

# Appendix G

## Noise and Vibration Analysis Supporting Documentation

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FIELD NOISE MEASUREMENT DATA

PROJECT: Upper Santa Ana River Restoration PROJ. # 00096.18

SITE IDENTIFICATION: Area 1 LTI OBSERVER(S): Eric Meskus  
 ADDRESS: 9076 Kennedy St  
 START DATE / TIME: 8/1/18 10:00 END DATE / TIME: 8/3/18 9:05

METEOROLOGICAL CONDITIONS:  
 TEMP: \_\_\_\_\_ °F HUMIDITY: \_\_\_\_\_ %R.H. WIND: CALM LIGHT MODERATE VARIABLE  
 WINDSPEED: \_\_\_\_\_ MPH DIR: N NE E SE S SW W NW STEADY GUSTY  
 SKY: SUNNY CLEAR OVRCAST PRTLY CLOUDY FOG RAIN OTHER: \_\_\_\_\_

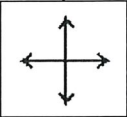
ACOUSTIC MEASUREMENTS:  
 INSTRUMENT: Piccolo #5 TYPE: 1 (2) SERIAL #: 150320016  
 CALIBRATOR: LD CAL 700 SERIAL #: 6645  
 CALIBRATION CHECK: PRE-TEST 94.0 dBA SPL POST-TEST 93.9 dBA SPL WINDSCREEN

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>8.33</sub>	L <sub>1.67</sub>

COMMENTS: - left meter at around 9:30 on 8/1/18  
- must pick up meter by 9:00 on Friday  
- meter location surrounded by various animals (eg, goats, horses)  
- picked up @ 9:05 on 8/3/18

SOURCE INFO AND TRAFFIC COUNTS:  
 PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: \_\_\_\_\_  
 ROADWAY TYPE: \_\_\_\_\_  
 TRAFFIC COUNT DURATION: \_\_\_\_\_ -MIN SPEED #2 COUNT SPEED  
 NB / EB SB / WB NB / EB SB / WB NB / EB SB / WB NB / EB SB / WB  
 AUTOS: \_\_\_\_\_  
 MED. TRUCKS: \_\_\_\_\_  
 HVY TRUCKS: \_\_\_\_\_  
 BUSES: \_\_\_\_\_  
 MOTORCYCLES: \_\_\_\_\_  
 SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER  
 OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
 DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER: \_\_\_\_\_

DESCRIPTION / SKETCH:  
 TERRAIN: HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_  
 PHOTOS: \_\_\_\_\_  
 OTHER COMMENTS / SKETCH:  


## FIELD NOISE MEASUREMENT DATA

PROJECT: Upper Santa Ana River Restoration PROJ. # 00096-18

SITE IDENTIFICATION: <u>Area 2 LT2</u>	OBSERVER(S): <u>Eric Muskus</u>
ADDRESS: <u>7298 Idyllwild Lane</u>	END DATE / TIME: <u>8/3/18 9:30</u>
START DATE / TIME: <u>8/1/18 11:00</u>	

**METEOROLOGICAL CONDITIONS:**

TEMP: _____ °F	HUMIDITY: _____ %R.H.	WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: _____ MPH	DIR: N NE E SE S SW W NW	STEADY GUSTY
SKY: <u>SUNNY CLEAR</u>	OVRCAST: <u>PRTLY CLOUDY</u>	FOG RAIN OTHER: _____

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: Rion NL-22 TYPE: 1 (2) SERIAL #: 3232  
 CALIBRATOR: LD CAL 200 SERIAL #: 6045  
 CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 113.9 dBA SPL WINDSCREEN

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>8.33</sub>	L <sub>1.67</sub>
<u>A12-6002</u>											

COMMENTS: - left meter out around 10:30 on 8/1/18  
- meter was blown over by wind and fixed at around 15:00 on 8/1/18  
- picked up @ 9:30 on 8/3/18

**SOURCE INFO AND TRAFFIC COUNTS:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: \_\_\_\_\_

ROADWAY TYPE: \_\_\_\_\_

TRAFFIC COUNT DURATION:	-MIN		SPEED		#2 COUNT		SPEED	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS:	_____	_____	_____	_____	_____	_____	_____	_____
MED. TRUCKS:	_____	_____	_____	_____	_____	_____	_____	_____
HVY TRUCKS:	_____	_____	_____	_____	_____	_____	_____	_____
BUSES:	_____	_____	_____	_____	_____	_____	_____	_____
MOTORCYCLES:	_____	_____	_____	_____	_____	_____	_____	_____

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
 DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER: \_\_\_\_\_

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS: \_\_\_\_\_

OTHER COMMENTS / SKETCH:


## FIELD NOISE MEASUREMENT DATA

PROJECT: Upper Santa Ana River Restoration PROJ. # 00096-18

SITE IDENTIFICATION: <u>Area 3 LT3</u>	OBSERVER(S): <u>Eric Muskus</u>
ADDRESS: _____	END DATE / TIME: <u>8/3/18 10:15</u>
START DATE / TIME: <u>8/1/18 12:00</u>	

**METEOROLOGICAL CONDITIONS:**

TEMP: _____ °F	HUMIDITY: _____ %R.H.	WIND: CALM LIGHT MODERATE VARIABLE	
WINDSPEED: _____ MPH	DIR: N NE E SE S SW W NW	STEADY GUSTY	
SKY: SUNNY CLEAR	OVCST PRTLY CLOUDY FOG	RAIN	OTHER: _____

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: <u>Piccolo #4</u>	TYPE: 1 (2)	SERIAL #: <u>1503200/4</u>
CALIBRATOR: <u>LD CAL 200</u>		SERIAL #: <u>6645</u>
CALIBRATION CHECK: PRE-TEST <u>94.0</u> dBA SPL	POST-TEST <u>93.3</u> dBA SPL	WINDSCREEN <input checked="" type="checkbox"/>

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>8.33</sub>	L <sub>1.67</sub>

COMMENTS: - left meter around 11:30 on 8/1/18  
- picked up @ 10:15 on 8/3/18

**SOURCE INFO AND TRAFFIC COUNTS:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: \_\_\_\_\_

ROADWAY TYPE: \_\_\_\_\_

TRAFFIC COUNT DURATION:	-MIN		SPEED		#2 COUNT		SPEED	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

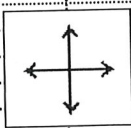
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
 DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER: \_\_\_\_\_

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS: \_\_\_\_\_

OTHER COMMENTS / SKETCH:

## FIELD NOISE MEASUREMENT DATA

PROJECT: Upper Santa Ana River Restoration PROJ. # 00096.18

SITE IDENTIFICATION: <u>Area 4 ST1</u>	OBSERVER(S): <u>Eric Maskus</u>
ADDRESS: _____	END DATE / TIME: <u>8/1/18 13:20</u>
START DATE / TIME: <u>8/1/18 13:05</u>	

**METEOROLOGICAL CONDITIONS:**

TEMP: 102 °F      HUMIDITY: 29 %R.H.      WIND: CALM LIGHT MODERATE VARIABLE

WINDSPEED: 0-5 MPH      DIR: N NE E SE S SW W NW      STEADY GUSTY

SKY: SUNNY CLEAR      OVRCAST PRTLY CLOUDY FOG RAIN      OTHER: \_\_\_\_\_

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: LD 831      TYPE: (1) 2      SERIAL #: 0003786

CALIBRATOR: LD CAL 200      SERIAL #: 6645

CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL      POST-TEST 114.05 dBA SPL      WINDSCREEN

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI      OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>99</sub>	L <sub>1</sub>
<u>623</u>	<u>13:05</u>	<u>13:20</u>	<u>50.8</u>	<u>66.6</u>	<u>36.5</u>	<u>38.0</u>	<u>42.3</u>	<u>48.0</u>	<u>54.6</u>	<u>36.7</u>	<u>62.7</u>

COMMENTS: \_\_\_\_\_

**SOURCE INFO AND TRAFFIC COUNTS:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: \_\_\_\_\_

ROADWAY TYPE: \_\_\_\_\_

	-MIN		SPEED		#2 COUNT		SPEED	
	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

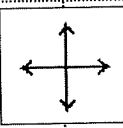
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER: \_\_\_\_\_

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS: \_\_\_\_\_

OTHER COMMENTS / SKETCH:

33.970998, -117.434467

**FIELD NOISE MEASUREMENT DATA**

PROJECT: Upper Santa Ana River Restoration PROJ. # 00096-18

SITE IDENTIFICATION: <u>Area 5 LT4</u>	OBSERVER(S): <u>Eric Moshus</u>
ADDRESS: <u>5345 Grassy Trail Drive</u>	END DATE / TIME: <u>8/3/18 9:55</u>
START DATE / TIME: <u>8/1/18 12:00</u>	

**METEOROLOGICAL CONDITIONS:**

TEMP: _____ °F	HUMIDITY: _____ %R.H.	WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: _____ MPH	DIR: N NE E SE S SW W NW	STEADY GUSTY
SKY: SUNNY CLEAR	OVRCAST PRTLY CLOUDY FOG	RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: <u>Rion NL-21</u>	TYPE: 1 (2)	SERIAL #: <u>60887</u>
CALIBRATOR: <u>LD CAI 200</u>		SERIAL #: <u>1645</u>
CALIBRATION CHECK: PRE-TEST <u>114.0</u> dBA SPL	POST-TEST <u>113.9</u> dBA SPL	WINDSCREEN <input checked="" type="checkbox"/>

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>8.33</sub>	L <sub>1.67</sub>
<u>A42-6003</u>											

COMMENTS: -left meter around 12:00 on 8/1/18  
-picked up meter @ 9:55 on 8/3/18

**SOURCE INFO AND TRAFFIC COUNTS:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: \_\_\_\_\_

ROADWAY TYPE: \_\_\_\_\_

TRAFFIC COUNT DURATION:	-MIN		SPEED		#2 COUNT		SPEED	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
 DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS: \_\_\_\_\_

OTHER COMMENTS / SKETCH:


### FIELD NOISE MEASUREMENT DATA

PROJECT: Upper Santa Ana River Restoration PROJ.# 00096.18

SITE IDENTIFICATION: <u>Old Farm</u>	OBSERVER(S): <u>Eric Maskus</u>
ADDRESS: _____	END DATE / TIME: <u>8/1/18 11:58</u>
START DATE / TIME: <u>8/1/18 11:43</u>	

**METEOROLOGICAL CONDITIONS:**

TEMP: 93 °F HUMIDITY: 28 %R.H. WIND: CALM LIGHT MODERATE VARIABLE  
 WINDSPEED: 0-7 MPH DIR: N NE E SE S SW NW STEADY GUSTY  
 SKY: SUNNY CLEAR OVRCAST PRTLY CLOUDY FOG RAIN OTHER:

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: LD 831 TYPE: 1 SERIAL #: 0003786  
 CALIBRATOR: LD CAL 200 SERIAL #: 66643  
 CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 113.80 dBA SPL WINDSCREEN

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>99</sub>	L <sub>1</sub>
<u>.621</u>	<u>11:43</u>	<u>11:58</u>	<u>41.8</u>	<u>52.2</u>	<u>32.1</u>	<u>34.4</u>	<u>38.8</u>	<u>41.7</u>	<u>45.6</u>	<u>33.2</u>	<u>50.5</u>

COMMENTS: - frequent aircraft flyovers

**SOURCE INFO AND TRAFFIC COUNTS:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: \_\_\_\_\_

ROADWAY TYPE: \_\_\_\_\_

TRAFFIC COUNT DURATION:	-MIN		SPEED		#2 COUNT		SPEED	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
 DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER: \_\_\_\_\_

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS: \_\_\_\_\_

OTHER COMMENTS / SKETCH:


33.968326, -117.413044



**FIELD NOISE MEASUREMENT DATA**

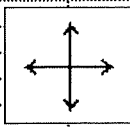
PROJECT: Upper Santa Ana River Restoration PROJ. # 00096.18

SITE IDENTIFICATION: <u>Anza Creek</u>	OBSERVER(S): <u>Eric Markus</u>
ADDRESS: _____	END DATE / TIME: <u>8/1/18 12:39</u>
START DATE / TIME: <u>8/1/18 12:24</u>	

<b>METEROLOGICAL CONDITIONS:</b>			
TEMP: <u>96</u> °F	HUMIDITY: <u>52</u> %R.H.	WIND: CALM <u>LIGHT</u> MODERATE VARIABLE	
WINDSPEED: <u>0-5</u> MPH	DIR: N NE E SE S SW W NW	STEADY GUSTY	
SKY: <u>SUNNY CLEAR</u>	OVRCAST PRTLY CLOUDY FOG RAIN	OTHER: _____	

<b>ACOUSTIC MEASUREMENTS:</b>											
INSTRUMENT: <u>LD 831</u> TYPE: <u>12</u>						SERIAL #: <u>0003786</u>					
CALIBRATOR: <u>LD CAL 200</u>						SERIAL #: <u>6645</u>					
CALIBRATION CHECK: PRE-TEST <u>114.0</u> dBA SPL POST-TEST <u>113.97</u> dBA SPL						WINDSCREEN <u>✓</u>					
SETTINGS: <u>A-WEIGHTED</u> <u>SLOW</u> FAST FRONTAL <u>RANDOM</u> <u>ANSI</u> OTHER: _____											
REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>99</sub>	L <sub>1</sub>
<u>1622</u>	<u>12:24</u>	<u>12:39</u>	<u>45.1</u>	<u>57.0</u>	<u>36.9</u>	<u>39.5</u>	<u>41.9</u>	<u>44.6</u>	<u>49.0</u>	<u>48.2</u>	<u>47.97</u>
COMMENTS: <u>- occasional aircraft flyovers</u>											

<b>SOURCE INFO AND TRAFFIC COUNTS:</b>											
PRIMARY NOISE SOURCE: TRAFFIC <u>AIRCRAFT</u> RAIL INDUSTRIAL <u>AMBIENT</u> OTHER: _____											
ROADWAY TYPE: _____											
TRAFFIC COUNT DURATION: _____ -MIN SPEED				#2 COUNT				SPEED			
	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB	
AUTOS:											
MED. TRUCKS:											
HVY TRUCKS:											
BUSES:											
MOTORCYCLES:											
SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER											
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER: _____											

<b>DESCRIPTION / SKETCH:</b>											
TERRAIN: HARD SOFT <u>MIXED</u> FLAT OTHER: _____											
PHOTOS: _____											
OTHER COMMENTS / SKETCH:											
											

33.964031, -117.427869

### FIELD NOISE MEASUREMENT DATA

PROJECT: Upper Santa Ana River Restoration PROJ. # 00096-18

SITE IDENTIFICATION: <u>Hole Creek Lower</u>	OBSERVER(S): <u>Eric Mastus</u>
ADDRESS: _____	END DATE / TIME: <u>8/1/18 13:58</u>
START DATE / TIME: <u>8/1/18 13:43</u>	

**METEROLOGICAL CONDITIONS:**

TEMP: <u>98</u> °F	HUMIDITY: <u>26</u> %R.H.	WIND: <u>CALM</u> LIGHT MODERATE VARIABLE
WINDSPEED: <u>0-2</u> MPH	DIR: <u>N NE E SE S SW W NW</u>	STEADY GUSTY
SKY: <u>SUNNY CLEAR</u>	OVRCAST: <u>PRTLY CLOUDY</u>	FOG RAIN OTHER: _____

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: LD 831 TYPE: (1) 2 SERIAL #: 0003786  
 CALIBRATOR: LD CAL 200 SERIAL #: 6645  
 CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 113.90 dBA SPL WINDSCREEN 1

SETTINGS: (A-WEIGHTED) (SLOW) FAST FRONTAL (RANDOM) (ANSI) OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>99</sub>	L <sub>1</sub>
<u>.624</u>	<u>13:43</u>	<u>13:58</u>	<u>47.7</u>	<u>61.5</u>	<u>41.1</u>	<u>43.2</u>	<u>45.4</u>	<u>47.1</u>	<u>48.9</u>	<u>41.8</u>	<u>57.6</u>

COMMENTS: traffic noise is somewhat audible; aircraft flyovers

**SOURCE INFO AND TRAFFIC COUNTS:**

PRIMARY NOISE SOURCE: (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL (AMBIENT) OTHER: \_\_\_\_\_

ROADWAY TYPE: \_\_\_\_\_

	-MIN		SPEED		#2 COUNT		SPEED	
	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

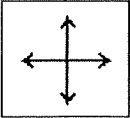
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
 DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER: \_\_\_\_\_

**DESCRIPTION / SKETCH:**

TERRAIN: HARD (SOFT) MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS: \_\_\_\_\_

OTHER COMMENTS / SKETCH:



33.959391, -117.464289

### FIELD NOISE MEASUREMENT DATA

PROJECT: Upper Santa Ana River Restoration PROJ.# 00096.18

SITE IDENTIFICATION: <u>Hidden Valley Wetlands</u>	OBSERVER(S): <u>Eric Mustus</u>
ADDRESS: _____	END DATE / TIME: <u>8/1/18 14:37</u>
START DATE / TIME: <u>8/1/18 14:22</u>	

**METEOROLOGICAL CONDITIONS:**

TEMP: 102 °F      HUMIDITY: 23 %R.H.      WIND: CALM LIGHT MODERATE VARIABLE  
 WINDSPEED: 0-7 MPH      DIR: N NE E SE S SW W NW      STEADY GUSTY  
 SKY: SUNNY CLEAR      OVR CST PRTLY CLOUDY FOG RAIN      OTHER:

**ACOUSTIC MEASUREMENTS:**

INSTRUMENT: LD 831      TYPE: 2      SERIAL #: 0003786  
 CALIBRATOR: LD CAL 200      SERIAL #: 6645  
 CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL      POST-TEST 113.93 dBA SPL      WINDSCREEN   
 SETTINGS: A-WEIGHTED SLOW FAST      FRONTAL RANDOM ANSI      OTHER: \_\_\_\_\_

REC #	START	END	L <sub>eq</sub>	L <sub>max</sub>	L <sub>min</sub>	L <sub>90</sub>	L <sub>50</sub>	L <sub>25</sub>	L <sub>10</sub>	L <sub>99</sub> <del>L<sub>95</sub></del>	L <sub>1</sub> <del>L<sub>5</sub></del>
<u>625</u>	<u>14:22</u>	<u>14:37</u>	<u>49.3</u>	<u>60.2</u>	<u>35.0</u>	<u>39.6</u>	<u>47.3</u>	<u>50.7</u>	<u>52.9</u>	<u>36.2</u>	<u>57.2</u>

COMMENTS: -wind speeds picked up considerably as measurement went on  
-distant aircraft flyovers

**SOURCE INFO AND TRAFFIC COUNTS:**

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER: \_\_\_\_\_

ROADWAY TYPE: \_\_\_\_\_  
 TRAFFIC COUNT DURATION: \_\_\_\_\_ -MIN      SPEED      #2 COUNT      SPEED  
                         NB / EB      SB / WB      NB / EB      SB / WB      NB / EB      SB / WB      NB / EB      SB / WB  
 AUTOS: \_\_\_\_\_  
 MED. TRUCKS: \_\_\_\_\_  
 HVY TRUCKS: \_\_\_\_\_  
 BUSES: \_\_\_\_\_  
 MOTORCYCLES: \_\_\_\_\_

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

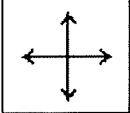
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL  
 DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

**DESCRIPTION / SKETCH:**

TERRAIN: HARD SOFT MIXED FLAT OTHER: \_\_\_\_\_

PHOTOS: \_\_\_\_\_

OTHER COMMENTS / SKETCH:



33.963268, -117.476605

**Table 1. Construction Noise Source Levels - Mobilization Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
62	Truck, Flat Bed	74.3	0.25	1	50	Soft	0	68	74
61	Truck, Dump	76.5	0.125	2	50	Soft	0	70	77
29	Loader (Front End Loader)	79.1	0.25	1	50	Soft	0	73	79
13	Dozer	81.7	0.25	1	50	Soft	0	76	82
<b>Combined Equipment</b>								<b>79</b>	<b>82</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 2. Construction Noise Source Levels - Clearing & Grubbing Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
47	Saw, Chain	83.7	0.75	2	50	Soft	0	85	84
70	ATV (Based on CA Off-Highwa	62.3	0.25	1	50	Soft	0	56	62
18	Excavator	80.7	0.5	1	50	Soft	0	78	81
61	Truck, Dump	76.5	0.5	1	50	Soft	0	73	77
<b>Combined Equipment</b>								<b>86</b>	<b>84</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 3. Construction Noise Source Levels - Invasive Plant Removal Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
47	Saw, Chain	83.7	0.25	1	50	Soft	0	78	84
70	ATV (Based on CA Off-Highwa	62.3	0.125	1	50	Soft	0	53	62
18	Excavator	80.7	0.75	1	50	Soft	0	79	81
61	Truck, Dump	76.5	0.25	1	50	Soft	0	70	77
<b>Combined Equipment</b>								<b>82</b>	<b>84</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 4. Construction Noise Source Levels - Channel and Floodplain Earthwork Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
61	Truck, Dump	76.5	1	1	50	Soft	0	77	77
18	Excavator	80.7	1	2	50	Soft	0	84	81
13	Dozer	81.7	0.25	1	50	Soft	0	76	82
29	Loader (Front End Loader)	79.1	0.125	1	50	Soft	0	70	79
71	Water Truck	76.5	0.25	1	50	Soft	0	70	77
<b>Combined Equipment</b>								<b>85</b>	<b>82</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 5. Construction Noise Source Levels - Streambank Erosion Protection Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.75	1	50	Soft	0	75	77
18	Excavator	80.7	1	2	50	Soft	0	84	81
29	Loader (Front End Loader)	79.1	0.125	1	50	Soft	0	70	79
71	Water Truck	76.5	0.25	1	50	Soft	0	70	77
9	Compactor	83.2	0.5	1	50	Soft	0	80	83
	<b>Combined Equipment</b>							<b>86</b>	<b>83</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.





**Table 7. Construction Noise Source Levels - In-Stream Habitat Features Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.5	1	50	Soft	0	73	77
18	Excavator	80.7	1	1	50	Soft	0	81	81
18	Excavator	80.7	0.5	1	50	Soft	0	78	81
29	Loader (Front End Loader)	79.1	0.125	1	50	Soft	0	70	79
71	Water Truck	76.5	0.25	1	50	Soft	0	70	77
70	ATV (Based on CA Off-Highway)	62.315065	0.25	1	50	Soft	0	56	62
<b>Combined Equipment</b>								<b>83</b>	<b>81</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 8. Construction Noise Source Levels - Seeding and Planting Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
62	Truck, Flat Bed	74.3	0.25	2	50	Soft	0	71	74
70	ATV (Based on CA Off-Highwa	62.3	1	2	50	Soft	0	65	62
71	Water Truck	76.5	0.5	1	50	Soft	0	73	77
	<b>Combined Equipment</b>							<b>76</b>	<b>77</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 9. Construction Noise Source Levels - Demobilization Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
62	Truck, Flat Bed	74.3	0.25	2	50	Soft	0	71	74
13	Dozer	81.7	0.25	1	50	Soft	0	76	82
<b>Combined Equipment</b>								<b>77</b>	<b>82</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 10. Construction Noise Source Levels - Well Drilling Phase, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
35	Pile-driver (Impact)	101.3	0.2	1	50	Soft	0	94	101
<b>Combined Equipment</b>								<b>94</b>	<b>101</b>

- Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
- Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 11. Combined Construction Noise Levels Over Time, Tributaries Restoration Project**

Predicted Noise Levels, 8-hour Leq, dBA	Lower Range	Upper Range	Dates when construction noise levels change based on the proposed construction schedule																												
			2019/1/1	2019/1/3	2019/1/4	2019/1/8	2019/1/9	2019/1/13	2019/1/14	2019/1/20	2019/1/21	2019/2/11	2019/2/16	2019/3/1	2019/3/16	2019/3/21	2019/4/1	2019/4/21	2019/4/22	2019/4/24	2019/4/26	2019/5/1									
<b>Receiver 1: Paradise Knolls Golf Course</b>			Without Well Drilling	22.3	49.6	25.1	25.1	34.6	34.6	34.1	34.1	36.0	36.0	33.3	33.3	33.3	33.3	33.3	33.3	36.8	36.8	36.1	36.1	29.8	29.8	22.3	22.3	25.9	25.9	23.4	23.4
			With Well Drilling	22.3	51.3	25.1	34.6	34.1	34.1	36.0	36.0	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.3	36.8	36.8	36.1	36.1	29.8	29.8	22.3	22.3	25.9	25.9	23.4	23.4
<b>Receiver 2: Residential S of Hidden Valley Creek</b>			Without Well Drilling	31.9	67.7	34.8	34.8	44.2	44.2	43.7	43.7	45.7	45.7	42.9	42.9	42.9	42.9	42.9	42.9	46.4	46.4	45.8	45.8	39.4	39.4	31.9	31.9	35.5	35.5	33.0	33.0
			With Well Drilling	31.9	71.2	34.8	34.8	44.2	44.2	43.7	43.7	45.7	45.7	42.9	42.9	42.9	42.9	42.9	42.9	46.4	46.4	45.8	45.8	39.4	39.4	31.9	31.9	35.5	35.5	33.0	33.0
<b>Receiver 3: Residential N of Hidden Valley Creek</b>			Without Well Drilling	30.8	56.2	33.6	33.6	43.1	43.1	42.6	42.6	44.6	44.6	41.8	41.8	41.8	41.8	41.8	41.8	45.3	45.3	44.7	44.7	38.3	38.3	30.8	30.8	34.4	34.4	31.9	31.9
			With Well Drilling	30.8	62.2	33.6	33.6	43.1	43.1	42.6	42.6	44.6	44.6	41.8	41.8	41.8	41.8	41.8	41.8	45.3	45.3	44.7	44.7	38.3	38.3	30.8	30.8	34.4	34.4	31.9	31.9
<b>Receiver 4: Rutland Park</b>			Without Well Drilling	28.9	56.7	45.0	45.0	54.5	54.5	54.0	54.0	55.9	55.9	53.2	53.2	53.2	53.2	53.2	53.2	56.7	56.7	56.0	56.0	49.7	49.7	42.2	42.2	45.8	45.8	43.3	43.3
			With Well Drilling	28.9	56.7	45.0	45.0	54.5	54.5	54.0	54.0	55.9	55.9	53.2	53.2	53.2	53.2	53.2	53.2	56.7	56.7	56.0	56.0	49.7	49.7	42.2	42.2	45.8	45.8	43.3	43.3
<b>Receiver 5: Residential west of Lower Hole Creek</b>			Without Well Drilling	25.5	73.9	62.2	62.2	71.7	71.7	71.1	71.1	73.1	73.1	70.4	70.4	70.4	70.4	70.4	70.4	73.9	73.9	73.2	73.2	73.2	73.2	66.9	66.9	59.4	59.4	63.0	63.0
			With Well Drilling	25.5	73.9	62.2	62.2	71.7	71.7	71.1	71.1	73.1	73.1	70.4	70.4	70.4	70.4	70.4	70.4	73.9	73.9	73.2	73.2	73.2	73.2	66.9	66.9	59.4	59.4	63.0	63.0
<b>Receiver 6: Van Buren Golf Center</b>			Without Well Drilling	18.2	55.4	43.7	43.7	53.2	53.2	52.7	52.7	54.7	54.7	51.9	51.9	52.0	52.0	52.0	52.0	55.4	55.4	54.8	54.8	48.5	48.5	29.7	29.7	41.2	41.2	44.6	44.6
			With Well Drilling	18.2	55.4	43.7	43.7	53.2	53.2	52.7	52.7	54.7	54.7	51.9	51.9	52.0	52.0	52.0	52.0	55.4	55.4	54.8	54.8	48.5	48.5	29.7	29.7	41.2	41.2	44.6	44.6
<b>Receiver 7: Jurupa Hills Country Club/ Residential N of Anza Creek</b>			Without Well Drilling	36.3	54.9	39.2	39.2	48.7	48.7	48.1	48.1	48.2	48.2	48.1	48.1	50.5	50.1	47.4	47.4	48.7	48.0	48.7	47.9	48.7	48.0	48.6	47.8	48.6	47.8	48.6	47.8
			With Well Drilling	36.3	54.9	39.2	39.2	48.7	48.7	48.1	48.1	48.2	48.2	48.1	48.1	50.5	50.1	47.4	47.4	48.7	48.0	48.7	47.9	48.7	48.0	48.6	47.8	48.6	47.8	48.6	47.8
<b>Receiver 8: Martha McLean-Anza Narrows Regional Park</b>			Without Well Drilling	44.1	73.4	46.9	46.9	56.4	56.4	55.9	55.9	55.9	55.9	55.9	55.9	57.9	57.8	55.1	55.1	55.8	55.6	55.8	55.6	55.8	55.7	55.8	55.6	55.8	55.6	55.8	55.6
			With Well Drilling	44.1	73.4	46.9	46.9	56.4	56.4	55.9	55.9	55.9	55.9	55.9	55.9	57.9	57.8	55.1	55.1	55.8	55.6	55.8	55.6	55.8	55.7	55.8	55.6	55.8	55.6	55.8	55.6
<b>Receiver 9: Residential S of Anza Creek</b>			Without Well Drilling	39.0	65.7	41.8	41.8	51.3	51.3	50.8	50.8	50.8	50.8	50.8	50.8	53.3	52.8	50.0	50.0	51.4	50.5	51.4	50.5	51.5	50.6	51.4	50.5	51.4	50.5	51.4	50.5
			With Well Drilling	39.0	65.7	41.8	41.8	51.3	51.3	50.8	50.8	50.8	50.8	50.8	50.8	53.3	52.8	50.0	50.0	51.4	50.5	51.4	50.5	51.5	50.6	51.4	50.5	51.4	50.5	51.4	50.5
<b>Receiver 10: Rancho Jurupa Park</b>			Without Well Drilling	27.5	45.4	34.5	34.5	44.0	44.0	43.4	43.4	43.4	43.4	43.4	43.4	49.8	45.4	42.7	42.7	49.1	43.2	49.1	43.2	49.3	44.1	49.1	43.2	49.1	43.2	49.1	43.2
			With Well Drilling	27.5	49.8	34.5	34.5	44.0	44.0	43.4	43.4	43.4	43.4	43.4	43.4	49.8	45.4	42.7	42.7	49.1	43.2	49.1	43.2	49.3	44.1	49.1	43.2	49.1	43.2	49.1	43.2
<b>Receiver 11: Residential South of Old Ranch Creek</b>			Without Well Drilling	29.0	69.5	58.6	58.6	68.1	68.1	67.6	67.6	67.6	67.6	67.6	67.6	70.3	69.5	66.8	66.8	69.4	68.4	69.4	68.4	68.6	67.3	68.6	67.3	68.6	67.3	68.6	67.3
			With Well Drilling	29.0	70.3	58.6	58.6	68.1	68.1	67.6	67.6	67.6	67.6	67.6	67.6	70.3	69.5	66.8	66.8	69.4	68.4	69.4	68.4	68.6	67.3	68.6	67.3	68.6	67.3	68.6	67.3

**Notes:**

All noise levels are 8-hour Leq, dBA

Cells without values indicate dates without nearby construction activity

Highlighted cells indicate dates when construction noise levels change for the indicated construction activity category

59.4	59.4	47.7	47.7	39.9	39.9	21.8	21.8	33.0	31.7	45.3	56.7	38.7	2019/7/7
56.9	56.9	45.2	45.2	37.4	37.4	19.3	19.3	42.5	41.2	54.8	66.2	48.1	2019/7/8
29.0	29.0	61.7	61.7	43.2	43.2	28.5	28.5	42.0	40.7	54.3	65.7	47.6	2019/7/10
38.4	38.4	71.2	71.2	52.7	52.7	38.0	38.0	42.1	40.7	54.3	65.7	47.6	2020/1/1
37.9	37.9	70.7	70.7	52.2	52.2	37.5	37.5	41.9	40.7	54.3	65.7	47.6	2020/1/3
39.9	39.9	72.7	72.7	54.1	54.1	38.1	38.1	42.2	40.7	54.3	65.7	47.6	2020/1/4
37.2	37.2	69.9	69.9	51.4	51.4	37.3	37.3	42.2	40.7	54.3	65.7	47.6	2020/1/9
40.7	40.7	73.4	73.4	54.9	54.9	38.3	38.3	42.2	40.7	54.3	65.7	47.6	2020/1/10
40.7	40.7	73.4	73.4	54.9	54.9	44.4	39.7	49.4	48.2	62.2	71.2	51.3	2020/1/21
40.7	40.7	73.4	73.4	54.9	54.9	43.9	37.9	48.8	47.6	61.7	70.2	49.6	2020/1/22
40.7	40.7	73.4	73.4	54.9	54.9	43.6	37.0	48.6	47.4	61.5	69.8	46.8	2020/1/23
40.7	40.7	73.4	73.4	54.9	54.9	43.8	37.7	48.8	47.5	61.6	70.1	48.9	2020/1/25
36.0	36.0	68.7	68.7	50.2	50.2	43.5	36.2	48.7	47.5	61.6	70.1	49.5	2020/2/1
34.3	34.3	67.1	67.1	48.6	48.6	43.7	37.1	48.9	47.8	61.7	70.2	49.5	2020/2/26
35.1	35.1	67.9	67.9	49.4	49.4	43.7	37.2	48.9	47.8	61.7	70.2	49.7	2020/3/1
34.5	34.5	67.3	67.3	48.8	48.8	43.7	37.1	48.9	47.8	61.7	70.2	49.7	2020/3/9
34.5	34.5	67.3	67.3	48.8	48.8	43.3	34.8	48.5	47.4	61.5	69.8	48.9	2020/3/10
33.6	33.6	66.4	66.4	47.9	47.9	43.2	34.7	48.5	47.4	61.5	69.8	48.9	2020/3/11
33.6	33.6	66.4	66.4	47.9	47.9	27.1	27.1	25.5					2020/3/12
33.6	33.6	66.4	66.4	47.9	47.9	29.0	29.0	31.3	28.9	42.5	53.9	35.8	2020/3/16
33.6	33.6	66.4	66.4	47.9	47.9	30.6	30.6	34.2	32.5	46.1	57.5	39.4	2020/4/1
33.6	33.6	66.4	66.4	47.9	47.9	29.4	29.4	32.1	30.0	43.6	55.0	36.9	2020/4/28
33.6	33.6	66.4	66.4	47.9	47.9	29.4	29.4	32.1	30.0	43.6	55.0	36.9	2020/4/29
33.6	33.6	66.4	66.4	47.9	47.9	29.4	29.4	32.1	30.0	43.6	55.0	36.9	2020/4/30

**Rec 1**  
w/o well  
w well  
**Rec 2**  
w/o well  
w well  
**Rec 3**  
w/o well  
w well  
**Rec 4**  
w/o well  
w well  
**Rec 5**  
w/o well  
w well  
**Rec 6**  
w/o well  
w well  
**Rec 7**  
w/o well  
w well  
**Rec 8**  
w/o well  
w well  
**Rec 9**  
w/o well  
w well  
**Rec 10**  
w/o well  
w well  
**Rec 11**  
w/o well  
w well

**Table 19. Construction Vibration Analysis - Potential Building Damage, Mitigation Reserve Program**

Vibration attenuation constant (n):		1.1						
Equipment Item	Reference PPV at 25 feet, in/s <sup>a</sup>	Building Category:	Extremely fragile historic buildings, ruins, ancient monuments	Fragile buildings	Historic and some old buildings	Older residential structures	New residential structures	Modern industrial/commercial buildings
		Vibration Damage Impact Criteria, PPV, in/s:	0.08	0.1	0.25	0.3	0.5	0.5
Large bulldozer <sup>b</sup>	0.089	Distance to Impact Criteria, feet:	28	23	10	9	6	6
Loaded Trucks (on rough terrain)	0.076		24	20	9	8	5	5
Small bulldozer <sup>c</sup>	0.003		2	2	1	1	1	1

<sup>a</sup> Obtained from "Transportation and Construction Vibration Guidance Manual", Caltrans 2013

<sup>b</sup> Considered representative of other heavy earthmoving equipment such as excavators, graders, backhoes, etc.

<sup>c</sup> Considered representative of smaller equipment such as mini excavators.



**Table 20. Construction Vibration Analysis - Potential Building Damage, Mitigation Reserve Program**

Vibration attenuation constant (n):		1.1				
Equipment Item	Reference PPV at 25 feet, in/s <sup>a</sup>	Perceptibility:	Barely perceptible	Distinctly perceptible	Strongly perceptible	Severe
		Vibration Damage Impact Criteria, PPV, in/s:	0.01	0.04	0.1	0.4
Large bulldozer <sup>b</sup>	0.089	Distance to Impact Criteria, feet:	183	52	23	7
Loaded Trucks (on rough terrain)	0.076		159	45	20	6
Small bulldozer <sup>c</sup>	0.003		9	3	2	1

<sup>a</sup> Obtained from "Transportation and Construction Vibration Guidance Manual", Caltrans 2013

<sup>b</sup> Considered representative of other heavy earthmoving equipment such as excavators, graders, backhoes, etc.

<sup>c</sup> Considered representative of smaller equipment such as mini excavators and bobcats.

**Table 12. Construction Vibration Analysis for Tributaries Restoration Project**

Vibration attenuation constant (n):		1.1
Vibration Source Data		
Equipment Item	Reference PPV at 25 feet, in/s <sup>a</sup>	
Hydraulic/impact hammer <sup>b</sup>	0.650	
Large bulldozer <sup>c</sup>	0.089	
Loaded trucks (on rough terrain)	0.076	
Small bulldozer <sup>d</sup>	0.003	

Perceptibility Criteria, PPV, in/sec (continuous/frequent intermittent sources)	
Barely perceptible	0.01
Distinctly perceptible	0.04
Strongly perceptible	0.1
Severe	0.4

<sup>a</sup> Obtained from "Transportation and Construction Vibration Guidance Manual", Caltrans 2013

<sup>b</sup> For well drilling, based on impact pile driving

<sup>c</sup> Considered representative of any full size/large excavator, dozer, backhoe, etc.

<sup>d</sup> Considered representative of any small excavator, dozer, backhoe, skid steer, etc.

Receiver #	Description/Receiver Type	Location (City)	Source	Closest Distance, feet	PPV, in/sec	Human Response
2	Single Family Residential	South of Hidden Valley Creek (Riverside)	Hydraulic/impact hammer	530	0.02259	Barely perceptible
			Large bulldozer	330	0.00521	Below barely perceptible
			Loaded trucks	330	0.00445	Below barely perceptible
			Small bulldozer	330	0.00018	Below barely perceptible
3	Single Family Residential	North of Hidden Valley Creek (Jurupa Valley)	Hydraulic/impact hammer	1080	0.01032	Barely perceptible
			Large bulldozer	1040	0.00147	Below barely perceptible
			Loaded trucks	1040	0.00126	Below barely perceptible
			Small bulldozer	1040	0.00005	Below barely perceptible
5	Single Family Residential	West of Lower Hole Creek (Riverside)	Hydraulic/impact hammer	3580	0.00276	Below barely perceptible
			Large bulldozer	180	0.01015	Barely perceptible
			Loaded trucks	180	0.00866	Below barely perceptible
			Small bulldozer	180	0.00034	Below barely perceptible
7	Single Family Residential	North of Anza Creek (Jurupa Valley)	Hydraulic/impact hammer	7050	0.00131	Below barely perceptible
			Large bulldozer	1270	0.00118	Below barely perceptible
			Loaded trucks	1270	0.00101	Below barely perceptible
			Small bulldozer	1270	0.00004	Below barely perceptible
9	Single Family Residential	South of Anza Creek (Riverside)	Hydraulic/impact hammer	5130	0.00186	Below barely perceptible
			Large bulldozer	440	0.00380	Below barely perceptible
			Loaded trucks	440	0.00324	Below barely perceptible
			Small bulldozer	440	0.00013	Below barely perceptible
11	Single Family Residential	South of Old Ranch Creek (Riverside)	Hydraulic/impact hammer	930	0.01217	Barely perceptible
			Large bulldozer	270	0.00650	Below barely perceptible
			Loaded trucks	270	0.00555	Below barely perceptible
			Small bulldozer	270	0.00022	Below barely perceptible



**Table 14. Project Maintenance Noise Source Levels, Years 3 to 10, Tributaries Restoration Project**

<b>Equipment</b>		<b>Typical Level @ 50', dBA<sup>1</sup></b>	<b>Usage Factor<sup>1,2</sup></b>	<b>Number of Units</b>	<b>Distance to Receiver, ft.</b>	<b>Hard or Soft Site?</b>	<b>Barrier Attenuation, dB</b>	<b>Leq(h), dBA</b>	<b>Lmax, dBA</b>
<b>Item No.</b>	<b>Description</b>								
18	Excavator	80.7	0.375	1	50	Soft	0	76	81
47	Saw, Chain	83.7	0.375	1	50	Soft	0	79	84
70	ATV (Based on CA Off-Highwa	62.3	1	1	50	Soft	0	62	62
72	Hedge Trimmer	56.4	0.375	1	50	Soft	0	52	56
2	Backhoe	77.6	0.375	1	50	Soft	0	73	78
	<i><b>Combined Equipment</b></i>							<b>82</b>	<b>84</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 15. Project Maintenance Noise Source Levels, In Perpetuity, Tributaries Restoration Project**

Equipment		Typical Level @ 50', dBA <sup>1</sup>	Usage Factor <sup>1,2</sup>	Number of Units	Distance to Receiver, ft.	Hard or Soft Site?	Barrier Attenuation, dB	Leq(h), dBA	Lmax, dBA
Item No.	Description								
47	Saw, Chain	83.7	0.375	1	50	Soft	0	79	84
70	ATV (Based on CA Off-Highwa	62.3	1	1	50	Soft	0	62	62
72	Hedge Trimmer	56.4	0.375	1	50	Soft	0	52	56
<b>Combined Equipment</b>								<b>80</b>	<b>84</b>

1. Obtained or estimated from:  
 FHWA Roadway Construction Noise Model (RCNM), Version 1.1, December 8, 2008; and/or  
 "Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use. Based on above-referenced sources or anticipated hours of operation per day.

**Table 16. Project Maintenance Noise Level Analysis, Years 0 to 2, Tributaries Restoration Project**

Receiver #	Description	Noise Level @ 50'	Distance from Restoration Site, Feet				Predicted Noise Levels, L <sub>50</sub> , dBA				Noise Standard, L <sub>50</sub>	Ambient Noise Level	Combined Noise Level Range	Noise Increase Range
			Hidden Valley Creek	Lower Hole Creek	Anza Creek	Old Ranch Creek	Hidden Valley Creek	Lower Hole Creek	Anza Creek	Old Ranch Creek				
1	Paradise Knolls Golf Course	81.9	2,010	7,000	> 2 mi	> 2 mi	41.8	28.3			N/A	49.9	49.9 - 50.5	0 - 0.6
2	Residential S of Hidden Valley Creek	81.9	380	2,880	> 2 mi	> 2 mi	59.9	37.9			55	48.3	48.7 - 60.2	0.4 - 11.9
3	Residential N of Hidden Valley Creek	81.9	1,090	3,190	> 2 mi	> 2 mi	48.5	36.8			N/A	49.9	50.1 - 52.2	0.2 - 2.3
4	Rutland Park	81.9	3,810	1,120	> 2 mi	> 2 mi	34.9	48.2			65	57.2	57.2 - 57.7	0 - 0.5
5	Residential W of Lower Hole Creek	81.9	3,460	230	10,360	> 2 mi	35.9	65.3	24.0		55	57.2	57.2 - 66	0 - 8.8
6	Van Buren Golf Center	81.9	5,720	1,260	8,940	10,220	30.5	46.9	25.6	24.2	65	57.2	57.2 - 57.6	0 - 0.4
7	Jurupa Hills Country Club	81.9	> 2 mi	9,530	1,320	1,930		24.9	46.4	42.3	N/A	47	47 - 49.7	0 - 2.7
8	Martha McLean–Anza Narrows Regional Park	81.9	> 2 mi	9,810	240	940		24.6	64.9	50.1	65	47	47 - 65	0 - 18
9	Residential S of Anza Creek	81.9	> 2 mi	> 2 mi	490	1,500			57.1	45.0	55	47	49.1 - 57.5	2.1 - 10.5
10	Rancho Jurupa Park	81.9	> 2 mi	> 2 mi	5,610	2,950			30.7	37.6	N/A	47	47.1 - 47.5	0.1 - 0.5
11	Residential S of Old Ranch Creek	81.9	> 2 mi	> 2 mi	4,910	320			32.1	61.8	55	47	47.1 - 61.9	0.1 - 14.9

**Table 17. Project Maintenance Noise Level Analysis, Years 3 to 10, Tributaries Restoration Project**

Receiver #	Description	Noise Level @ 50'	Distance from Restoration Site, Feet				Predicted Noise Levels, L <sub>50</sub> , dBA				Noise Standard, L <sub>50</sub> , dBA	Ambient Noise Level, dBA	Combined Noise Level Range, dBA	Noise Increase Range
			Hidden Valley Creek	Lower Hole Creek	Anza Creek	Old Ranch Creek	Hidden Valley Creek	Lower Hole Creek	Anza Creek	Old Ranch Creek				
1	Paradise Knolls Golf Course	81.9	2,010	7,000	> 2 mi	> 2 mi	41.8	28.3			N/A	49.9	49.9 - 50.5	0 - 0.6
2	Residential S of Hidden Valley Creek	81.9	380	2,880	> 2 mi	> 2 mi	59.9	37.9			55	48.3	48.7 - 60.2	0.4 - 11.9
3	Residential N of Hidden Valley Creek	81.9	1,090	3,190	> 2 mi	> 2 mi	48.5	36.8			N/A	49.9	50.1 - 52.2	0.2 - 2.3
4	Rutland Park	81.9	3,810	1,120	> 2 mi	> 2 mi	34.9	48.2			65	57.2	57.2 - 57.7	0 - 0.5
5	Residential W of Lower Hole Creek	81.9	3,460	230	10,360	> 2 mi	35.9	65.3	24.0		55	57.2	57.2 - 66	0 - 8.8
6	Van Buren Golf Center	81.9	5,720	1,260	8,940	10,220	30.5	46.9	25.6	24.2	65	57.2	57.2 - 57.6	0 - 0.4
7	Jurupa Hills Country Club	81.9	> 2 mi	9,530	1,320	1,930		24.9	46.4	42.3	N/A	47	47 - 49.7	0 - 2.7
8	Martha McLean–Anza Narrows Regional Park	81.9	> 2 mi	9,810	240	940		24.6	64.9	50.1	65	47	47 - 65	0 - 18
9	Residential S of Anza Creek	81.9	> 2 mi	> 2 mi	490	1,500			57.1	45.0	55	47	49.1 - 57.5	2.1 - 10.5
10	Rancho Jurupa Park	81.9	> 2 mi	> 2 mi	5,610	2,950			30.7	37.6	N/A	47	47.1 - 47.5	0.1 - 0.5
11	Residential S of Old Ranch Creek	81.9	> 2 mi	> 2 mi	4,910	320			32.1	61.8	55	47	47.1 - 61.9	0.1 - 14.9

**Table 18. Project Maintenance Noise Level Analysis, In Perpetuity, Tributaries Restoration Project**

Receiver #	Description	Noise Level @ 50'	Distance from Restoration Site, Feet				Predicted Noise Levels, L <sub>50</sub> , dBA				Noise Standard, L <sub>50</sub>	Ambient Noise Level	Combined Noise Level Range	Noise Increase Range
			Hidden Valley Creek	Lower Hole Creek	Anza Creek	Old Ranch Creek	Hidden Valley Creek	Lower Hole Creek	Anza Creek	Old Ranch Creek				
1	Paradise Knolls Golf Course	79.5	2,010	7,000	> 2 mi	> 2 mi	39.4	25.9			N/A	49.9	49.9 - 50.3	0 - 0.4
2	Residential S of Hidden Valley Creek	79.5	380	2,880	> 2 mi	> 2 mi	57.5	35.5			55	48.3	48.5 - 58	0.2 - 9.7
3	Residential N of Hidden Valley Creek	79.5	1,090	3,190	> 2 mi	> 2 mi	46.1	34.4			N/A	49.9	50 - 51.4	0.1 - 1.5
4	Rutland Park	79.5	3,810	1,120	> 2 mi	> 2 mi	32.5	45.8			65	57.2	57.2 - 57.5	0 - 0.3
5	Residential W of Lower Hole Creek	79.5	3,460	230	10,360	> 2 mi	33.5	63.0	21.6		55	57.2	57.2 - 64	0 - 6.8
6	Van Buren Golf Center	79.5	5,720	1,260	8,940	10,220	28.1	44.5	23.2	21.8	65	57.2	57.2 - 57.4	0 - 0.2
7	Jurupa Hills Country Club	79.5	> 2 mi	9,530	1,320	1,930		22.5	44.0	39.9	N/A	47	47 - 48.8	0 - 1.8
8	Martha McLean–Anza Narrows Regional Park	79.5	> 2 mi	9,810	240	940		22.2	62.5	47.7	65	47	47 - 62.6	0 - 15.6
9	Residential S of Anza Creek	79.5	> 2 mi	> 2 mi	490	1,500			54.8	42.6	55	47	48.3 - 55.4	1.3 - 8.4
10	Rancho Jurupa Park	79.5	> 2 mi	> 2 mi	5,610	2,950			28.3	35.3	N/A	47	47.1 - 47.3	0.1 - 0.3
11	Residential S of Old Ranch Creek	79.5	> 2 mi	> 2 mi	4,910	320			29.7	59.4	55	47	47.1 - 59.6	0.1 - 12.6

**Table 19. Project Operational Noise Level Analysis (Well Pumps & Motors), Tributaries Restoration Project**

Reference Pump & Motor SPL: 108 dBA\*  
 Reference Distance, feet: 3.3 feet

Receiver #	Description/Receiver Type	Location (City)	Distance to Well/Pump, Feet		Noise Level, dBA		Assumed Ambient Noise Level, dBA	Combined Noise Level, dBA	Noise Level Increase, dB
			Hidden Valley Creek	Old Ranch Creek	Hidden Valley Creek	Old Ranch Creek			
1	Paradise Knolls Golf Course	Northwest of Hidden Valley Creek (Jurupa Valley)	4,120	> 2 mi	31	--	Daytime 49.9 Nighttime 45.5	49.9 45.6	0.0 0.1
2	Single Family Residential	South of Hidden Valley Creek (Riverside)	530	> 2 mi	53	--	Daytime 48.3 Nighttime 44.8	54.1 53.4	5.8 8.6
3	Single Family Residential	North of Hidden Valley Creek (Jurupa Valley)	1,080	> 2 mi	45	--	Daytime 49.9 Nighttime 45.5	51.1 48.3	1.2 2.8
4	Rutland Park	Southwest of Lower Hole Creek (Riverside)	3,980	> 2 mi	31	--	Daytime 57.2 Nighttime 59.2	57.2 59.2	0.0 0.0
5	Single Family Residential	West of Lower Hole Creek (Riverside)	3,580	> 2 mi	32	--	Daytime 57.2 Nighttime 59.2	57.2 59.2	0.0 0.0
6	Van Buren Golf Center	Southeast of Lower Hole Creek (Riverside)	5,860	> 2 mi	27	--	Daytime 57.2 Nighttime 59.2	57.2 59.2	0.0 0.0
7	Jurupa Hills Country Club and Single Family Residential	North of Anza Creek (Jurupa Valley)	> 2 mi	7,050	--	25	Daytime 47.0 Nighttime 44.3	47.0 44.3	0.0 0.0
8	Martha McLean–Anza Narrows Regional Park	West of Anza Creek (Riverside)	> 2 mi	6,280	--	26	Daytime 47.0 Nighttime 44.3	47.0 44.4	0.0 0.1
9	Single Family Residential	South of Anza Creek (Riverside)	> 2 mi	5,130	--	28	Daytime 47.0 Nighttime 44.3	47.1 44.4	0.1 0.1
10	Rancho Jurupa Park	North of Old Ranch Creek (Jurupa Valley)	> 2 mi	3,640	--	32	Daytime 47.0 Nighttime 44.3	47.1 44.5	0.1 0.2
11	Single Family Residential	South of Old Ranch Creek (Riverside)	> 2 mi	930	--	47	Daytime 47.0 Nighttime 44.3	49.9 48.7	2.9 4.4

\* Estimated based on 100 horsepower electrically powered pump and motor, with prediction algorithms from *Industrial Noise Control and Acoustics* (Barron, 2003).

