Appendix CC

Noise Measurements

List of Sub-Appendices:

Appendix CC-1 Detailed Long-Term Data

Appendix CC-2 Measurement Photos

Appendix CC-3 Construction Noise Calculations

Appendix CC-1
Detailed Long-Term Data

Table CC-1-1
Detailed Long-Term Noise Measurement Data Summary

25-Hour Measurement Hourly Results at LT-1 (dBA)							
Hour Start	**Hour End**	**Statistical Descriptors**					
		L_{eq}	**L_{max}**	**L_{min}**	**L_{10}**	**L_{50}**	**L_{90}**
10:00	11:00	55.2	79.0	35.6	54.1	38.4	35.8
11:00	12:00	50.1	72.3	36.0	54.1	41.2	36.6
12:00	13:00	48.0	67.7	35.8	51.5	42.1	36.5
13:00	14:00	48.3	68.4	35.8	52.0	38.5	36.2
14:00	15:00	52.3	72.5	35.9	56.5	40.9	36.3
15:00	16:00	62.7	86.7	35.9	60.3	38.6	36.2
16:00	17:00	61.1	75.0	36.0	67.0	44.9	36.4
17:00	18:00	64.6	76.1	38.7	69.9	58.6	43.7
18:00	19:00	68.8	83.6	54.2	72.9	66.9	60.8
19:00	20:00	56.6	70.8	36.7	62.4	52.9	41.1
20:00	21:00	60.1	84.1	37.6	63.1	54.3	44.0
21:00	22:00	63.4	76.1	38.7	69.0	58.3	45.6
22:00	23:00	67.7	79.3	46.8	73.5	64.6	54.3
23:00	24:00	67.1	80.0	45.1	72.3	64.1	55.4
00:00	01:00	74.6	86.8	56.5	79.7	73.8	65.6
01:00	02:00	74.5	86.5	56.7	79.4	71.4	64.5
02:00	03:00	73.6	85.6	53.3	79.0	71.0	63.9
03:00	04:00	74.1	87.5	56.7	79.3	71.6	64.4
04:00	05:00	69.8	90.2	43.4	75.7	65.8	52.4
05:00	06:00	68.6	83.9	46.4	74.1	65.3	57.8
06:00	07:00	73.6	85.2	54.1	78.9	71.5	62.4
07:00	08:00	70.1	83.2	45.1	75.5	66.3	53.1
08:00	09:00	70.9	85.2	43.7	77.0	63.5	52.7
09:00	10:00	72.3	84.8	43.8	77.9	69.7	58.7
10:00	11:00	63.1	81.2	36.3	69.1	49.8	38.7

Source: URS Corporation, 2008.

Notes:

dBA = A-weighted decibel
L_{10} = noise level equal to or exceeds 10 percent of the time
L_{50} = noise level equal to or exceeds 50 percent of the time
L_{90} = noise level equal to or exceeds 90 percent of the time
L_{eq} = equivalent sound level
L_{max} = maximum equivalent sound level
L_{min} = minimum equivalent sound level
LT-1 = Measurement Location 2

Table CC-1-2
Detailed Long-Term Noise Measurement Data

25-Hour Measurement Hourly Results at LT-3 (dBA)							
Hour Start	**Hour End**	**Statistical Descriptors**					
		L_{eq}	**L_{max}**	**L_{min}**	**L_{10}**	**L_{50}**	**L_{90}**
12:00	13:00	56.3	79.2	40.2	58.1	45.8	42.0
13:00	14:00	48.3	68.3	40.0	53.0	44.5	42.0
14:00	15:00	52.5	71.1	39.9	58.4	44.2	41.1
15:00	16:00	60.8	88.3	40.5	58.2	45.6	42.2
16:00	17:00	50.9	74.0	39.7	50.8	43.3	40.5
17:00	18:00	49.2	67.9	40.9	55.7	43.3	41.5
18:00	19:00	45.5	54.9	41.6	48.8	45.0	42.5
19:00	20:00	45.6	58.5	39.7	49.3	44.1	40.8
20:00	21:00	47.4	58.3	43.1	49.3	46.6	44.2
21:00	22:00	46.5	57.8	40.9	48.9	46.0	42.2
22:00	23:00	46.8	55.2	43.1	48.9	46.8	43.8
23:00	24:00	52.0	68.2	42.0	58.4	46.3	43.1
00:00	01:00	47.7	51.8	43.2	49.9	47.6	44.9
01:00	02:00	46.7	56.3	43.0	48.7	46.5	44.5
02:00	03:00	55.4	71.2	43.8	60.3	46.8	45.1
03:00	04:00	60.8	73.5	45.1	66.3	58.1	48.5
04:00	05:00	56.7	73.7	42.5	63.0	51.8	44.8
05:00	06:00	57.5	72.1	43.4	62.8	53.6	47.8
06:00	07:00	55.4	70.3	44.4	59.8	52.3	47.5
07:00	08:00	55.6	69.3	44.6	60.7	52.3	46.4
08:00	09:00	53.7	69.8	41.4	60.0	49.4	43.6
09:00	10:00	56.8	72.4	42.4	61.9	53.7	46.6
10:00	11:00	65.3	88.1	41.1	67.2	59.0	48.9
11:00	12:00	61.6	75.1	43.5	66.1	59.0	50.4
12:00	13:00	62.2	73.7	43.6	66.6	60.4	53.4

Source: URS Corporation, 2008.

Notes:

dBA = A-weighted decibel
L_{10} = noise level equal to or exceeds 10 percent of the time
L_{50} = noise level equal to or exceeds 50 percent of the time
L_{90} = noise level equal to or exceeds 90 percent of the time
L_{eq} = equivalent sound level
L_{max} = maximum equivalent sound level
L_{min} = minimum equivalent sound level
LT-3 = Measurement Location 8

Table CC-1-3
Detailed Long-Term Noise Measurement Data Summary

25-Hour Measurement Hourly Results at LT-4 (dBA)							
Hour Start	**Hour End**	**Statistical Descriptors**					
		L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
16:00	17:00	58.5	72.4	49.1	65.0	53.3	49.3
17:00	18:00	52.9	67.5	49.2	57.3	50.5	49.2
18:00	19:00	60.0	82.8	49.4	58.0	50.6	49.4
19:00	20:00	51.5	68.3	49.0	53.5	49.8	49.1
20:00	21:00	50.3	58.1	49.2	51.4	50.0	49.2
21:00	22:00	53.6	72.6	49.6	55.1	50.4	49.6
22:00	23:00	51.4	59.4	49.8	53.6	51.0	50.1
23:00	24:00	51.0	53.1	49.7	52.3	50.7	50.1
00:00	01:00	52.9	56.5	49.7	55.1	53.0	50.3
01:00	02:00	52.6	63.4	50.2	54.8	52.4	50.8
02:00	03:00	51.4	64.5	49.3	53.1	51.1	49.4
03:00	04:00	52.2	73.4	49.3	53.6	51.2	49.8
04:00	05:00	50.5	52.9	49.1	52.0	50.5	49.3
05:00	06:00	56.3	73.0	50.5	58.4	54.9	51.5
06:00	07:00	54.7	72.0	49.9	59.1	52.2	50.3
07:00	08:00	52.6	70.4	49.2	54.3	50.8	49.4
08:00	09:00	53.6	76.0	49.0	54.9	50.4	49.2
09:00	10:00	60.0	83.5	48.7	55.9	50.2	49.2
10:00	11:00	60.7	82.8	48.3	63.8	52.5	49.3
11:00	12:00	50.6	65.8	48.5	51.8	49.7	49.1
12:00	13:00	51.1	69.9	48.7	52.6	49.9	49.1
13:00	14:00	50.9	64.0	48.7	52.7	49.8	49.1
14:00	15:00	54.0	74.1	48.3	58.9	49.7	49.0
15:00	16:00	52.2	70.3	48.7	54.6	49.8	49.1
16:00	17:00	51.2	67.0	48.8	53.3	49.8	49.1

Source: URS Corporation, 2008.

Notes:

dBA = A-weighted decibel
L_{10} = noise level equal to or exceeds 10 percent of the time
L_{50} = noise level equal to or exceeds 50 percent of the time
L_{90} = noise level equal to or exceeds 90 percent of the time
L_{eq} = equivalent sound level
L_{max} = maximum equivalent sound level
L_{min} = minimum equivalent sound level
LT-4 = Measurement Location 9

Table CC-1-4
Detailed Long-Term Noise Measurement Data Summary

25-Hour Measurement Hourly Results at LT-5 (dBA)							
Hour Start	**Hour End**	**Statistical Descriptors**					
		L_{eq}	**L_{max}**	**L_{min}**	**L_{10}**	**L_{50}**	**L_{90}**
15:00	16:00	47.5	70.0	35.0	51.2	36.5	35.1
16:00	17:00	39.5	57.2	34.9	43.1	36.4	35.1
17:00	18:00	47.5	68.8	34.9	53.8	39.5	35.1
18:00	19:00	55.8	76.3	35.2	57.0	39.3	35.6
19:00	20:00	42.9	55.4	35.4	47.8	41.0	36.4
20:00	21:00	42.4	55.3	35.6	47.1	40.7	36.5
21:00	22:00	45.6	64.6	35.4	51.1	37.6	35.9
22:00	23:00	41.3	57.1	35.2	43.9	39.0	36.2
23:00	24:00	46.4	65.8	34.9	52.0	37.6	35.3
00:00	01:00	37.6	46.3	34.8	40.0	36.8	35.2
01:00	02:00	38.5	48.2	34.9	42.1	37.0	35.2
02:00	03:00	37.6	51.5	34.9	41.0	36.4	35.1
03:00	04:00	39.0	49.8	35.0	43.2	37.2	35.3
04:00	05:00	40.1	54.5	35.1	43.9	37.6	35.6
05:00	06:00	41.5	53.4	35.5	45.4	39.4	37.0
06:00	07:00	44.5	54.6	36.0	49.3	42.7	38.0
07:00	08:00	45.1	55.9	38.1	48.2	43.4	40.3
08:00	09:00	43.7	60.2	36.0	47.6	41.4	37.8
09:00	10:00	37.9	49.8	35.1	40.7	36.3	35.2
10:00	11:00	39.8	52.9	35.3	43.9	37.5	35.5
11:00	12:00	41.4	59.9	35.7	45.0	38.4	36.2
12:00	13:00	39.8	52.3	35.4	43.6	38.0	36.1
13:00	14:00	58.4	82.8	35.6	55.7	38.8	36.1
14:00	15:00	39.8	53.5	35.5	44.6	37.0	35.6
15:00	16:00	38.3	53.3	35.3	41.4	36.8	35.3

Source: URS Corporation, 2008.

Notes:

dBA = A-weighted decibel
L_{10} = noise level equal to or exceeds 10 percent of the time
L_{50} = noise level equal to or exceeds 50 percent of the time
L_{90} = noise level equal to or exceeds 90 percent of the time
L_{eq} = equivalent sound level
L_{max} = maximum equivalent sound level
L_{min} = minimum equivalent sound level
LT-5 = Measurement Location 1

Table CC-1-5
Detailed Long-Term Noise Measurement Data Summary

25-Hour Measurement Hourly Results at LT-6 (dBA)							
Hour Start	**Hour End**	**Statistical Descriptors**					
		L_{eq}	**L_{max}**	**L_{min}**	**L_{10}**	**L_{50}**	**L_{90}**
13:00	14:00	54.3	70.9	38.5	59.0	44.9	41.3
14:00	15:00	52.5	71.4	37.5	56.6	43.2	38.9
15:00	16:00	54.7	75.5	38.1	59.4	42.7	39.6
16:00	17:00	54.0	71.6	38.1	58.1	42.5	40.0
17:00	18:00	58.7	78.1	36.1	64.8	38.4	36.3
18:00	19:00	63.6	87.3	36.1	61.7	39.8	36.3
19:00	20:00	52.2	72.0	36.2	58.4	38.2	36.2
20:00	21:00	48.8	72.3	36.1	48.0	37.8	36.3
21:00	22:00	52.2	75.2	36.4	55.9	40.6	36.7
22:00	23:00	54.7	74.7	36.6	59.7	40.2	37.2
23:00	24:00	51.9	69.8	36.4	58.7	38.3	36.6
00:00	01:00	49.0	72.0	36.4	52.6	37.7	36.4
01:00	02:00	47.0	70.3	36.1	46.2	36.9	36.1
02:00	03:00	48.0	71.5	36.4	43.2	37.9	36.5
03:00	04:00	46.7	70.2	36.3	47.7	38.0	36.4
04:00	05:00	50.3	74.0	36.7	52.1	37.9	36.8
05:00	06:00	54.1	73.2	36.8	60.5	39.7	37.3
06:00	07:00	56.4	71.4	37.4	62.1	46.8	38.4
07:00	08:00	56.0	72.3	40.2	60.6	48.8	42.0
08:00	09:00	53.6	70.6	37.7	57.2	42.6	38.6
09:00	10:00	55.2	72.8	36.5	59.8	39.4	36.7
10:00	11:00	53.7	71.3	36.3	58.7	39.9	36.5
11:00	12:00	54.1	72.7	36.5	58.3	39.8	36.5
12:00	13:00	53.7	71.4	36.4	57.4	38.7	36.5
13:00	14:00	53.8	71.4	36.5	58.6	41.5	37.0

Source: URS Corporation, 2008.

Notes:

dBA = A-weighted decibel
L_{10} = noise level equal to or exceeds 10 percent of the time
L_{50} = noise level equal to or exceeds 50 percent of the time
L_{90} = noise level equal to or exceeds 90 percent of the time
L_{eq} = equivalent sound level
L_{max} = maximum equivalent sound level
L_{min} = minimum equivalent sound level
LT-6 = Measurement Location 5

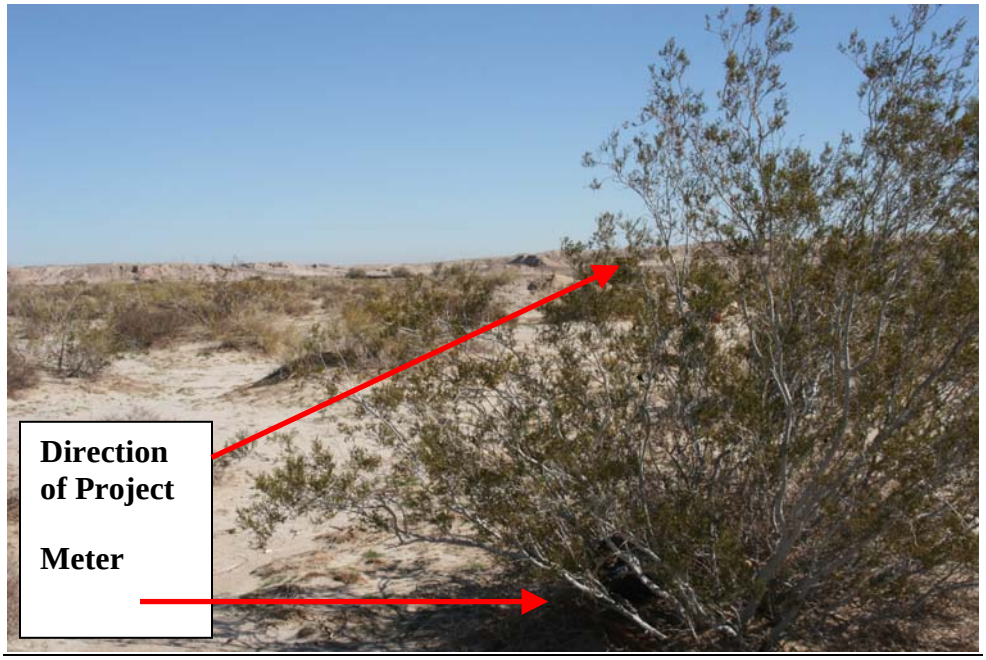
Appendix CC-2
Measurement Photos

Photograph #1

Date: 5 February 2008

Comments:

ML1, facing residence (south).



Photograph #2

Date: 5 February 2008

Comments:

ML1, facing direction of Project (east).

Photograph #3

Date: 5 February 2008

Comments:

ML1, facing adjacent residence, Evan Hewes Highway (south/ southwest).

Photograph #4

Date: 29 January 2008

Comments:

ML2, facing Evan Hewes Highway (north).

Photograph #5

Date: 29 January 2008

Comments:

ML2, facing direction of Project (southeast).

Photograph #6

Date: 29 January 2008

Comments:

ML2, facing Interstate 8 (south).

Photograph #7

Date: 29 January 2008

Comments:

ML3, facing direction of Project (east).

Photograph #8

Date: 29 January 2008

Comments:

ML3, facing Evan Hewes Highway (north).

Photograph #9

Date: 29 January 2008

Comments:

ML3, facing United States Gypsum Plant (northeast).

Photograph #10

Date: 29 January 2008

Comments:

ML3, facing direction of Interstate 8 (south).

Photograph #11

Date: 29 January 2008

Comments:

ML4, facing Dunaway Road (east).

Photograph #12

Date: 29 January 2008

Comments:

ML4, facing direction of Project (west).

Photograph #13

Date: 29 January 2008

Comments:

ML4, facing Interstate 8 (south).

Photograph #14

Date: 29 January 2008

Comments:

ML4, facing Evan Hewes Highway (north).

Photograph #15

Date: 05 February 2008

Comments:

ML5, measurement setup (east).

Photograph #16

Date: 05 February 2008

Comments:

ML5, facing Evan Hewes Highway (south).

Photograph #17

Date: 05 February 2008

Comments:

ML5, facing direction of Project (west).

Photograph #18

Date: 05 February 2008

Comments:

ML6, facing Interstate 8 (south).

Photograph #19

Date: 29 January 2008

Comments:

ML6, facing Evan Hewes Highway (north).

Photograph #20

Date: 29 January 2008

Comments:

ML7, facing substation in the distance (south).

Photograph #21

Date: 29 January 2008

Comments:

ML7, facing Interstate 8 (north).

Photograph #22

Date: 29 January 2008

Comments:

ML8, facing substation (west).

Photograph #23

Date: 29 January 2008

Comments:

ML8, facing Interstate 8 (north).

Photograph #24

Date: 29 January 2008

Comments:

ML9, facing the Fern Canal and Western Main channel (southeast).

Photograph #25

Date: 29 January 2008

Comments:

ML9, at the intersection of Libert Road and Mandrapa Road (west).

Photograph #26

Date: 29 January 2008

Comments:

ML9, facing direction of Interstate 8 (north).

Appendix CC-3
Construction Noise Calculations

Table CC-3-1
Monthly Construction Roster and Usage (Overall)

Equipment Description	Utilization	HP	Base Sound (SPL at 1 m, dBA)	Project Monthly Construction Equipment Use-Months																																											
				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	29	30	31	32	33	34	35	36	37	38	39	40
4-Wheeler	100%	15	101	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aerial Lift	100%	120	111	6	6	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Air Compressor	100%	50	107	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asphalt Paver	100%	120	111	0	3	2	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe	100%	120	111	5	11	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	13	13	13	13	13	13	13	6	6	6	6	6	6	6	6	0	0	0	0	0
Compactor	100%	120	111	4	14	14	14	14	14	10	7	5	5	5	5	7	7	7	7	7	7	7	4	4	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	0
Concrete Pump	100%	250	114	1	1	3	3	3	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crane	100%	250	114	3	3	7	7	7	10	10	10	10	10	10	10	10	10	8	7	7	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Dozer	100%	250	114	4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Drilling Rig	100%	250	114	1	2	7	6	6	9	9	9	9	9	9	9	9	9	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Truck	100%	250	114	3	12	12	5	5	5	5	5	3	3	3	3	6	6	6	6	4	4	4	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Flatbed Truck	100%	250	114	9	14	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	14	12	12	12	12	12	12	12	12	6	6	6	6	6	6	6	6	0	0	0	0	0
Fork Lift	100%	50	107	5	5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Generator	100%	50	107	1	1	2	2	2	6	6	6	6	6	6	6	6	3	3	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Grader	100%	175	112	2	11	11	5	5	5	5	5	3	3	3	3	6	6	6	6	6	6	6	4	4	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	0
Light Tower	100%	50	107	1	1	2	2	2	2	2	1	1	1	1	1	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loader	100%	250	114	2	10	10	10	10	10	10	10	7	5	5	5	7	7	7	6	4	4	4	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Maxi Sneeker (Trencher)	100%	50	107	0	2	3	3	3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	0	0	0	0	0
Pickup Truck	100%	150	111	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Skid Steer (Bobcat)	100%	50	107	0	0	0	0	2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0
Telehandler	100%	120	111	0	0	0	0	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Water Truck	100%	250	114	5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	4	4	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	0
Welding Machine	100%	50	107	1	1	3	3	3	3	2	2	2	2	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aggregate				**62**	**120**	**154**	**139**	**143**	**161**	**155**	**146**	**135**	**133**	**133**	**133**	**146**	**143**	**137**	**131**	**127**	**118**	**116**	**93**	**90**	**87**	**87**	**87**	**87**	**87**	**85**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**31**	**31**	**31**	**31**	**28**

Source: URS Corporation, 2008.

Notes:

% = percent
dBA = A-weighted decibel
HP = horsepower
m = meter
SPL = sound-pressure level

Table CC-3-2
Monthly Construction Roster and Usage (each 18-megawatt block)

Equipment Description	Utilization	HP	Base Sound (SPL at 1 m, dBA)	Project Monthly Construction Equipment Use-Months			
				1	2	3	4
Power Line Construction Trencher	100%	125	111	1			
Backhoe	100%	120	111	1			
Compactor	100%	120	111	1			
Cable/Rigging Truck	100%	250	114	1			
Flatbed Truck with Boom	100%	275	114	1			
Pickup Truck	100%	150	111	1			
Dozer	100%	250	114	1			
Grader	100%	175	112	1			
Loader	100%	250	114	1			
Backhoe	100%	120	111	1			
Dump Truck	100%	250	114	1			
Compactor	100%	120	111	1			
Vibratory Machine	100%	15	101		3		
Fuel/Service Truck	100%	200	113		1		
Flatbed Truck with Boom	100%	275	114		3		
Pickup Truck	100%	150	111		3		
Crane	100%	250	114		3		
Flatbed Truck with Boom	100%	275	114			1	
Maxi Sneeker	100%	100	110			1	
Backhoe	100%	120	111			1	
Maxi Sneeker	100%	100	110			5	
Flatbed Truck with Boom	100%	275	114			5	
Backhoe	100%	120	111			5	
Skid Steer	100%	45	106			5	
Telehandler	100%	120	111				4
Solar Two Field Service Truck	100%	250	114				8
Crane	100%	250	114				2
Pickup Truck	100%	150	111				4
Track Transporter	100%	275	114				2
Grader	100%	175	112		1	1	1
Compactor	100%	120	111		1	1	1
Aggregate				**12**	**15**	**25**	**22**

Source: URS Corporation, 2008.
Notes:
% = percent
dBA = A-weighted decibel
HP = horsepower
m = meter
SPL = sound-pressure level