
	Pickup Truck Conventional (1)					
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)					
	16 CY 3 Axle Dump Truck (3)					
	Pickup Truck Conventional (2)					
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)					
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)					
Headworks Structure Operating Equipment						
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)					
Test Operate Gates	Pickup Truck Conventional (1)					

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

Table L-18. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

	`															11347
																HW
		O&M													Op	
	Tot	Road	Main Channel and Intake Shelf								H	leadw	orks S	tructui	e	Eq
Total O&M Leq(h) @ 5	0' 90	81	88	78	81	81	78	78	81	71	84	78	81	74	74	76
Residential Receptor																
Distance from the Center of O&M Activity to a Receptor (	t) 320	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Distance Divergence (dB/	() 16.1	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Atmospheric Attenuation (dB/	0.26	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
1-Hour O&M Noise Level at the Receptor (dB/	74	67	73	64	67	67	64	64	67	57	70	64	67	60	60	62
CNEL (O&M Noise + Existing) (dBA	70	64	70	61	64	64	62	62	64	58	66	61	64	59	59	60
Impact to Residential Use	s CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	NA	NA	CA
Agricultural Receptor																
Distance from the Center of O&M Activity to a Receptor (	t) 110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Distance Divergence (dB/	6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Atmospheric Attenuation (dB/	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1-Hour O&M Noise Level at the Receptor (dB/	3) 83	77	83	74	77	77	74	74	77	67	80	74	77	70	70	72
CNEL (O&M Noise + Existing) (dBA	() 79	73	80	70	73	73	70	70	73	64	76	70	73	66	66	68
Impact to Agricultural Use	s CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft)

8600

Table L-19. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

							Add to Single	Total
			Usage	Equipment	Equipment	Number of	Source Level	Leq(h) @
Phase	Equipment Description	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
O&M Road	·							-
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Agricultural Channel and Intake								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Clearing and Grubbing	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Bridge								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Bridge Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Bridge Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-20. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

Total O&M Leq(h) @ 50'
------------------------

**Residential Receptor** 

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Residential Uses

**Agricultural Receptor** 

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft)

8000

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Table L-19. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Phase	Equipment Description	Tot	O&M Road	Agricultu	ıral Ch	annel a	and Int	ake	Brid ge
O&M Road	<u> </u>			<b>J</b>					
Levee O&M Road Regrading	12' Blade Grader (1)								
Agricultural Channel and Intake									
Debris Removal	1.5 CY Front End Loader Crawler (1)								
	16 CY 3 Axle Dump Truck (1)								
	Pickup Truck Conventional (1)								
Vegetation Removal	56 HP Tractor Rotary Mower (1)								
	16 CY 3 Axle Dump Truck (1)								
	Pickup Truck Conventional (1)								
Clearing and Grubbing	0.75 CY Hydraulic Excavator (1)								
	16 CY 3 Axle Dump Truck (3)								
	Pickup Truck Conventional (2)								
Channel Repairs	0.75 CY Hydraulic Excavator (1)								
	16 CY 3 Axle Dump Truck (3)								
	Pickup Truck Conventional (2)								
Channel Inspection	Pickup Truck Conventional (1)								
Bridge									
Debris Removal	1.5 CY Front End Loader Crawler (1)								
	16 CY 3 Axle Dump Truck (1)								
	Pickup Truck Conventional (1)								
Bridge Upkeep	Pickup Truck Conventional (2)								
Bridge Inspection	Pickup Truck Conventional (2)								

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-20. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

•												
		Tot	O&M Road	Agr	icultu	ultural Channel and Intake						
	Total O&M Leq(h) @ 50'	0' 88 81 87 78 81 81 81 71						80				
Residential Receptor												
	Distance from the Center of O&M Activity to a Receptor (ft)	270	220	220	220	220	220	220	220	220		
	Distance Divergence (dBA)	14.6	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9		
	Atmospheric Attenuation (dBA)	0.22	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18		
	1-Hour O&M Noise Level at the Receptor (dBA)	73	68	73	65	68	68	68	58	67		
	CNEL (O&M Noise + Existing) (dBA)	70	65	70	62	65	65	65	58	64		
	Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	NA	CA		
Agricultural Receptor												
	Distance from the Center of O&M Activity to a Receptor (ft)	90	70	70	70	70	70	70	70	70		
	Distance Divergence (dBA)	5.1	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9		
	Atmospheric Attenuation (dBA)	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		
	1-Hour O&M Noise Level at the Receptor (dBA)	83	78	84	75	78	78	78	68	77		
	CNEL (O&M Noise + Existing) (dBA)	79	74	80	71	74	74	74	65	74		
	Impact to Agricultural Uses	CA	NA	CA	NA	NA	NA	NA	NA	NA		

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft)

8000

#### **Operational Noise - Equipment** Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-21. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

							Add to Single	Total
			Usage		Equipment	Number of	Source Level	Leq(h) @
Phase	Equipment Description	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
O&M Road								
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
·	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
. , , , ,	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
•	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Berm/Levee		<u> </u>						
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Water Control Structure & Culvert		r tettap traeti	1			_	-	
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
Coamona (Tot Conamons)	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Buildings	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			_			-	
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Water Control Structure Operating Equipm		I. ionap iraan	1070			_	- J	
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Test Operate Gates	I long Hack Conventional (1)	I lokup Huok	10 /0			'		<u> </u>

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance. February 14.

#### **Operational Noise - Equipment**

Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-22. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

Total O&M Leq(h) @ 50'

**Residential Receptor** 

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Residential Uses

Agricultural Receptor

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

\*Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise

(dBA) Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft)

2600

# Operational Noise - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Al

Table L-21. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

Dhasa	Fault mant Description	<b>-</b>	0&1		Main Oba and	D	Water Cor				
Phase	Equipment Description	lot	Roa	1	Main Channel		Berm		Culver	t	Bldg
O&M Road	Trouble to the trouble						Т Т				
Levee O&M Road Regrading	12' Blade Grader (1)										
Main Channel											
Debris Removal	1.5 CY Front End Loader Crawler (1)										
	16 CY 3 Axle Dump Truck (1)										
	Pickup Truck Conventional (1)										
Vegetation Removal	56 HP Tractor Rotary Mower (1)										
	16 CY 3 Axle Dump Truck (1)										
	Pickup Truck Conventional (1)										
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)										
	16 CY 3 Axle Dump Truck (3)										
	Pickup Truck Conventional (2)										
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)										
1 ,	16 CY 3 Axle Dump Truck (2)										
	Pickup Truck Conventional (1)										
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)										
( <b>.</b>	16 CY 3 Axle Dump Truck (2)										
	Pickup Truck Conventional (1)										
Channel Repairs	0.75 CY Hydraulic Excavator (1)										
	16 CY 3 Axle Dump Truck (3)										
	Pickup Truck Conventional (2)										
Channel Inspection	Pickup Truck Conventional (1)										
Berm/Levee	rickap track conventional (1)										
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)										
Berni, Levee Repairs	16 CY 3 Axle Dump Truck (3)										
	Pickup Truck Conventional (2)										
Water Control Structure & Culvert	Fickup Truck Conventional (2)										
Debris Removal	1.5 CY Front End Loader Crawler (1)						<del>- 1</del>				
Deblis Removal	16 CY 3 Axle Dump Truck (1)										
Onding at Day and (Mat One ditions)	Pickup Truck Conventional (1)										
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)										
	16 CY 3 Axle Dump Truck (3)										
	Pickup Truck Conventional (2)										
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)										
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)										
Buildings								T T			
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)										
	Pickup Truck Conventional (2)										
Water Control Structure Operating Equipm											
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)										
Test Operate Gates	Pickup Truck Conventional (1)										

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

- Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

February 14.

#### **Operational Noise - Equipment** Northern Water Control Structure and Sturgeon Bypass Channel (Al

Table L-22. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

Table L-22. 0-Hour Oper	ration & maintenance Noise Level at the Neceptor (																	
		Tot	O&M Road								Berm	Water Control Structure & Culvert			re &	Bldg		
	Total O&M Leq(h) @ 50'	91	81	88	78	81	81	78	78	81	71	81	84	78	81	74	74	76
Residential Receptor																		
	Distance from the Center of O&M Activity to a Receptor (ft)	350	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	Distance Divergence (dBA)	16.9	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Atmospheric Attenuation (dBA)	0.29	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	1-Hour O&M Noise Level at the Receptor (dBA)	73	67	73	64	67	67	64	64	67	57	67	70	64	67	60	60	62
	CNEL (O&M Noise + Existing) (dBA)	70	64	70	61	64	64	62	62	64	58	64	66	61	64	59	59	60
	Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	CA	NA	NA	CA
Agricultural Receptor																		
	Distance from the Center of O&M Activity to a Receptor (ft)	110	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	Distance Divergence (dBA)	6.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	Atmospheric Attenuation (dBA)	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	1-Hour O&M Noise Level at the Receptor (dBA)		77	83	74	77	77	74	74	77	67	77	80	74	77	70	70	72
	CNEL (O&M Noise + Existing) (dBA)	80	73	80	70	73	73	70	70	73	64	73	76	70	73	66	66	68
	Impact to Agricultural Uses	CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

**Background Noise** (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) Source: Google Earth

2600

## **Operational Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)**

Table L-23. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

-							Add to Single	
			Usage		Equipment	Number of	Source Level	,
Phase	Equipment Description	RCNM Equipment Types	Factor	Lmax @ 50'	Leq(h) @ 50'	Equipment	(dBA)	50'
O&M Road								
Levee O&M Road Regrading	12' Blade Grader (1)	Grader	40%	85	81	1	0	81
Main Channel								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Vegetation Removal	56 HP Tractor Rotary Mower (1)	Tractor	40%	84	80	1	0	80
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	Crane	16%	81	73	1	0	73
	16 CY 3 Axle Dump Truck (2)	Dump Truck	40%	76	72	2	3	75
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Channel Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
·	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Channel Inspection	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Berm/Levee								
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
·	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Water Control Structure & Culvert								
Debris Removal	1.5 CY Front End Loader Crawler (1)	Front End Loader	40%	79	75	1	0	75
	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	Excavator	40%	81	77	1	0	77
,	16 CY 3 Axle Dump Truck (3)	Dump Truck	40%	76	72	3	5	77
	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Buildings	` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `							
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Dump Truck	40%	76	72	1	0	72
3.,,,,,	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Water Control Structure Operating Equipm		· · ·						
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	Pickup Truck	40%	75	71	2	3	74
Test Operate Gates	Pickup Truck Conventional (1)	Pickup Truck	40%	75	71	1	0	71
Course: UDB 2017 Vole Bunges Colmoni								

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

## Operational Noise - Equipment

**Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)** 

Table L-24. 8-Hour Operation & Maintenance Noise Level at the Receptor (dBA)

Total O&M Leq(h) @ 50'

**Residential Receptor** 

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Residential Uses

Agricultural Receptor

Distance from the Center of O&M Activity to a Receptor (ft)

Distance Divergence (dBA)

Atmospheric Attenuation (dBA)

1-Hour O&M Noise Level at the Receptor (dBA)

CNEL (O&M Noise + Existing) (dBA)

Impact to Agricultural Uses

\*Distances are the minimum distances that can still achieve noise levels within Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft)

800

## Operational Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

Table L-23. 8-Hour Operation & Maintenance Noise Level at 50 Feet (dBA)

												 _	_	_	_		
Phase	Equipment Description	Tot		&M		Main (	Channe	N.			Berm	ter Co	ntrol S Culver		re &	Bldg	Op Eq
O&M Road	Equipment Description	100	IN	Jau		IVIAIII C	manne	<del> </del>			Dellii	'	Cuivei			Blug	
Levee O&M Road Regrading	12' Blade Grader (1)																
Main Channel	(.)						1										
Debris Removal	1.5 CY Front End Loader Crawler (1)		г														
	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (1)																
Vegetation Removal	56 HP Tractor Rotary Mower (1)																
l	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (1)																
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																
(**************************************	16 CY 3 Axle Dump Truck (3)																
	Pickup Truck Conventional (2)																
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)																
(winter repair)	16 CY 3 Axle Dump Truck (2)																
	Pickup Truck Conventional (1)																
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																
(Majer repair)	16 CY 3 Axle Dump Truck (2)																
	Pickup Truck Conventional (1)																
Channel Repairs	0.75 CY Hydraulic Excavator (1)																<del></del>
Onarmor Ropano	16 CY 3 Axle Dump Truck (3)																
	Pickup Truck Conventional (2)																
Channel Inspection	Pickup Truck Conventional (1)																
Berm/Levee	Tionap Truck Conventional (1)																
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)						1										
Demi Levee Repairs	16 CY 3 Axle Dump Truck (3)																
	Pickup Truck Conventional (2)																
Water Control Structure & Culvert	Tickup Truck Conventional (2)																
Debris Removal	1.5 CY Front End Loader Crawler (1)				<u> </u>												
Deblis Kellioval	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (1)																
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																<del></del>
Sediment Removal (Wet Conditions)	16 CY 3 Axle Dump Truck (3)																
	Pickup Truck Conventional (2)																
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																<del></del>
	1 ()																
Gates and Concrete Structure Inspection Buildings	Pickup Truck Conventional (2)																
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)																
Lydipilietit bullding (Major Repair)	Pickup Truck Conventional (2)																1
Water Control Structure Operating Equip																	
Mechanical Hydraulic Equipment Upkeep																	
Test Operate Gates	Pickup Truck Conventional (1)					1			1	1		1	1	1	1	1	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

## Operational Noise - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

Table L-24. 8-Hour Operation & Maintenance Noise Level at the Receptor (c

Table L-24. 0-Hour Oper	ation & Maintenance Noise Level at the Neceptor (	•																	
			O&M Road			ı	Main C	hanne	I			Berm		er Cor	ntrol S		e &	Bldg	Op Eq
	Total O&M Leq(h) @ 50'	91	81	88	78	81	81	78	78	81	71	81	84	78	81	74	74	76	76
Residential Receptor																			
	Distance from the Center of O&M Activity to a Receptor (ft)	350	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	Distance Divergence (dBA)	16.9	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Atmospheric Attenuation (dBA)	0.29	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	1-Hour O&M Noise Level at the Receptor (dBA)	73	67	73	64	67	67	64	64	67	57	67	70	64	67	60	60	62	62
	CNEL (O&M Noise + Existing) (dBA)	70	64	70	61	64	64	62	62	64	58	64	66	61	64	59	59	60	60
	Impact to Residential Uses	CA	CA	CA	CA	CA	CA	CA	CA	CA	NA	CA	CA	CA	CA	NA	NA	CA	CA
Agricultural Receptor																			
	Distance from the Center of O&M Activity to a Receptor (ft)		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	Distance Divergence (dBA)		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	Atmospheric Attenuation (dBA)		0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
	1-Hour O&M Noise Level at the Receptor (dBA)		77	83	74	77	77	74	74	77	67	77	80	74	77	70	70	72	72
	CNEL (O&M Noise + Existing) (dBA)		73	80	70	73	73	70	70	73	64	73	76	70	73	66	66	68	68
	Impact to Agricultural Uses	CA	NA	CA	NA	NA	NA	NA	NA	NA	NA	NA	CA	NA	NA	NA	NA	NA	NA

<sup>\*</sup>Distances are the minimum distances that can still achieve noise levels within

Conditionally Acceptable limits, except when there is a closer receptor.

Significance Level

(dBA)

Residential

Normally Acceptable 60

Conditionally Acceptable 70

Agricultural

Normally Acceptable 75

Conditionally Acceptable 80

**Existing Noise Levels** 

Land Use Type Normal Suburban Residential

Background Noise (dBA)

Daytime 55

Nighttime 45

Receptors:

Nearest residential receptor (ft) 800

Table L-27. Alt 1 Daily O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without O&M Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117	56,400	801	112	55	10.4	8,438	64,838	1.1	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	801	112	55	10.4	8,438	64,638	1.2	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-28. Alt 1 Peak Hourly O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117	5,640	801	56	55	10.4	8,382	14,022	2.5	4	12	No
Interstate	I-5	CR 117 to CR 102	5,620	801	56	55	10.4	8,382	14,002	2.5	4	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-29. Alt 2 Daily O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without O&M Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		802	112	55	10.4	8,456	64,856	1.1	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	802	112	55	10.4	8,456	64,656	1.2	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-30. Alt 2 Peak Hourly O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		802	56	55	10.4	8,400	14,040	2.5	4	12	No
Interstate	I-5	CR 117 to CR 102	5,620	802	56	55	10.4	8,400	14,020	2.5	4	12	No

ssume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-31. Alt 3 Daily O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without O&M Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		840	114	55	10.4	8,848	65,248	1.2	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	840	114	55	10.4	8,848	65,048	1.2	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-32. Alt 3 Peak Hourly O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		840	57	55	10.4	8,791	14,431	2.6	4	12	No
Interstate	I-5	CR 117 to CR 102	5,620	840	57	55	10.4	8,791	14,411	2.6	4	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-33. Alt 4 Daily O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without O&M Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		1,719	178	55	10.4	18,058	74,458	1.3	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	1,719	178	55	10.4	18,058	74,258	1.3	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-34. Alt 4 Peak Hourly O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		1,719	89	55	10.4	17,969	23,609	4.2	6	12	No
Interstate	I-5	CR 117 to CR 102	5,620	1,719	89	55	10.4	17,969	23,589	4.2	6	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-35. Alt 5 Daily O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without O&M Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117	56,400	784	114	55	10.4	8,271	64,671	1.1	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	784	114	55	10.4	8,271	64,471	1.1	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-36. Alt 5 Peak Hourly O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117	5,640	784	57	55	10.4	8,214	13,854	2.5	4	12	No
Interstate	I-5	CR 117 to CR 102	5,620	784	57	55	10.4	8,214	13,834	2.5	4	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-37. Alt 6 Daily O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	2015 AADT without O&M Traffic	Peak Daily Truck Trips	Peak Daily Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio	Noise Level Increase (dBA)	Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		1,247	138	55	10.4	13,105	69,505	1.2	1	12	No
Interstate	I-5	CR 117 to CR 102	56,200	1,247	138	55	10.4	13,105	69,305	1.2	1	12	No

Source:

Caltrans. 2015 AADT Volumes.

Caltrans. 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. September.

Table L-38. Alt 6 Peak Hourly O&M Traffic - Equivalent Noise Levels

Туре	Roadway	Segment	Peak Hourly Volume	Peak Hour Truck Trips	Peak Hour Worker Trips	Average Speed	Equivalency Factor for Heavy-Duty Vehicles	Equivalent Vehicles	Total with Project	Increase Ratio		Substantial Noise Increase (dBA)	Above Threshold?
Interstate	I-5	Sacramento/Yolo County Line to CR 117		1,247	69	55	10.4	13,036	18,676	3.3	5	12	No
Interstate	I-5	CR 117 to CR 102	5,620	1,247	69	55	10.4	13,036	18,656	3.3	5	12	No

Assume

10% of daily traffic occurs during peak hour.

Assume half of worker trips and all truck trips occur during a peak hour.

Table L-104. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
O&M Road	The second secon	1	4-1	( 2222)	,	( )	( )	
O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-
Main Channel and Intake Shelf	. ,							
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	- !
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	- !
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	1	-	-	6	-
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Headworks Structure Operating Equipment								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

#### Table L-105. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
_	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

7500

Table L-104. Operation & Maintenan	ce Vibration and Ground-Borne Vibrat	i													
Phase	Equipment Description	Tot	O&N Road		Main Channe	al and Int	aka Si	a a lé		المحطاء المحطاء	auko Ct	ructure		Bldg	HW Op Eq
O&M Road	Equipment Description	100	Noa	u	Walli Chaille	and mi	ake Si	ieii	<u>                                     </u>	1eauw	JIKS SI	ructure	<del>'</del>	Blug	<u> </u>
O&M Road Regrading	12' Blade Grader (1)								Т						
Main Channel and Intake Shelf	(.)														
Debris Removal	1.5 CY Front End Loader Crawler (1)			1											
	16 CY 3 Axle Dump Truck (1)														1
	Pickup Truck Conventional (1)														1
Vegetation Removal	56 HP Tractor Rotary Mower (1)														
· ·	16 CY 3 Axle Dump Truck (1)														1
	Pickup Truck Conventional (1)														1
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)														
, ,	16 CY 3 Axle Dump Truck (3)														1
	Pickup Truck Conventional (2)														1
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)														
	16 CY 3 Axle Dump Truck (2)														1
	Pickup Truck Conventional (1)														ı
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)														
	16 CY 3 Axle Dump Truck (2)														ı
	Pickup Truck Conventional (1)														1
Channel Repairs	0.75 CY Hydraulic Excavator (1)														
	16 CY 3 Axle Dump Truck (3)														1
	Pickup Truck Conventional (2)														1
Channel Inspection	Pickup Truck Conventional (1)														
Headworks Structure			-												
Debris Removal	1.5 CY Front End Loader Crawler (1)														
	16 CY 3 Axle Dump Truck (1)														1
	Pickup Truck Conventional (1)														
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)														
	16 CY 3 Axle Dump Truck (3)														1
	Pickup Truck Conventional (2)														
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)														
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)														
Buildings															
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)											T			_
	Pickup Truck Conventional (2)														
Headworks Structure Operating Equipmen															
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)														
Test Operate Gates	Pickup Truck Conventional (1)														

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-105. Operation & Maintenance Vibration Level at the Receptor

																		HW
	_	1	M&0							. 16		Ι.					D	Op
	10	ot R	oad		IVI	iin Cha	annei a	and Inta	ake Sn	eit		<u> </u>	leadwo	orks St	ructur	е	Bldg	Eq
Building Damage																		
Total PPV @	25' 1.	29 I	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a	0.3	0.08	0.23	n/a	n/a	0.08	n/a
Distance from the Center of O&M Activity to a Receptor	or (ft) 9	0	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
PPV at the Receptor (in	/sec) 0.	19 ı	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	0.02	n/a
Impact to Rece	eptor n	0 1	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a
Human Annoyance																		
Total Lv @	25' 1°	11 I	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	86	n/a
Distance from the Center of O&M Activity to a Receptor	or (ft) 49	90 3	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
Distance Divergence (	dBA) 38	.8 3	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
Lv at the Receptor (	VdB) 7	2 1	n/a	72	50	50	60	56	56	60	n/a	62	50	60	n/a	n/a	50	n/a
Impact to Rece	eptor n	0 0	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

7500

Table L-106. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
O&M Road								
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-
Main Channel and Intake Shelf								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-		-	6	-
Headworks Structure Operating Equipmen								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	•	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-107. Operation & Maintenance Vibration Level at the Receptor

<b>Building Damage</b>	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

4200

Table L-106. Operation & Maintenance Vibration and Ground-Borne Vibration

			O&M	1														HW Op
Phase	Equipment Description	Tot	Road		M	ain Ch	annel a	and In	ake Sh	elf		H	leadw	orks S	tructu	re	Bldg	Eq
O&M Road							_											
Levee O&M Road Regrading	12' Blade Grader (1)																	
Main Channel and Intake Shelf																		
Debris Removal	1.5 CY Front End Loader Crawler (1)																	1
	16 CY 3 Axle Dump Truck (1)																	1
	Pickup Truck Conventional (1)																	
Vegetation Removal	56 HP Tractor Rotary Mower (1)																	
	16 CY 3 Axle Dump Truck (1)																	1
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																	
	16 CY 3 Axle Dump Truck (3)																	1
	Pickup Truck Conventional (2)																	1
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)																	
	16 CY 3 Axle Dump Truck (2)																	1
	Pickup Truck Conventional (1)																	
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																	
	16 CY 3 Axle Dump Truck (2)																	
	Pickup Truck Conventional (1)																	
Channel Repairs	0.75 CY Hydraulic Excavator (1)																	
	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Channel Inspection	Pickup Truck Conventional (1)															1		
Headworks Structure	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																	
Debris Removal	1.5 CY Front End Loader Crawler (1)																	
	16 CY 3 Axle Dump Truck (1)																	
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)															1		
,	16 CY 3 Axle Dump Truck (3)																	1
	Pickup Truck Conventional (2)																	
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																	
Gates and Concrete Structure Inspection						<del>                                     </del>												
Buildings	1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2																	
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)						T									T		
[-1	Pickup Truck Conventional (2)																	1
Headworks Structure Operating Equipme																		
Mechanical Hydraulic Equipment Upkeep							T									T		
Test Operate Gates	Pickup Truck Conventional (1)																	
0 //DD 0047 // D 0 /				1	1		1				1	1	1				1	_

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-107. Operation & Maintenance Vibration Level at the Receptor

			O&M															HW
	٦	- 1	Road		Ma	in Cha	annel a	ınd Inta	ake Sh	elf		н	leadwo	orks St	ructur	е	Bldg	Op Eq
Building Damage		-	•								•							
Total	PPV @ 25' 1	.29	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a	0.3	0.08	0.23	n/a	n/a	0.08	n/a
Distance from the Center of O&M Activity to a F	Receptor (ft)	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
PPV at the Rece	otor (in/sec) 0	).19	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	0.02	n/a
Impact	to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a
Human Annoyance																		
То	tal Lv @ 25' 1	111	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	86	n/a
Distance from the Center of O&M Activity to a F	Receptor (ft) 4	490	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
Distance Diverg	ence (dBA) 3	38.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
Lv at the Rec	eptor (VdB)	72	n/a	72	50	50	60	56	56	60	n/a	62	50	60	n/a	n/a	50	n/a
Impact	to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

4200

Table L-108. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
O&M Road			1 - 4 1	(iiiiii)		(/	(1)	1 = 1 (1 = 7
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-
Main Channel and Intake Shelf	· · · · · · · · · · · · · · · · · · ·		•					,
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
·	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Headworks Structure Operating Equipmen	t							
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

#### Table L-109. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

700

Receptors:

Nearest residential receptor (ft)
Source: Google Earth

ft)

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

Table L-108. Operation & Maintenand	ce Vibration and Ground-Borne Vibrat	i(	,														
Phase	Equipment Description	Tot	O&N Roa		lain	Char	nnel ar	nd Inte	ako SI	nelf		Headw	orks Si	ructur	<b>'</b> A	Bldg	HW Op Eq
O&M Road	- Leadiplicité Description	100	Inca	u	laili	Onai	inci ai	iu iiit	are or	ICII	<u> </u>	icauw	OI KS OI	ructui	<u> </u>	Diag	4
Levee O&M Road Regrading	12' Blade Grader (1)				Т												
Main Channel and Intake Shelf				_													
Debris Removal	1.5 CY Front End Loader Crawler (1)			1													
	16 CY 3 Axle Dump Truck (1)																1
	Pickup Truck Conventional (1)																1
Vegetation Removal	56 HP Tractor Rotary Mower (1)																
	16 CY 3 Axle Dump Truck (1)																1
	Pickup Truck Conventional (1)																1
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																
, , ,	16 CY 3 Axle Dump Truck (3)																1
	Pickup Truck Conventional (2)																1
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)																
	16 CY 3 Axle Dump Truck (2)																1
	Pickup Truck Conventional (1)																1
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																
	16 CY 3 Axle Dump Truck (2)																1
	Pickup Truck Conventional (1)																1
Channel Repairs	0.75 CY Hydraulic Excavator (1)																
	16 CY 3 Axle Dump Truck (3)																1
	Pickup Truck Conventional (2)																1
Channel Inspection	Pickup Truck Conventional (1)																
Headworks Structure																	
Debris Removal	1.5 CY Front End Loader Crawler (1)																
	16 CY 3 Axle Dump Truck (1)																1
	Pickup Truck Conventional (1)																
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																1
	16 CY 3 Axle Dump Truck (3)																1
	Pickup Truck Conventional (2)																
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)																
Buildings																	
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)																,
	Pickup Truck Conventional (2)																
Headworks Structure Operating Equipment																	
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)																
Test Operate Gates	Pickup Truck Conventional (1)																

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-109. Operation & Maintenance Vibration Level at the Receptor

			O&M															HW Op
		Tot	Road		Ma	in Cha	annel a	ind Int	ake Sh	elf		Н	leadwo	orks St	ructur	е	Bldg	Eq
<b>Building Damage</b>																		
	Total PPV @ 25'	1.29	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a	0.3	0.08	0.23	n/a	n/a	0.08	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	PPV at the Receptor (in/sec)	0.19	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	0.02	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a
Human Annoyance																		
	Total Lv @ 25'	111	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	86	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
	Distance Divergence (dBA)	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
	Lv at the Receptor (VdB)	67	n/a	64	43	43	52	49	49	52	n/a	55	43	52	n/a	n/a	43	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

## Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

700

Table L-110. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
O&M Road	<u> </u>			, ,	,	,		
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-
Main Channel and Intake Shelf	<u> </u>		•					
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure		•	-					
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	•	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	•	-	-	6	-
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Headworks Structure Operating Equipment								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-111. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

## Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

700

Receptors:

Nearest residential receptor (ft)
Source: Google Earth

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

Table L-110. Operation & Maintenance Vibration and Ground-Borne Vibration

																	HW
			0&	м													Op
Phase	Equipment Description	Tot	1		Main	Chan	nel ar	nd Inta	ake Sh	nelf	H	Headw	orks St	tructur	е	Bldg	Eq
O&M Road																	
Levee O&M Road Regrading	12' Blade Grader (1)																
Main Channel and Intake Shelf																	
Debris Removal	1.5 CY Front End Loader Crawler (1)																
	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (1)																
Vegetation Removal	56 HP Tractor Rotary Mower (1)																
	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (1)																
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																
	16 CY 3 Axle Dump Truck (3)																
	Pickup Truck Conventional (2)																
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)																
	16 CY 3 Axle Dump Truck (2)																
	Pickup Truck Conventional (1)																
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																
	16 CY 3 Axle Dump Truck (2)																
	Pickup Truck Conventional (1)																
Channel Repairs	0.75 CY Hydraulic Excavator (1)																
	16 CY 3 Axle Dump Truck (3)																
	Pickup Truck Conventional (2)																
Channel Inspection	Pickup Truck Conventional (1)																
Headworks Structure		<u> </u>															
Debris Removal	1.5 CY Front End Loader Crawler (1)																
	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (1)																
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																
	16 CY 3 Axle Dump Truck (3)																
	Pickup Truck Conventional (2)																
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)																
Buildings																	
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (2)																1
Headworks Structure Operating Equipmen												•					
Mechanical Hydraulic Equipment Upkeep																	
Test Operate Gates	Pickup Truck Conventional (1)																

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-111. Operation & Maintenance Vibration Level at the Receptor

																		HW
_		Tot	O&M Road		Ma	ain Cha	annel a	and Inta	ake Sh	elf		H	leadwo	orks St	ructur	е	Bldg	Op Eq
<b>Building Damage</b>																		
	Total PPV @ 25'	1.29	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a	0.3	0.08	0.23	n/a	n/a	0.08	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	PPV at the Receptor (in/sec)	0.19	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	0.02	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a
Human Annoyance																		
	Total Lv @ 25'	111	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	86	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
	Distance Divergence (dBA)	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
	Lv at the Receptor (VdB)	67	n/a	64	43	43	52	49	49	52	n/a	55	43	52	n/a	n/a	43	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

700

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

Table L-112. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
O&M Road								
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-
Main Channel and Intake Shelf		•						
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Headworks Structure Operating Equipmen	t							
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

#### Table L-113. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

3800

Table L-112, Operation & Maintenance Vibration and Ground-Borne Vibration

Table L-112. Operation & Maintenan	ce Vibration and Ground-Borne Vibra	ati(	_															
				&М.									Headworks Structure					HW Op
Phase	Equipment Description	Tot	Ro	oad	Ma	in Ch	annel a	nd Inta	ake Sl	nelf		<u> </u>	<del>leadw</del>	orks S	tructur	е	Bldg	Eq
O&M Road	Training to the state of the st				<u> </u>	I	1			ı		1	1		I			
Levee O&M Road Regrading	12' Blade Grader (1)																	
Main Channel and Intake Shelf						ī	<del>                                     </del>			_	_	1			1			
Debris Removal	1.5 CY Front End Loader Crawler (1)																	
	16 CY 3 Axle Dump Truck (1)																	
	Pickup Truck Conventional (1)																	
Vegetation Removal	56 HP Tractor Rotary Mower (1)																	
	16 CY 3 Axle Dump Truck (1)																	
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																	
	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)																	
	16 CY 3 Axle Dump Truck (2)																	
	Pickup Truck Conventional (1)																	
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																	
, , , ,	16 CY 3 Axle Dump Truck (2)																	
	Pickup Truck Conventional (1)																	
Channel Repairs	0.75 CY Hydraulic Excavator (1)																	
•	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Channel Inspection	Pickup Truck Conventional (1)																	
Headworks Structure			_								<u>'</u>							
Debris Removal	1.5 CY Front End Loader Crawler (1)																	
	16 CY 3 Axle Dump Truck (1)																	
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																	
(	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																	
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)																	
Buildings																		
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)																	
-4	Pickup Truck Conventional (2)																	
Headworks Structure Operating Equipmen																		
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)																	
Test Operate Gates	Pickup Truck Conventional (1)			$\dashv$									+				$\vdash$	
Tool Operate Oates	i lokup i luok Oolivelilioliai (1)																	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-113. Operation & Maintenance Vibration Level at the Receptor

			O&M															HW Op
_		Tot	Road		Ma	in Cha	annel a	and Int	ake Sh	elf		Н	leadwo	orks St	tructur	е	Bldg	Eq
<b>Building Damage</b>																		
	Total PPV @ 25'	1.29	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a	0.3	0.08	0.23	n/a	n/a	0.08	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	PPV at the Receptor (in/sec)	0.19	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	0.02	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a
Human Annoyance																		
	Total Lv @ 25'	111	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	86	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	490	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
	Distance Divergence (dBA)	38.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
	Lv at the Receptor (VdB)	72	n/a	72	50	50	60	56	56	60	n/a	62	50	60	n/a	n/a	50	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

3800

Table L-114. Operation & Maintenance Vibration and Ground-Borne Vibration

Table L-114. Operation & Maintenan  Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)
O&M Road	Lquipment Description	Lookup Equipment Types	Lquipinent	(III/Sec)	25 11 (11/360)	(Vab)	(VUB)	25 it (Vub)
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	T -		0	Ι -
Main Channel and Intake Shelf	12 Blade Grader (1)	Tiva	<u> </u>				Ů	
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	I -
2 5 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	<del>                                     </del>
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1 1	-	-	-	0	_
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
, , , , , , , , , , , , , , , , , , , ,	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	_	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
, , ,	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure		•			•			
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	•	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	1	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	1	-	-	6	-
Buildings								
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (2)	n/a	2	-		-	6	-
Headworks Structure Operating Equipmen								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.
 February 14.

#### Table L-115. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft) Source: Google Earth

700

Table L-114. Operation & Maintena	nce Vibration and Ground-Borne Vibra	atic																
Disease	Environment Description	T-1		&M	Main Channel and Intake Shelf							Headworks Structure					DI.I.	HW Op
Phase O&M Road	Equipment Description	Tot	IKO	ad	Mai	n Cha	annei ar	nd Inta	ke Sr	neit			Headw	orks S	tructui	re	Bldg	Eq
Levee O&M Road Regrading	12' Blade Grader (1)											l					l	
Main Channel and Intake Shelf	12 Blade Grader (1)																	
Debris Removal	1.5 CY Front End Loader Crawler (1)							Т					1					
Deblis Keliloval	16 CY 3 Axle Dump Truck (1)																	!
	Pickup Truck Conventional (1)																	!
Vegetation Removal	56 HP Tractor Rotary Mower (1)			-														-
V ogotation romoval	16 CY 3 Axle Dump Truck (1)																	!
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)			$\neg$														$\vdash$
Commons romeral (rest commune)	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	!
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)			$\neg$														
, ,	16 CY 3 Axle Dump Truck (2)																	
	Pickup Truck Conventional (1)																	
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																	
	16 CY 3 Axle Dump Truck (2)																	!
	Pickup Truck Conventional (1)																	!
Channel Repairs	0.75 CY Hydraulic Excavator (1)																	
·	16 CY 3 Axle Dump Truck (3)																	!
	Pickup Truck Conventional (2)																	!
Channel Inspection	Pickup Truck Conventional (1)																	
Headworks Structure	•																	
Debris Removal	1.5 CY Front End Loader Crawler (1)																	
	16 CY 3 Axle Dump Truck (1)																	!
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																	
	16 CY 3 Axle Dump Truck (3)																	!
	Pickup Truck Conventional (2)																	
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																	
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)																	
Buildings																		
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)																	
	Pickup Truck Conventional (2)																	
Headworks Structure Operating Equipme																		
Mechanical Hydraulic Equipment Upkeep				ightharpoonup														
Test Operate Gates	Pickup Truck Conventional (1)			$oldsymbol{\perp}$														

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-115. Operation & Maintenance Vibration Level at the Receptor

·			O&M														WH aO	
		Tot	Road	Main Channel and Intake Shelf							н	leadwo	orks St	tructur	e	Bldg	- 1	
Building Damage																		
	Total PPV @ 25'	1.29	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a	0.3	0.08	0.23	n/a	n/a	0.08	n/a
Distance from	the Center of O&M Activity to a Receptor (ft)	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	PPV at the Receptor (in/sec)	0.19	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	0.02	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a
Human Annoyance																		
	Total Lv @ 25'	111	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	86	n/a
Distance from	the Center of O&M Activity to a Receptor (ft)	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
	Distance Divergence (dBA)	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
	Lv at the Receptor (VdB)	67	n/a	64	43	43	52	49	49	52	n/a	55	43	52	n/a	n/a	43	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

## Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)
Source: Google Earth

700

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

# Operational Vibration - Equipment Downstream (Alternatives 1-4, 6)

Table L-116. Operation & Maintenance Vibration and Ground-Borne Vibration

·	The Vibration and Ground-Borne Vibr			Single		Single						
				Equipment		Equipment	Add to Single					
			Number of	PPV at 25 ft	Total PPV at	Lv at 25 ft	Source Level	Total Lv at		O&M		
Phase	Equipment Description	Lookup Equipment Types	Equipment	(in/sec)	25 ft (in/sec)	(VdB)	(VdB)	25 ft (VdB)	Tot	Road	Main Channel	
O&M Road												
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-				
Main Channel												
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-				
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86				
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-				
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-				
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86				
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-				
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-				
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96				
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-				
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-				
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92				
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-				
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-				
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92				
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-				
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-		Ī		
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96				
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-				
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-				

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

# Operational Vibration - Equipment Downstream (Alternatives 1-4, 6)

#### Table L-117. Operation & Maintenance Vibration Level at the Receptor

<b>Building Damage</b>	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

7000

Tot	O&M Road			ı	Main C	hanne	ı		
0.91	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a
70	70	70	70	70	70	70	70	70	70
0.19	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a
no	n/a	no	no	no	no	no	no	no	n/a
108	n/a	108	86	86	96	92	92	96	n/a
390	390	390	390	390	390	390	390	390	390
35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
72	n/a	72	50	50	60	56	56	60	n/a
no	n/a	no	no	no	no	no	no	no	n/a
72	n/a	72	50	50	60	56	56	60	n/a

## Operational Vibration - Equipment Supplemental Fish Passage West (Alternatives 1, 2, and 5)

Table L-118. Operation & Maintenance Vibration and Ground-Borne Vibration

				Single Equipment		Single Equipment	Add to Single	
			Number of	PPV at 25 ft	Total PPV at	Lv at 25 ft	Source Level	Total Lv at
Phase	Equipment Description	Lookup Equipment Types	Equipment	(in/sec)	25 ft (in/sec)	(VdB)	(VdB)	25 ft (VdB)
O&M Road				(iiiiii)	1 = 0 10 (112000)	(* 3.2)	()	1 = 1 (1 = 7
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-
Main Channel and Intake Shelf	· · · · · · · · · · · · · · · · · · ·				•			,
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Headworks Structure Operating Equipmen								
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

## Operational Vibration - Equipment Supplemental Fish Passage West (Alternatives 1, 2, and 5)

#### Table L-119. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

#### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

1800

Receptors:

Nearest residential receptor (ft)

## Operational Vibration - Equipment Supplemental Fish Passage West (Alternatives 1, 2, and 5)

Table L-118. Operation & Maintenance Vibration and Ground-Borne Vibration

Table L-118. Operation & Maintenan	ce Vibration and Ground-Borne Vibra	ati(	1	L												
Phase	Equipment Description	Tot	O&M Road	Main Channel and Intake Shelf							Headworks Structure					
O&M Road																
Levee O&M Road Regrading	12' Blade Grader (1)															
Main Channel and Intake Shelf																
Debris Removal	1.5 CY Front End Loader Crawler (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (1)															
Vegetation Removal	56 HP Tractor Rotary Mower (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (1)															
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1) 16 CY 3 Axle Dump Truck (3) Pickup Truck Conventional (2)															
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1) 16 CY 3 Axle Dump Truck (2) Pickup Truck Conventional (1)															
Rock Replacement (Major Repair)	17 TN Crane Crawler (1) 16 CY 3 Axle Dump Truck (2) Pickup Truck Conventional (1)															
Channel Repairs	0.75 CY Hydraulic Excavator (1) 16 CY 3 Axle Dump Truck (3) Pickup Truck Conventional (2)															
Channel Inspection	Pickup Truck Conventional (1)															
Headworks Structure																
Debris Removal	1.5 CY Front End Loader Crawler (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (1)															
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1) 16 CY 3 Axle Dump Truck (3) Pickup Truck Conventional (2)															
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)															
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)															<u> </u>
Headworks Structure Operating Equipmen																
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)															
Test Operate Gates	Pickup Truck Conventional (1)															

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-119. Operation & Maintenance Vibration Level at the Receptor

-																	HW
			O&M												ļ	Op	
		Tot	Road	Main Channel and Intake Shelf							H	leadwo	orks St	tructu	e	Eq	
<b>Building Damage</b>																	
	Total PPV @ 25'	1.22	n/a	0.91	0.91   0.08   0.08   0.23   0.15   0.15   0.23   n/a									0.23	n/a	n/a	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	PPV at the Receptor (in/sec)	0.18	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	n/a
<b>Human Annoyance</b>																	
	Total Lv @ 25'	110	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	470	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
	Distance Divergence (dBA)	38.2	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
	Lv at the Receptor (VdB)	72	n/a	72	50	50	60	56	56	60	n/a	62	50	60	n/a	n/a	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

1800

Table L-120. Operation & Maintenance Vibration and Ground-Borne Vibration

			Number of	Single Equipment PPV at 25 ft	Total PPV at	Single Equipment Lv at 25 ft	Add to Single Source Level	Total Lv at
Phase	Equipment Description	Lookup Equipment Types	Equipment	(in/sec)	25 ft (in/sec)	(VdB)	(VdB)	25 ft (VdB)
O&M Road								_
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-
Main Channel and Intake Shelf								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Headworks Structure								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Headworks Structure Operating Equipment					•			
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

## Table L-121. Operation & Maintenance Vibration Level at the Receptor

<b>Building Damage</b>	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

8600

Source: Google Earth

Table L-120. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Tot	O&M Road								Headw	orks S	tructur	e	HW Op Eq
O&M Road															
Levee O&M Road Regrading	12' Blade Grader (1)														
Main Channel and Intake Shelf															
Debris Removal	1.5 CY Front End Loader Crawler (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (1)														
Vegetation Removal	56 HP Tractor Rotary Mower (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (1)														
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1) 16 CY 3 Axle Dump Truck (3) Pickup Truck Conventional (2)														
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1) 16 CY 3 Axle Dump Truck (2) Pickup Truck Conventional (1)														
Rock Replacement (Major Repair)	17 TN Crane Crawler (1) 16 CY 3 Axle Dump Truck (2) Pickup Truck Conventional (1)														
Channel Repairs	0.75 CY Hydraulic Excavator (1) 16 CY 3 Axle Dump Truck (3) Pickup Truck Conventional (2)														
Channel Inspection	Pickup Truck Conventional (1)														
Headworks Structure															
Debris Removal	1.5 CY Front End Loader Crawler (1) 16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (1)														
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1) 16 CY 3 Axle Dump Truck (3) Pickup Truck Conventional (2)														
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)														
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)														
Headworks Structure Operating Equipmen															
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)										T				
Test Operate Gates	Pickup Truck Conventional (1)									_	+	1		$\overline{}$	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

Table L-121. Operation & Maintenance Vibration Level at the Receptor

-																	HW
			O&M												ļ	Op	
		Tot	Road	Main Channel and Intake Shelf							H	leadwo	orks St	tructu	e	Eq	
<b>Building Damage</b>																	
	Total PPV @ 25'	1.22	n/a	0.91	0.91   0.08   0.08   0.23   0.15   0.15   0.23   n/a									0.23	n/a	n/a	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	PPV at the Receptor (in/sec)	0.18	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.06	0.02	0.05	n/a	n/a	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	n/a
<b>Human Annoyance</b>																	
	Total Lv @ 25'	110	n/a	108	86	86	96	92	92	96	n/a	98	86	96	n/a	n/a	n/a
	Distance from the Center of O&M Activity to a Receptor (ft)	470	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
	Distance Divergence (dBA)	38.2	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
	Lv at the Receptor (VdB)	72	n/a	72	50	50	60	56	56	60	n/a	62	50	60	n/a	n/a	n/a
	Impact to Receptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	n/a	n/a	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

8600

Source: Google Earth

# Operational Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)

Table L-122. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at 25 ft (VdB)	Tot	O&M Road	Agricultural (	Channel a	and Inta	Bri ake 6	dç
O&M Road	Art are the	The state of the s	1 4-7	( 2222)			( = )	,							
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-							
Agricultural Channel and Intake															
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-							
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86							
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-							
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-							
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86							
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-							
Clearing and Grubbing	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-							
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96							
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-							
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-							
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96							
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-							
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-							
Bridge	•	-								<del>-</del>					
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-							
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86							
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-							
Bridge Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-							
Bridge Inspection	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-							

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

# Operational Vibration - Equipment Agricultural Crossing 1 (Alternatives 1-6)

Table L-123. Operation & Maintenance Vibration Level at the Receptor

<b>Building Damage</b>	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

8000

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)

Source: Google Earth

	O&M							Bridg
Tot	Road	Ag	ricultu	ral Cha	annel a	nd Inta	ake	е
0.68	n/a	0.61	0.08	0.08	0.23	0.23	n/a	0.08
60	60	60	60	60	60	60	60	60
0.18	n/a	0.16	0.02	0.02	0.06	0.06	n/a	0.02
no	n/a	no	no	no	no	no	n/a	no
105	n/a	104	86	86	96	96	n/a	86
320	300	300	300	300	300	300	300	300
33.2	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4
72	n/a	72	54	54	63	63	n/a	54
no	n/a	no	no	no	no	no	n/a	no

## Operational Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-124. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Lookup Equipment Types	Number of Equipment	Single Equipment PPV at 25 ft (in/sec)	Total PPV at 25 ft (in/sec)	Single Equipment Lv at 25 ft (VdB)	Add to Single Source Level (VdB)	Total Lv at	
O&M Road	Equipment Description	Lookup Equipment Types	Lquipinent	(III/Sec)	23 11 (11//360)	(VUB)	(VUB)	23 It (VUB)	
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	_	T -	_	0	T -	-
Main Channel	12 Blade Grader (1)	11/4	<u>'</u>				U	<u> </u>	
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1 1		T -		0	Τ -	-
Dobino Nomovai	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1 1	0.076	0.076	86	0	86	2.00E+04
	Pickup Truck Conventional (1)	n/a	'	-	0.070	-	0	_	2.002101
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1			_	0		_
vegetation removal	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	'1	0.076	0.076	86	0	86	2.00E+04
	Pickup Truck Conventional (1)	n/a	'	0.070	0.070	-	0	_	2.002+04
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	_		_	0	<del> </del>	
dealment Kemovai (Wet Gonditions)	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96	5.99E+04
	Pickup Truck Conventional (2)	n/a	2	0.070	0.220	-	6	30	J.33L+04
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	_		_	0	<del> </del>	
Nock Replacement (Million Repail)	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92	3.99E+04
	Pickup Truck Conventional (1)	n/a	1	0.070	0.102	-	0	32	3.332+04
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1				0	<del>                                     </del>	
Nock Neplacement (Major Nepali)	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92	3.99E+04
	Pickup Truck Conventional (1)	n/a	1	0.070	0.132	00	0	32	3.99L+04
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1		<del>-</del>	-	0	<del>  </del>	-
Charmer Repairs	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96	5.99E+04
	Pickup Truck Conventional (2)	n/a	2	0.076	0.220	00	6	96	5.99E+04
Channel Inspection	Pickup Truck Conventional (1)	n/a	1		-	-	0	-	-
Berm/Levee	Pickup Truck Conventional (1)			-		-	U	_	-
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1 1		ı		0	т —	
beilii/ Levee Repails	· · · · · · · · · · · · · · · · · ·	Loaded Trucks	'	0.076	0.220	-		- 06	5.99E+04
	16 CY 3 Axle Dump Truck (3)		3	0.076	0.228	86	10	96	5.99E+04
Water Control Structure & Culvert	Pickup Truck Conventional (2)	n/a	2	-		-	6		-
	1.5 CY Front End Loader Crawler (1)	n/a	T 4		Ī	I	0	T	
Debris Removal	• • • • • • • • • • • • • • • • • • • •			0.076	0.076	-	0	- 06	2.005.04
	16 CY 3 Axle Dump Truck (1) Pickup Truck Conventional (1)	Loaded Trucks	1	0.076	0.076	86	0	86	2.00E+04
Coding out Domoval (Mat Conditions)		n/a n/a	1	-	<del>-</del>	-	0	-	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)		1	- 0.70	1	-	_	-	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96	5.99E+04
His and Detters Cates Univers	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	-	<u> </u>	-	6	-	-
Buildings  Equipment Building (Major Beneix)	IAC CV 2 Avia Duma Trusk (4)	II and ad Trucks	1 4	0.070	0.070	00	0	00	2.005.04
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86	2.00E+04
Water Cantral Observation Co	Pickup Truck Conventional (2)	n/a	2	-	-	-	6		-
Water Control Structure Operating Equipm		Lete			1			T	
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	-

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

# Operational Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

## Table L-125. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)
Source: Google Earth

2600

# Operational Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (A

Table L-124. Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	Tot	O&N t Road	1		Main (	Chann	ol.			Berm	Water Control St				re &	Blda	Op Eq
O&M Road	Equipment Description	10	LIKUAC	'		wain (	Jnanne	eı			Deriii			Guivei	<u> </u>		ышу	Op Ed
Levee O&M Road Regrading	12' Blade Grader (1)					1	T	Т	Т						Ι			
Main Channel	12 Blade Grader (1)																	
Debris Removal	1.5 CY Front End Loader Crawler (1)					Т	Т	Т	Т				Ι		T	Ι		
Debris Removal	` ,																	
	16 CY 3 Axle Dump Truck (1)																	
Variation Danieral	Pickup Truck Conventional (1)							+										
Vegetation Removal	56 HP Tractor Rotary Mower (1)																	
	16 CY 3 Axle Dump Truck (1)																	
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																	
	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)																	
	16 CY 3 Axle Dump Truck (2)																	
	Pickup Truck Conventional (1)																	
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																	
	16 CY 3 Axle Dump Truck (2)																	
	Pickup Truck Conventional (1)																	
Channel Repairs	0.75 CY Hydraulic Excavator (1)																	
	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Channel Inspection	Pickup Truck Conventional (1)																	
Berm/Levee			·															
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)																	
	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Water Control Structure & Culvert				•		_			•	•								
Debris Removal	1.5 CY Front End Loader Crawler (1)																	
	16 CY 3 Axle Dump Truck (1)																	
	Pickup Truck Conventional (1)																	
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																	
,	16 CY 3 Axle Dump Truck (3)																	
	Pickup Truck Conventional (2)																	
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																	
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)			†														
Buildings	· · · · · · · · · · · · · · · · · · ·						<u>'</u>											
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)																	
(	Pickup Truck Conventional (2)																	1
Water Control Structure Operating Equipm																		
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)																	
Test Operate Gates	Pickup Truck Conventional (1)			+		+			1									
1001 Operate Outes	i lokap Haok Collychiloliai (1)												1					

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

# Operational Vibration - Equipment Northern Water Control Structure and Sturgeon Bypass Channel (A

Table L-125. Operation & Maintenance Vibration Level at the Receptor

			O&M Road								Berm	Wat	ter Coi	ntrol S Culver		re &	Bldg	Op Eq	
Building Damage																			
Total PPV @	25' 1	1.52	n/a	0.91	0.91   0.08   0.08   0.23   0.15   0.15   0.23   n/a   0.09   0.0								0.3	0.08	0.23	n/a	n/a	0.076	n/a
Distance from the Center of O&M Activity to a Receptor	r (ft)	100	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
PPV at the Receptor (in/	sec) (	0.19	n/a	0.19	0.19 0.02 0.02 0.05 0.03 0.03 0.05 n/a				n/a	0.05	0.06	0.02	0.05	n/a	n/a	0.02	n/a		
Impact to Rece	eptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	no	n/a	n/a	no	n/a
Human Annoyance																			
Total Lv @	25'	112	n/a	108	86	86	96	92	92	96	n/a	96	98	86	96	n/a	n/a	86	n/a
Distance from the Center of O&M Activity to a Receptor	r (ft)	540	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
Distance Divergence (c	BA) 4	40.0	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
Lv at the Receptor (\	/dB)	72	n/a	72	50	50	60	56	56	60	n/a	60	62	50	60	n/a	n/a	50	n/a
Impact to Rece	eptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)
Source: Google Earth

2600

## Operational Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

Table L-126. Operation & Maintenance Vibration and Ground-Borne Vibration

				Single Equipment		Single Equipment	Add to Single		
			Number of	PPV at 25 ft	Total PPV at	Lv at 25 ft	Source Level	Total Lv at	
Phase	Equipment Description	Lookup Equipment Types	Equipment	(in/sec)	25 ft (in/sec)	(VdB)	(VdB)	25 ft (VdB)	
O&M Road	· · ·			,			, ,		
Levee O&M Road Regrading	12' Blade Grader (1)	n/a	1	-	-	-	0	-	-
Main Channel	· · ·								
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86	2.00E+04
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	- 1
Vegetation Removal	56 HP Tractor Rotary Mower (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86	2.00E+04
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96	5.99E+04
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92	3.99E+04
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	-
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (2)	Loaded Trucks	2	0.076	0.152	86	6	92	3.99E+04
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	-
Channel Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-	-
•	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96	5.99E+04
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Channel Inspection	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	-
Berm/Levee		-							
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96	5.99E+04
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Water Control Structure & Culvert		•							
Debris Removal	1.5 CY Front End Loader Crawler (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86	2.00E+04
	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	-
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)	n/a	1	-	-	-	0	-	-
	16 CY 3 Axle Dump Truck (3)	Loaded Trucks	3	0.076	0.228	86	10	96	5.99E+04
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	- '
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Buildings									
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)	Loaded Trucks	1	0.076	0.076	86	0	86	2.00E+04
	Pickup Truck Conventional (2)	n/a	2	-	-	-	6	-	-
Water Control Structure Operating Equipm									
Mechanical Hydraulic Equipment Upkeep		n/a	2	-	-	-	6	-	-
Test Operate Gates	Pickup Truck Conventional (1)	n/a	1	-	-	-	0	-	-
	id Habitat Dagtaration & Fish Daggara Drai				•			•	

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

<sup>-</sup> Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

## Operational Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (Alternative 4)

## Table L-127. Operation & Maintenance Vibration Level at the Receptor

Building Damage	
	Total PPV @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	PPV at the Receptor (in/sec)
	Impact to Receptor
Human Annoyance	
	Total Lv @ 25'
	Distance from the Center of O&M Activity to a Receptor (ft)
	Distance Divergence (dBA)
	Lv at the Receptor (VdB)
	Impact to Receptor

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)
Source: Google Earth

800

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

## **Operational Vibration - Equipment** Southern Water Control Structure and Sturgeon Bypass Channel (A

Table L-126 Operation & Maintenance Vibration and Ground-Borne Vibration

Phase	Equipment Description	To	ot R	&M oad	Main Channel			Berm	Water Control Structure & Culvert						Op Eq		
O&M Road							711011111	-		1 1						Bldg	
Levee O&M Road Regrading	12' Blade Grader (1)					I											
Main Channel	,																
Debris Removal	1.5 CY Front End Loader Crawler (1)											Т					
	16 CY 3 Axle Dump Truck (1)																1
	Pickup Truck Conventional (1)																1
Vegetation Removal	56 HP Tractor Rotary Mower (1)																
3	16 CY 3 Axle Dump Truck (1)					i											1
	Pickup Truck Conventional (1)																1
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																
(	16 CY 3 Axle Dump Truck (3)																1
	Pickup Truck Conventional (2)																1
Rock Replacement (Minor Repair)	17 TN Crane Crawler (1)																
(	16 CY 3 Axle Dump Truck (2)																1
	Pickup Truck Conventional (1)																1
Rock Replacement (Major Repair)	17 TN Crane Crawler (1)																
· · · · · · · · · · · · · · · · · · ·	16 CY 3 Axle Dump Truck (2)																1
	Pickup Truck Conventional (1)																1
Channel Repairs	0.75 CY Hydraulic Excavator (1)																
	16 CY 3 Axle Dump Truck (3)																1
	Pickup Truck Conventional (2)																1
Channel Inspection	Pickup Truck Conventional (1)																
Berm/Levee	1 /		_														
Berm/ Levee Repairs	0.75 CY Hydraulic Excavator (1)																
·	16 CY 3 Axle Dump Truck (3)																1
	Pickup Truck Conventional (2)																1
Water Control Structure & Culvert	, ,																
Debris Removal	1.5 CY Front End Loader Crawler (1)																
	16 CY 3 Axle Dump Truck (1)																1
	Pickup Truck Conventional (1)																1
Sediment Removal (Wet Conditions)	0.75 CY Hydraulic Excavator (1)																
	16 CY 3 Axle Dump Truck (3)																1
	Pickup Truck Conventional (2)																1
Hinged Bottom Gates Upkeep	Pickup Truck Conventional (2)																
Gates and Concrete Structure Inspection	Pickup Truck Conventional (2)																
Buildings																	
Equipment Building (Major Repair)	16 CY 3 Axle Dump Truck (1)																
	Pickup Truck Conventional (2)																ı
Water Control Structure Operating Equipn	nent																
Mechanical Hydraulic Equipment Upkeep	Pickup Truck Conventional (2)																
Test Operate Gates	Pickup Truck Conventional (1)																
			_		_												

Source: HDR. 2017. Yolo Bypass Salmonid Habitat Restoration & Fish Passage Project

– Ten Percent Design: Draft Technical Memorandum Operations and Maintenance.

## Operational Vibration - Equipment Southern Water Control Structure and Sturgeon Bypass Channel (A

Table L-127. Operation & Maintenance Vibration Level at the Receptor

			O&M Road	Main Channel						Berm	Water Control Structure & Culvert					Bldg	Op Eq		
Building Damage																			
Total PP\	/ @ 25' <i>'</i>	1.52	n/a	0.91	0.08	0.08	0.23	0.15	0.15	0.23	n/a	0.228	0.3	0.08	0.23	n/a	n/a	0.08	n/a
Distance from the Center of O&M Activity to a Rece	ptor (ft)	100	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
PPV at the Receptor	(in/sec) (	0.19	n/a	0.19	0.02	0.02	0.05	0.03	0.03	0.05	n/a	0.05	0.06	0.02	0.05	n/a	n/a	0.02	n/a
Impact to Ro	eceptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	no	n/a	n/a	no	n/a
Human Annoyance																			
Total L	v @ 25'	112	n/a	108	86	86	96	92	92	96	n/a	96	98	86	96	n/a	n/a	86	n/a
Distance from the Center of O&M Activity to a Rece	ptor (ft)	540	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
Distance Divergence	e (dBA) 4	40.0	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
Lv at the Recepto	r (VdB)	72	n/a	72	50	50	60	56	56	60	n/a	60	62	50	60	n/a	n/a	50	n/a
Impact to Ro	eceptor	no	n/a	no	no	no	no	no	no	no	n/a	no	no	no	no	n/a	n/a	no	n/a

<sup>\*</sup>Distances are the minimum distances that can still achieve vibration levels within the significance thresholds, except when there is a closer receptor.

### Significance Level

Non-engineered timber & masonry building

0.2 in/sec

Human annoyance

72 VdB

Receptors:

Nearest residential receptor (ft)
Source: Google Earth

800

Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project EIS/EIR

Table L-128. Vibration Source Levels for Construction Equipment

	PPV at 25 ft	Approximate
Equipment	(in/sec)	Lv <sup>†</sup> at 25 ft
Pile Driver (impact)	0.644	104
Pile Driver (sonic)	0.17	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall) - in soil	0.008	66
Hydromill (slurry wall) - in rock	0.017	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Federal Transit Administration. 2006. Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. May.

Values for pile drivers are based on the typical vibration source levels.

† RMS velocity in decibels (VdB) re 1 micro-inch/second

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