APPENDIX I

NOISE MEASUREMENT DATA, NOISE EMISSION DATA, AND IMPACT CALCULATIONS

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INTRODUCTION

The following appendix was provide to document and support the evaluation of the noise monitoring data, noise emission data, and impact calculations from noise and vibration associated with the Sunshine Gas Producers Renewable Energy Project. The noise analysis is provided in Section 3.7 and Section 4.7 of this Draft SEIR.

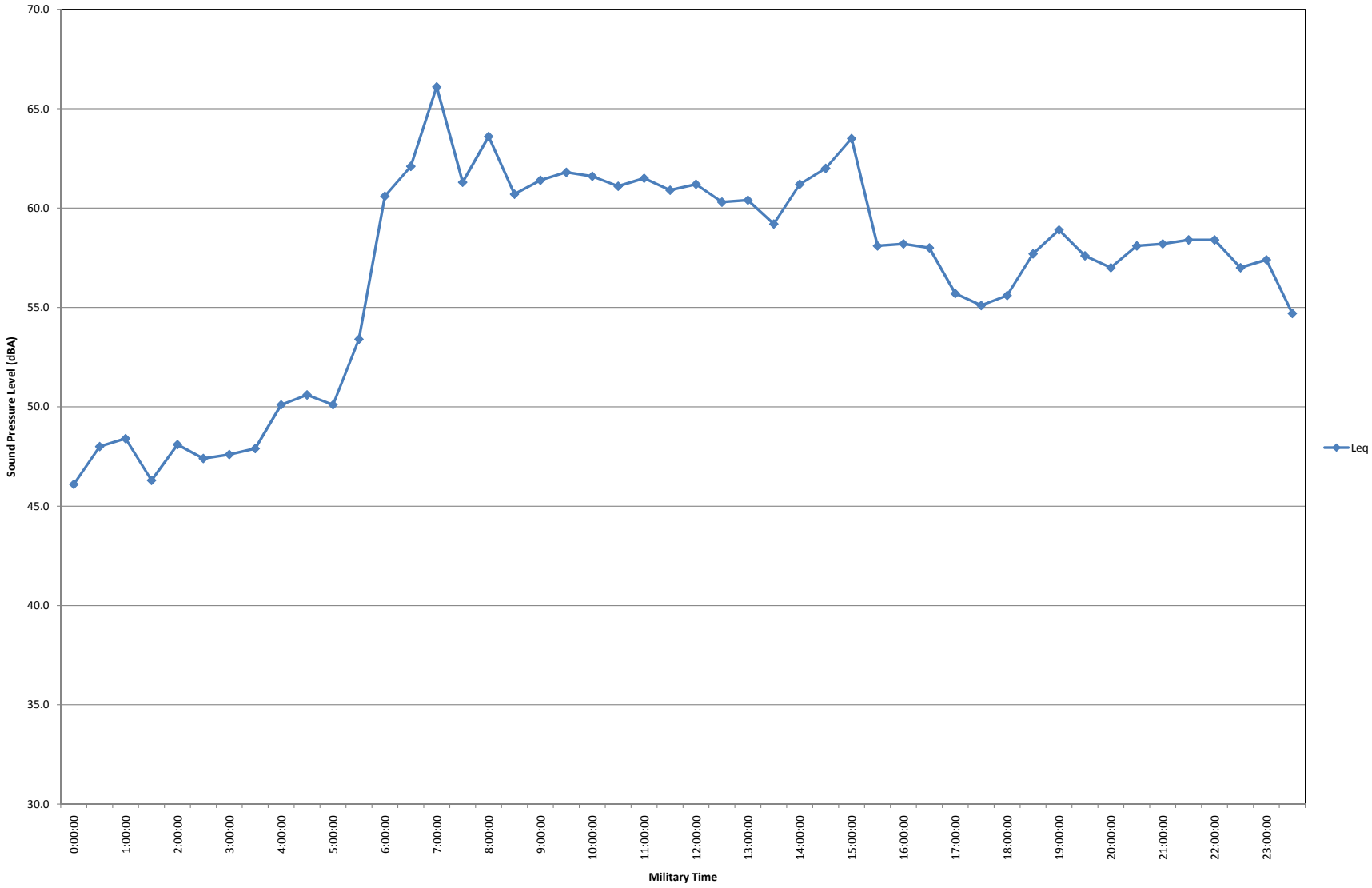
1 Noise Monitoring Data

ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Administration Building

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/15/2009	0:00:00	46.1	61.9	43.2
10/15/2009	0:30:00	48.0	57.4	43.9
10/15/2009	1:00:00	48.4	52.0	45.1
10/15/2009	1:30:00	46.3	50.4	44.0
10/15/2009	2:00:00	48.1	63.6	44.5
10/15/2009	2:30:00	47.4	51.1	44.5
10/15/2009	3:00:00	47.6	53.2	44.3
10/15/2009	3:30:00	47.9	52.5	44.5
10/15/2009	4:00:00	50.1	56.1	47.5
10/15/2009	4:30:00	50.6	63.7	47.1
10/15/2009	5:00:00	50.1	62.2	46.6
10/15/2009	5:30:00	53.4	62.1	48.7
10/15/2009	6:00:00	60.6	72.9	51.7
10/15/2009	6:30:00	62.1	76.9	52.8
10/15/2009	7:00:00	66.1	82.2	53.7
10/15/2009	7:30:00	61.3	78.1	54.1
10/15/2009	8:00:00	63.6	81.3	55.5
10/15/2009	8:30:00	60.7	67.3	54.7
10/15/2009	9:00:00	61.4	68.4	56.6
10/15/2009	9:30:00	61.8	73.0	56.5
10/15/2009	10:00:00	61.6	72.9	56.7
10/15/2009	10:30:00	61.1	71.2	55.5
10/15/2009	11:00:00	61.5	77.6	55.3
10/15/2009	11:30:00	60.9	68.4	55.1
10/15/2009	12:00:00	61.2	89.1	53.6
10/15/2009	12:30:00	60.3	74.2	53.4
10/15/2009	13:00:00	60.4	71.6	52.6
10/15/2009	13:30:00	59.2	71.4	53.0
10/15/2009	14:00:00	61.2	79.2	53.2
10/15/2009	14:30:00	62.0	85.4	53.4
10/15/2009	15:00:00	63.5	79.7	52.4
10/15/2009	15:30:00	58.1	69.2	52.5
10/15/2009	16:00:00	58.2	65.8	51.6
10/15/2009	16:30:00	58.0	70.1	51.5
10/15/2009	17:00:00	55.7	64.8	51.4
10/15/2009	17:30:00	55.1	63.6	49.4
10/15/2009	18:00:00	55.6	67.9	49.9
10/15/2009	18:30:00	57.7	74.5	50.7
10/15/2009	19:00:00	58.9	71.3	51.4
10/15/2009	19:30:00	57.6	66.4	51.2
10/15/2009	20:00:00	57.0	65.8	49.6
10/15/2009	20:30:00	58.1	73.7	51.8
10/15/2009	21:00:00	58.2	65.5	51.4
10/15/2009	21:30:00	58.4	67.4	52.5
10/15/2009	22:00:00	58.4	73.0	51.2
10/15/2009	22:30:00	57.0	67.7	50.6
10/15/2009	23:00:00	57.4	66.3	50.5
10/15/2009	23:30:00	54.7	62.6	49.1
24 Hour Leq=		59.2		

Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Administration Building
10-15-2009

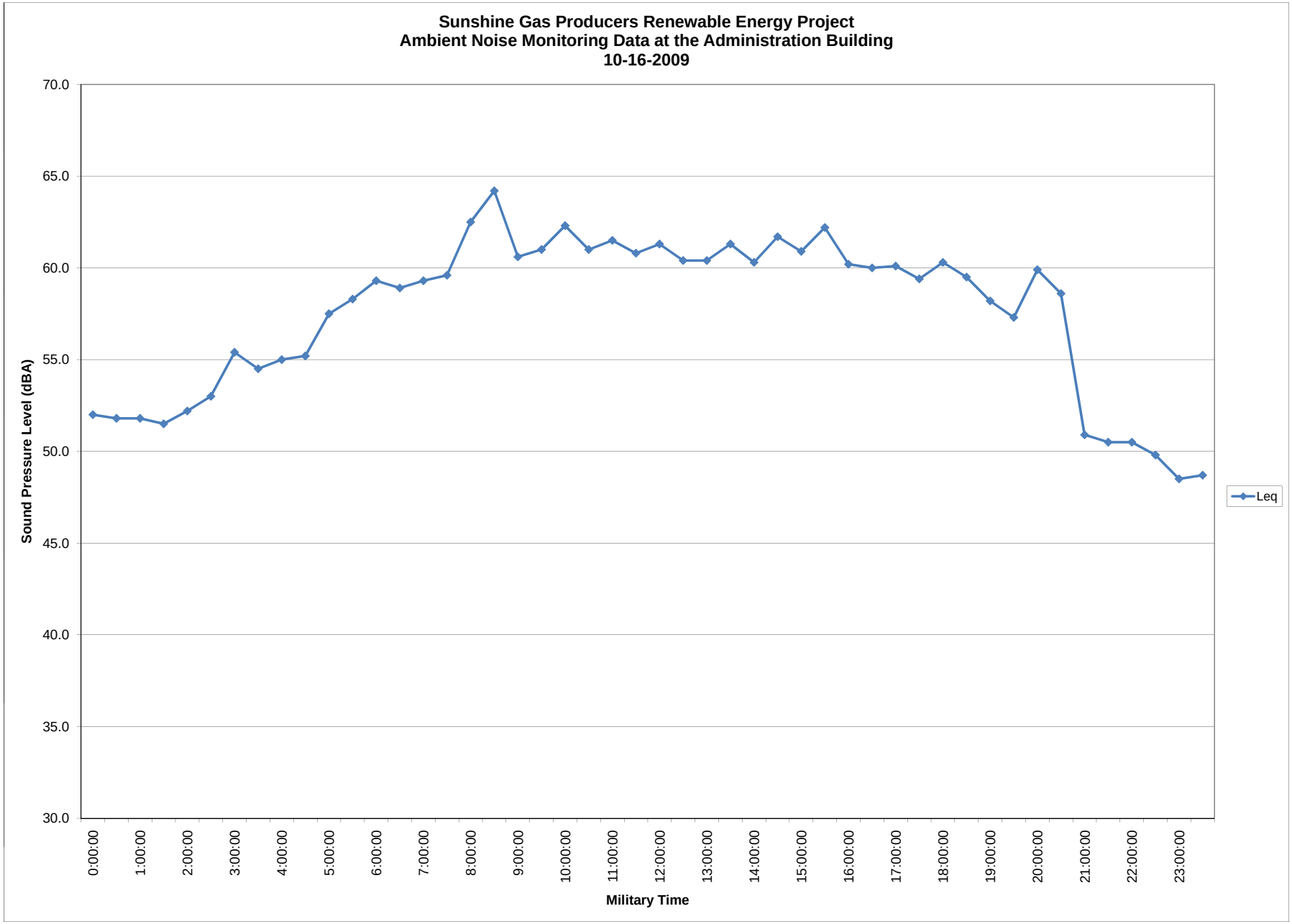


ARCADIS

Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Administration Building

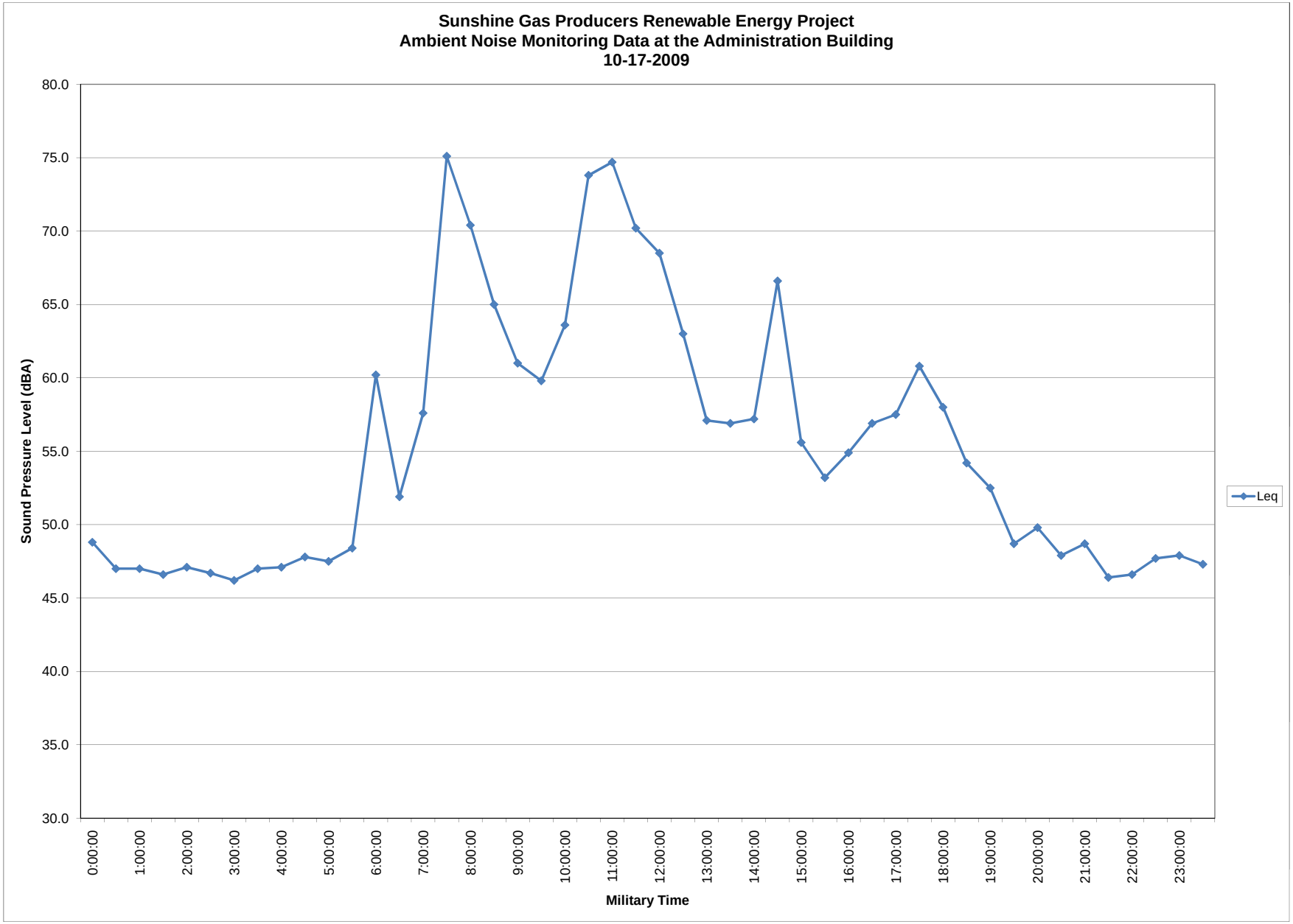
Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/16/2009	0:00:00	52.0	59.6	47.1
10/16/2009	0:30:00	51.8	59.4	47.9
10/16/2009	1:00:00	51.8	60.1	47.2
10/16/2009	1:30:00	51.5	57.6	47.2
10/16/2009	2:00:00	52.2	58.7	48.5
10/16/2009	2:30:00	53.0	59.8	49.1
10/16/2009	3:00:00	55.4	63.0	50.3
10/16/2009	3:30:00	54.5	61.7	50.1
10/16/2009	4:00:00	55.0	60.6	50.2
10/16/2009	4:30:00	55.2	69.4	51.8
10/16/2009	5:00:00	57.5	68.6	52.1
10/16/2009	5:30:00	58.3	68.6	53.4
10/16/2009	6:00:00	59.3	76.6	54.4
10/16/2009	6:30:00	58.9	68.9	53.9
10/16/2009	7:00:00	59.3	69.8	54.2
10/16/2009	7:30:00	59.6	67.9	53.7
10/16/2009	8:00:00	62.5	80.2	54.2
10/16/2009	8:30:00	64.2	76.7	54.4
10/16/2009	9:00:00	60.6	68.2	53.9
10/16/2009	9:30:00	61.0	76.7	54.5
10/16/2009	10:00:00	62.3	78.6	52.4
10/16/2009	10:30:00	61.0	71.5	54.2
10/16/2009	11:00:00	61.5	73.8	55.7
10/16/2009	11:30:00	60.8	66.9	54.6
10/16/2009	12:00:00	61.3	68.4	55.4
10/16/2009	12:30:00	60.4	72.4	54.7
10/16/2009	13:00:00	60.4	69.9	55.0
10/16/2009	13:30:00	61.3	72.7	56.1
10/16/2009	14:00:00	60.3	70.2	54.7
10/16/2009	14:30:00	61.7	75.2	53.1
10/16/2009	15:00:00	60.9	69.6	52.6
10/16/2009	15:30:00	62.2	74.2	53.5
10/16/2009	16:00:00	60.2	73.2	53.2
10/16/2009	16:30:00	60.0	72.7	52.6
10/16/2009	17:00:00	60.1	70.0	53.1
10/16/2009	17:30:00	59.4	74.4	53.0
10/16/2009	18:00:00	60.3	71.9	52.5
10/16/2009	18:30:00	59.5	74.6	50.8
10/16/2009	19:00:00	58.2	69.5	51.0
10/16/2009	19:30:00	57.3	70.8	50.1
10/16/2009	20:00:00	59.9	76.6	50.2
10/16/2009	20:30:00	58.6	68.7	48.5
10/16/2009	21:00:00	50.9	60.0	48.5
10/16/2009	21:30:00	50.5	52.6	48.8
10/16/2009	22:00:00	50.5	54.1	47.9
10/16/2009	22:30:00	49.8	55.2	46.9
10/16/2009	23:00:00	48.5	52.6	46.7
10/16/2009	23:30:00	48.7	53.8	45.8
24 Hour Leq=		59.1		


Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Administration Building
10-16-2009
Sound Pressure Level (dBA)
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
0:00:00
1:00:00
2:00:00
3:00:00
4:00:00
5:00:00
6:00:00
7:00:00
8:00:00
9:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
Military Time
Leq

ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Administration Building

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/17/2009	0:00:00	48.8	59.8	45.7
10/17/2009	0:30:00	47.0	60.9	45.3
10/17/2009	1:00:00	47.0	56.8	45.2
10/17/2009	1:30:00	46.6	51.8	45.3
10/17/2009	2:00:00	47.1	55.8	45.5
10/17/2009	2:30:00	46.7	51.4	44.9
10/17/2009	3:00:00	46.2	49.6	44.7
10/17/2009	3:30:00	47.0	51.1	45.1
10/17/2009	4:00:00	47.1	49.7	45.2
10/17/2009	4:30:00	47.8	50.9	46.0
10/17/2009	5:00:00	47.5	50.9	45.6
10/17/2009	5:30:00	48.4	52.6	45.7
10/17/2009	6:00:00	60.2	88.4	46.0
10/17/2009	6:30:00	51.9	67.1	46.9
10/17/2009	7:00:00	57.6	76.2	48.7
10/17/2009	7:30:00	75.1	79.4	50.1
10/17/2009	8:00:00	70.4	79.7	56.9
10/17/2009	8:30:00	65.0	71.2	55.9
10/17/2009	9:00:00	61.0	67.1	53.7
10/17/2009	9:30:00	59.8	78.0	49.4
10/17/2009	10:00:00	63.6	80.7	51.2
10/17/2009	10:30:00	73.8	79.7	52.4
10/17/2009	11:00:00	74.7	81.2	54.9
10/17/2009	11:30:00	70.2	76.0	55.1
10/17/2009	12:00:00	68.5	78.2	50.3
10/17/2009	12:30:00	63.0	75.5	47.0
10/17/2009	13:00:00	57.1	72.9	47.2
10/17/2009	13:30:00	56.9	69.9	50.6
10/17/2009	14:00:00	57.2	72.1	48.6
10/17/2009	14:30:00	66.6	87.6	48.7
10/17/2009	15:00:00	55.6	67.7	48.2
10/17/2009	15:30:00	53.2	64.5	46.6
10/17/2009	16:00:00	54.9	64.4	46.6
10/17/2009	16:30:00	56.9	66.8	47.3
10/17/2009	17:00:00	57.5	65.9	47.0
10/17/2009	17:30:00	60.8	72.0	51.2
10/17/2009	18:00:00	58.0	73.8	49.2
10/17/2009	18:30:00	54.2	70.4	47.3
10/17/2009	19:00:00	52.5	68.7	47.9
10/17/2009	19:30:00	48.7	53.6	47.1
10/17/2009	20:00:00	49.8	66.4	46.9
10/17/2009	20:30:00	47.9	54.3	46.3
10/17/2009	21:00:00	48.7	58.5	46.3
10/17/2009	21:30:00	46.4	48.1	45.6
10/17/2009	22:00:00	46.6	48.7	45.5
10/17/2009	22:30:00	47.7	52.4	46.3
10/17/2009	23:00:00	47.9	52.5	46.2
10/17/2009	23:30:00	47.3	50.7	46.1
24 Hour Leq=		64.6		

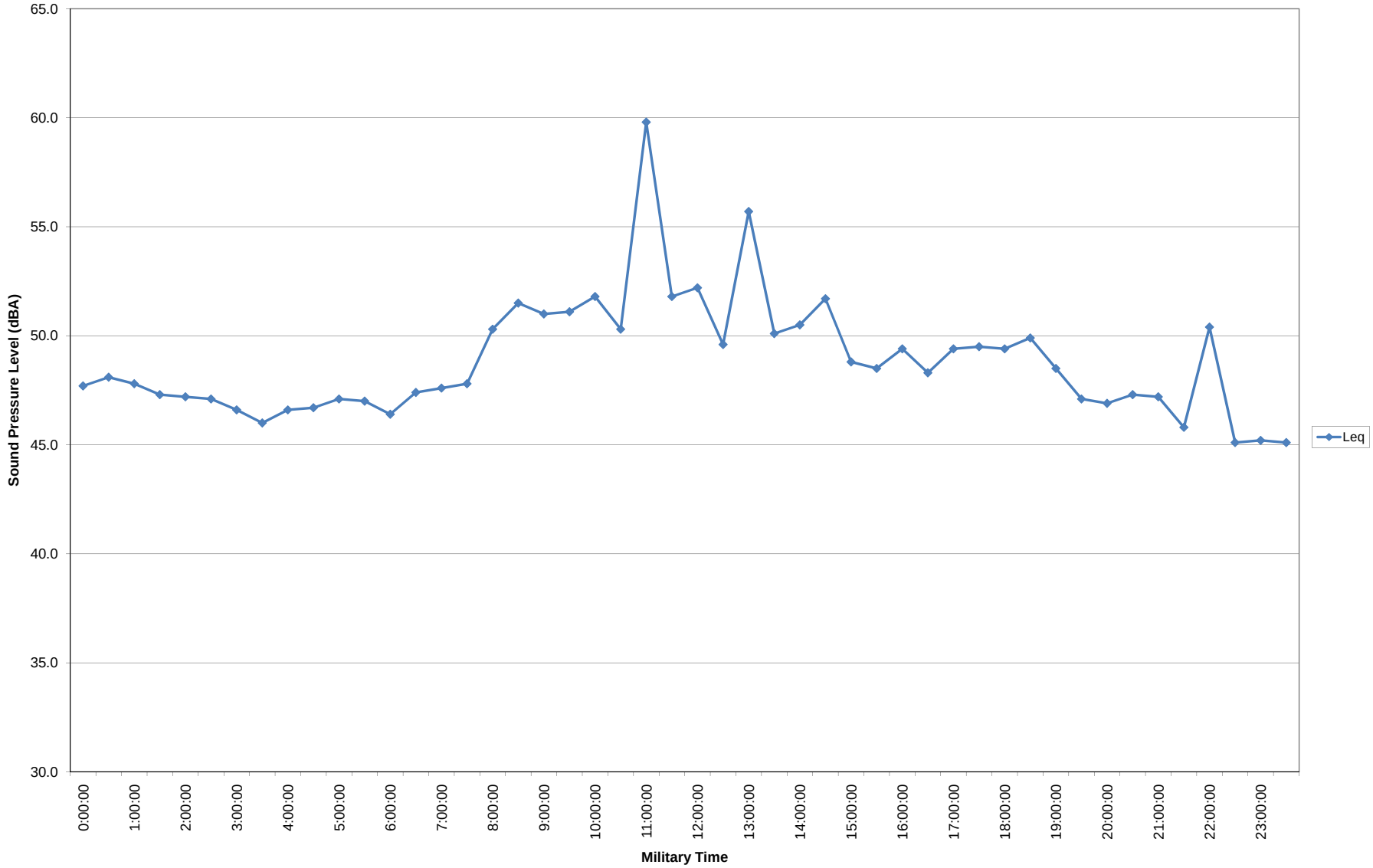

Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Administration Building
10-17-2009
Sound Pressure Level (dBA)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
0:00:00
1:00:00
2:00:00
3:00:00
4:00:00
5:00:00
6:00:00
7:00:00
8:00:00
9:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
Military Time
Leq

ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Administration Building

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/18/2009	0:00:00	47.7	50.2	46.3
10/18/2009	0:30:00	48.1	50.8	46.4
10/18/2009	1:00:00	47.8	51.8	46.2
10/18/2009	1:30:00	47.3	51.8	45.8
10/18/2009	2:00:00	47.2	54.3	45.9
10/18/2009	2:30:00	47.1	50.0	45.4
10/18/2009	3:00:00	46.6	49.5	45.3
10/18/2009	3:30:00	46.0	50.6	45.0
10/18/2009	4:00:00	46.6	52.9	44.9
10/18/2009	4:30:00	46.7	52.0	44.7
10/18/2009	5:00:00	47.1	50.2	45.2
10/18/2009	5:30:00	47.0	56.1	45.1
10/18/2009	6:00:00	46.4	53.4	44.7
10/18/2009	6:30:00	47.4	65.0	45.5
10/18/2009	7:00:00	47.6	55.6	45.5
10/18/2009	7:30:00	47.8	54.4	45.6
10/18/2009	8:00:00	50.3	59.8	45.8
10/18/2009	8:30:00	51.5	61.4	46.7
10/18/2009	9:00:00	51.0	58.0	46.3
10/18/2009	9:30:00	51.1	58.5	44.7
10/18/2009	10:00:00	51.8	73.5	44.0
10/18/2009	10:30:00	50.3	63.9	44.2
10/18/2009	11:00:00	59.8	82.3	45.1
10/18/2009	11:30:00	51.8	66.5	45.0
10/18/2009	12:00:00	52.2	71.0	45.3
10/18/2009	12:30:00	49.6	62.4	45.1
10/18/2009	13:00:00	55.7	77.4	44.4
10/18/2009	13:30:00	50.1	67.9	44.4
10/18/2009	14:00:00	50.5	62.3	45.6
10/18/2009	14:30:00	51.7	70.2	44.8
10/18/2009	15:00:00	48.8	60.3	45.3
10/18/2009	15:30:00	48.5	57.9	45.8
10/18/2009	16:00:00	49.4	63.6	45.5
10/18/2009	16:30:00	48.3	60.2	45.9
10/18/2009	17:00:00	49.4	60.9	45.9
10/18/2009	17:30:00	49.5	59.7	45.6
10/18/2009	18:00:00	49.4	62.9	46.9
10/18/2009	18:30:00	49.9	66.9	46.5
10/18/2009	19:00:00	48.5	57.7	45.9
10/18/2009	19:30:00	47.1	56.7	45.7
10/18/2009	20:00:00	46.9	56.2	45.4
10/18/2009	20:30:00	47.3	58.6	45.1
10/18/2009	21:00:00	47.2	57.7	45.1
10/18/2009	21:30:00	45.8	57.2	44.4
10/18/2009	22:00:00	50.4	70.3	44.2
10/18/2009	22:30:00	45.1	50.2	44.3
10/18/2009	23:00:00	45.2	52.0	44.3
10/18/2009	23:30:00	45.1	47.7	43.9
24 Hour Leq=		50.1		

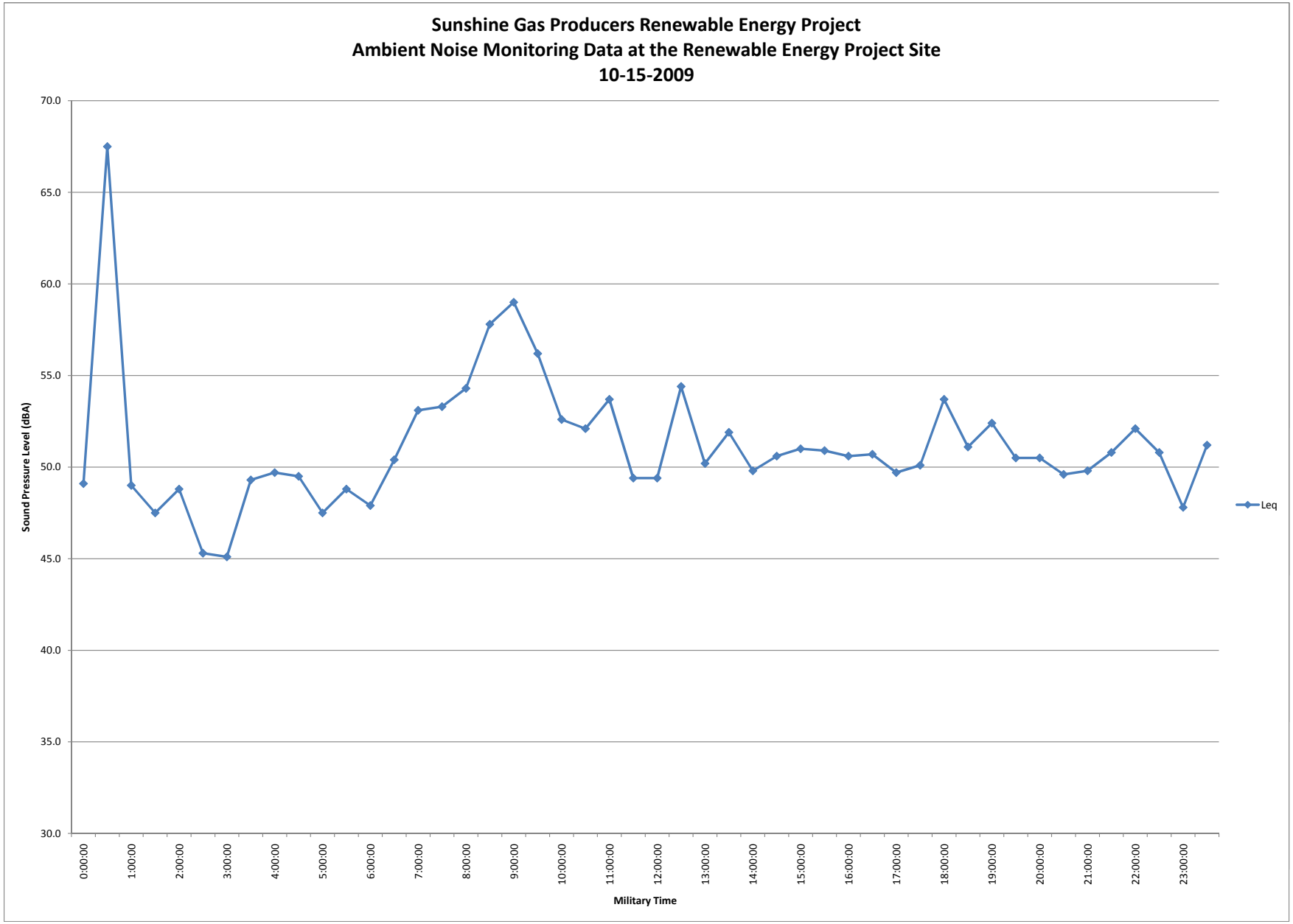
Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Administration Building
10-18-2009



ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Renewable Energy Project Site

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/15/2009	0:00:00	49.1	60.4	34.1
10/15/2009	0:30:00	67.5	99.2	35.8
10/15/2009	1:00:00	49.0	58.2	34.3
10/15/2009	1:30:00	47.5	56.6	34.2
10/15/2009	2:00:00	48.8	61.5	34.1
10/15/2009	2:30:00	45.3	54.7	33.0
10/15/2009	3:00:00	45.1	56.5	32.3
10/15/2009	3:30:00	49.3	57.5	34.6
10/15/2009	4:00:00	49.7	57.7	38.0
10/15/2009	4:30:00	49.5	58.4	38.6
10/15/2009	5:00:00	47.5	56.3	38.3
10/15/2009	5:30:00	48.8	65.1	41.1
10/15/2009	6:00:00	47.9	57.2	41.3
10/15/2009	6:30:00	50.4	57.6	44.7
10/15/2009	7:00:00	53.1	63.3	45.5
10/15/2009	7:30:00	53.3	63.5	45.3
10/15/2009	8:00:00	54.3	60.9	46.4
10/15/2009	8:30:00	57.8	65.3	50.1
10/15/2009	9:00:00	59.0	68.8	49.4
10/15/2009	9:30:00	56.2	63.1	47.0
10/15/2009	10:00:00	52.6	59.9	44.5
10/15/2009	10:30:00	52.1	59.0	43.2
10/15/2009	11:00:00	53.7	72.8	43.4
10/15/2009	11:30:00	49.4	59.9	42.1
10/15/2009	12:00:00	49.4	63.9	41.7
10/15/2009	12:30:00	54.4	76.4	40.3
10/15/2009	13:00:00	50.2	62.5	42.1
10/15/2009	13:30:00	51.9	63.6	42.5
10/15/2009	14:00:00	49.8	61.2	40.0
10/15/2009	14:30:00	50.6	62.3	39.3
10/15/2009	15:00:00	51.0	64.4	40.1
10/15/2009	15:30:00	50.9	64.6	41.3
10/15/2009	16:00:00	50.6	62.1	40.9
10/15/2009	16:30:00	50.7	61.7	41.7
10/15/2009	17:00:00	49.7	59.7	39.7
10/15/2009	17:30:00	50.1	64.0	37.6
10/15/2009	18:00:00	53.7	74.7	38.2
10/15/2009	18:30:00	51.1	59.7	40.8
10/15/2009	19:00:00	52.4	65.0	42.8
10/15/2009	19:30:00	50.5	59.8	41.9
10/15/2009	20:00:00	50.5	61.3	42.3
10/15/2009	20:30:00	49.6	58.6	42.0
10/15/2009	21:00:00	49.8	57.7	43.5
10/15/2009	21:30:00	50.8	62.0	44.0
10/15/2009	22:00:00	52.1	60.2	44.6
10/15/2009	22:30:00	50.8	65.0	42.8
10/15/2009	23:00:00	47.8	65.8	40.7
10/15/2009	23:30:00	51.2	60.2	40.7
24 Hour Leq=		54.3		

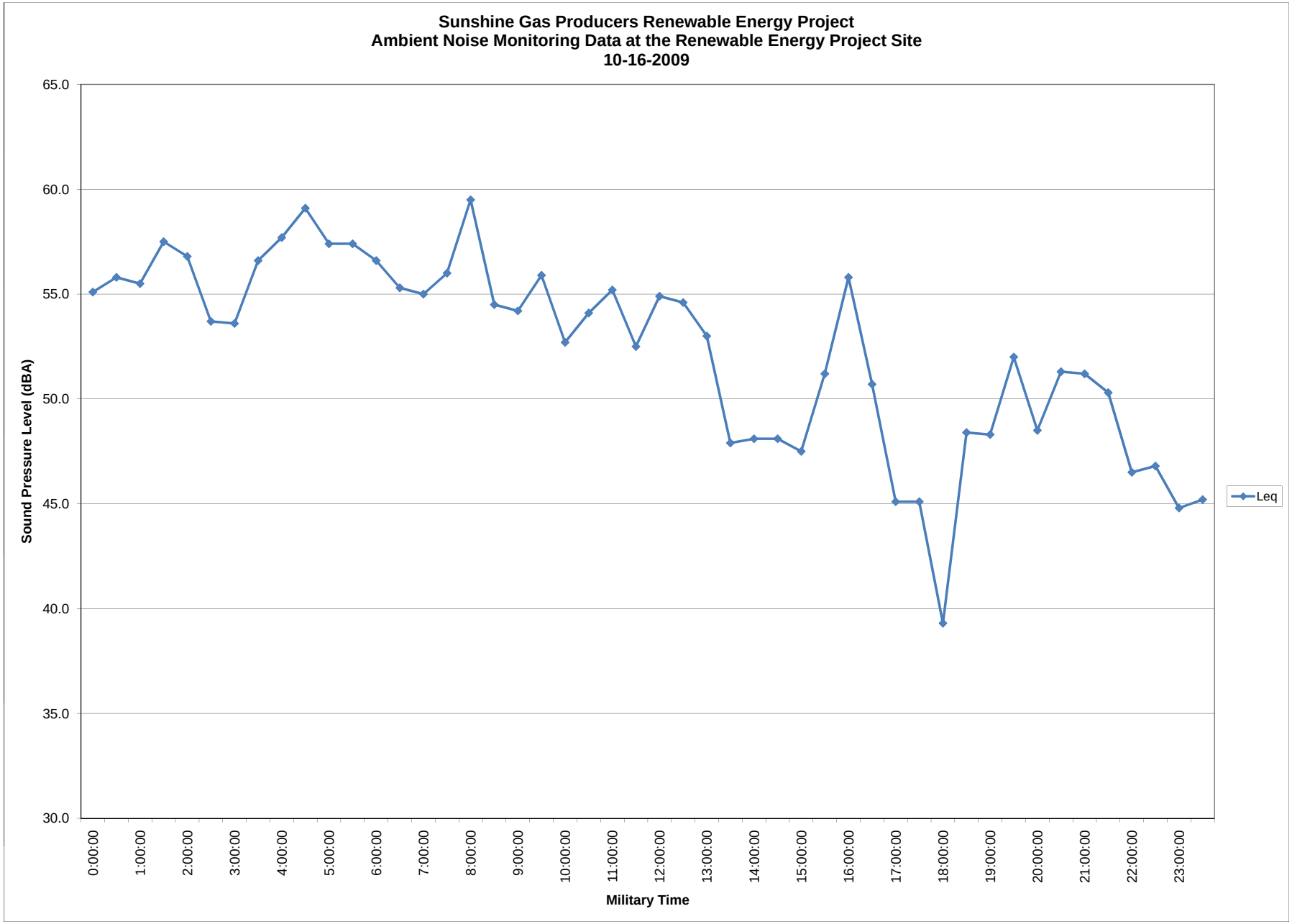

Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Renewable Energy Project Site
10-15-2009
Sound Pressure Level (dBA)
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
0:00:00
1:00:00
2:00:00
3:00:00
4:00:00
5:00:00
6:00:00
7:00:00
8:00:00
9:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
Military Time
Leq

ARCADIS

Infrastructure, environment, buildings

Project: **Sunshine Gas Producers Renewable Energy Project**
Project Number: **002-10498-00**
Location: **Renewable Energy Project Site**

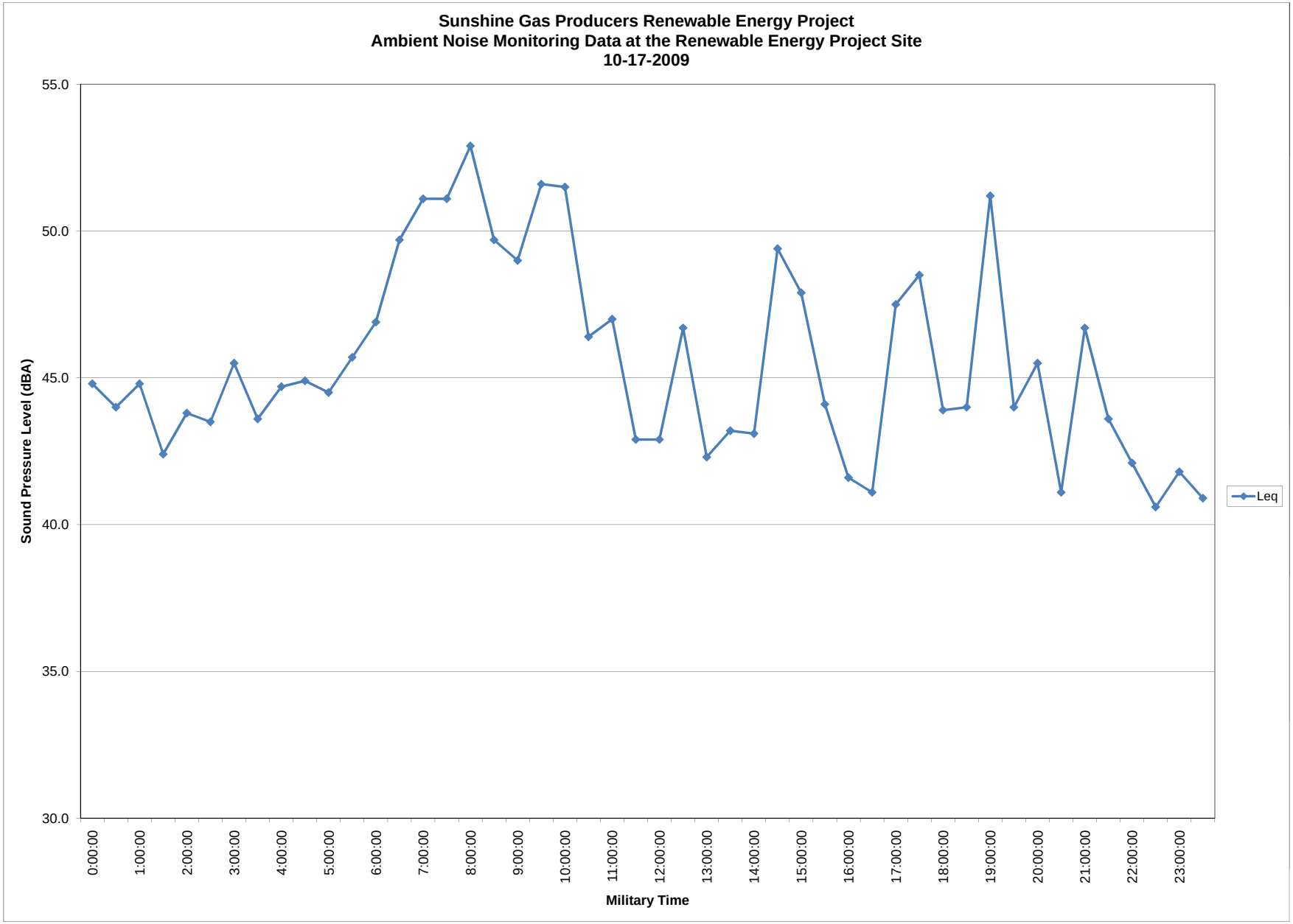
Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/16/2009	0:00:00	55.1	65.3	41.9
10/16/2009	0:30:00	55.8	65.2	44.2
10/16/2009	1:00:00	55.5	66.4	41.6
10/16/2009	1:30:00	57.5	68.1	45.2
10/16/2009	2:00:00	56.8	68.1	43.0
10/16/2009	2:30:00	53.7	60.3	42.7
10/16/2009	3:00:00	53.6	62.9	42.4
10/16/2009	3:30:00	56.6	66.7	42.9
10/16/2009	4:00:00	57.7	66.5	44.0
10/16/2009	4:30:00	59.1	67.9	47.9
10/16/2009	5:00:00	57.4	64.4	47.2
10/16/2009	5:30:00	57.4	67.2	47.7
10/16/2009	6:00:00	56.6	68.3	47.9
10/16/2009	6:30:00	55.3	65.4	47.9
10/16/2009	7:00:00	55.0	62.7	47.7
10/16/2009	7:30:00	56.0	64.9	47.3
10/16/2009	8:00:00	59.5	80.2	46.3
10/16/2009	8:30:00	54.5	69.3	45.2
10/16/2009	9:00:00	54.2	67.5	45.2
10/16/2009	9:30:00	55.9	66.4	45.3
10/16/2009	10:00:00	52.7	66.9	43.3
10/16/2009	10:30:00	54.1	66.4	44.0
10/16/2009	11:00:00	55.2	70.6	44.0
10/16/2009	11:30:00	52.5	61.6	44.8
10/16/2009	12:00:00	54.9	69.4	43.2
10/16/2009	12:30:00	54.6	63.2	47.2
10/16/2009	13:00:00	53.0	69.8	42.6
10/16/2009	13:30:00	47.9	61.3	41.6
10/16/2009	14:00:00	48.1	66.1	41.0
10/16/2009	14:30:00	48.1	63.4	40.6
10/16/2009	15:00:00	47.5	62.1	39.8
10/16/2009	15:30:00	51.2	70.0	39.7
10/16/2009	16:00:00	55.8	73.5	39.5
10/16/2009	16:30:00	50.7	70.8	37.7
10/16/2009	17:00:00	45.1	65.9	37.4
10/16/2009	17:30:00	45.1	58.7	37.0
10/16/2009	18:00:00	39.3	50.9	35.5
10/16/2009	18:30:00	48.4	70.7	36.1
10/16/2009	19:00:00	48.3	62.1	37.7
10/16/2009	19:30:00	52.0	67.7	39.8
10/16/2009	20:00:00	48.5	59.2	39.5
10/16/2009	20:30:00	51.3	59.9	41.4
10/16/2009	21:00:00	51.2	60.3	42.9
10/16/2009	21:30:00	50.3	56.6	44.4
10/16/2009	22:00:00	46.5	56.1	42.5
10/16/2009	22:30:00	46.8	54.9	41.8
10/16/2009	23:00:00	44.8	54.5	41.2
10/16/2009	23:30:00	45.2	53.7	40.3
24 Hour Leq=		54.1		


Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Renewable Energy Project Site
10-16-2009
Sound Pressure Level (dBA)
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
0:00:00
1:00:00
2:00:00
3:00:00
4:00:00
5:00:00
6:00:00
7:00:00
8:00:00
9:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
Military Time
Leq

ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Renewable Energy Project Site

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/17/2009	0:00:00	44.8	57.3	39.7
10/17/2009	0:30:00	44.0	55.7	40.2
10/17/2009	1:00:00	44.8	56.9	39.6
10/17/2009	1:30:00	42.4	49.4	38.9
10/17/2009	2:00:00	43.8	58.5	38.3
10/17/2009	2:30:00	43.5	54.9	39.3
10/17/2009	3:00:00	45.5	56.0	38.6
10/17/2009	3:30:00	43.6	54.5	38.3
10/17/2009	4:00:00	44.7	53.3	38.4
10/17/2009	4:30:00	44.9	55.5	39.6
10/17/2009	5:00:00	44.5	53.4	39.2
10/17/2009	5:30:00	45.7	55.1	40.5
10/17/2009	6:00:00	46.9	55.4	39.4
10/17/2009	6:30:00	49.7	57.7	39.6
10/17/2009	7:00:00	51.1	59.2	41.6
10/17/2009	7:30:00	51.1	59.4	43.1
10/17/2009	8:00:00	52.9	73.6	42.6
10/17/2009	8:30:00	49.7	58.2	42.5
10/17/2009	9:00:00	49.0	60.4	42.2
10/17/2009	9:30:00	51.6	69.5	41.3
10/17/2009	10:00:00	51.5	73.8	35.0
10/17/2009	10:30:00	46.4	63.4	34.1
10/17/2009	11:00:00	47.0	64.4	33.2
10/17/2009	11:30:00	42.9	58.4	32.1
10/17/2009	12:00:00	42.9	61.4	33.7
10/17/2009	12:30:00	46.7	62.3	33.6
10/17/2009	13:00:00	42.3	64.2	33.4
10/17/2009	13:30:00	43.2	66.0	33.1
10/17/2009	14:00:00	43.1	62.0	33.1
10/17/2009	14:30:00	49.4	66.1	32.6
10/17/2009	15:00:00	47.9	64.0	32.4
10/17/2009	15:30:00	44.1	57.5	34.0
10/17/2009	16:00:00	41.6	55.0	33.0
10/17/2009	16:30:00	41.1	60.2	32.1
10/17/2009	17:00:00	47.5	61.9	31.8
10/17/2009	17:30:00	48.5	63.3	35.4
10/17/2009	18:00:00	43.9	59.2	36.3
10/17/2009	18:30:00	44.0	60.0	37.8
10/17/2009	19:00:00	51.2	68.2	39.7
10/17/2009	19:30:00	44.0	51.6	40.0
10/17/2009	20:00:00	45.5	64.1	39.0
10/17/2009	20:30:00	41.1	53.9	37.5
10/17/2009	21:00:00	46.7	66.2	39.1
10/17/2009	21:30:00	43.6	48.6	40.6
10/17/2009	22:00:00	42.1	47.2	38.8
10/17/2009	22:30:00	40.6	45.3	37.5
10/17/2009	23:00:00	41.8	53.4	38.8
10/17/2009	23:30:00	40.9	49.4	38.5
24 Hour Leq=		46.9		

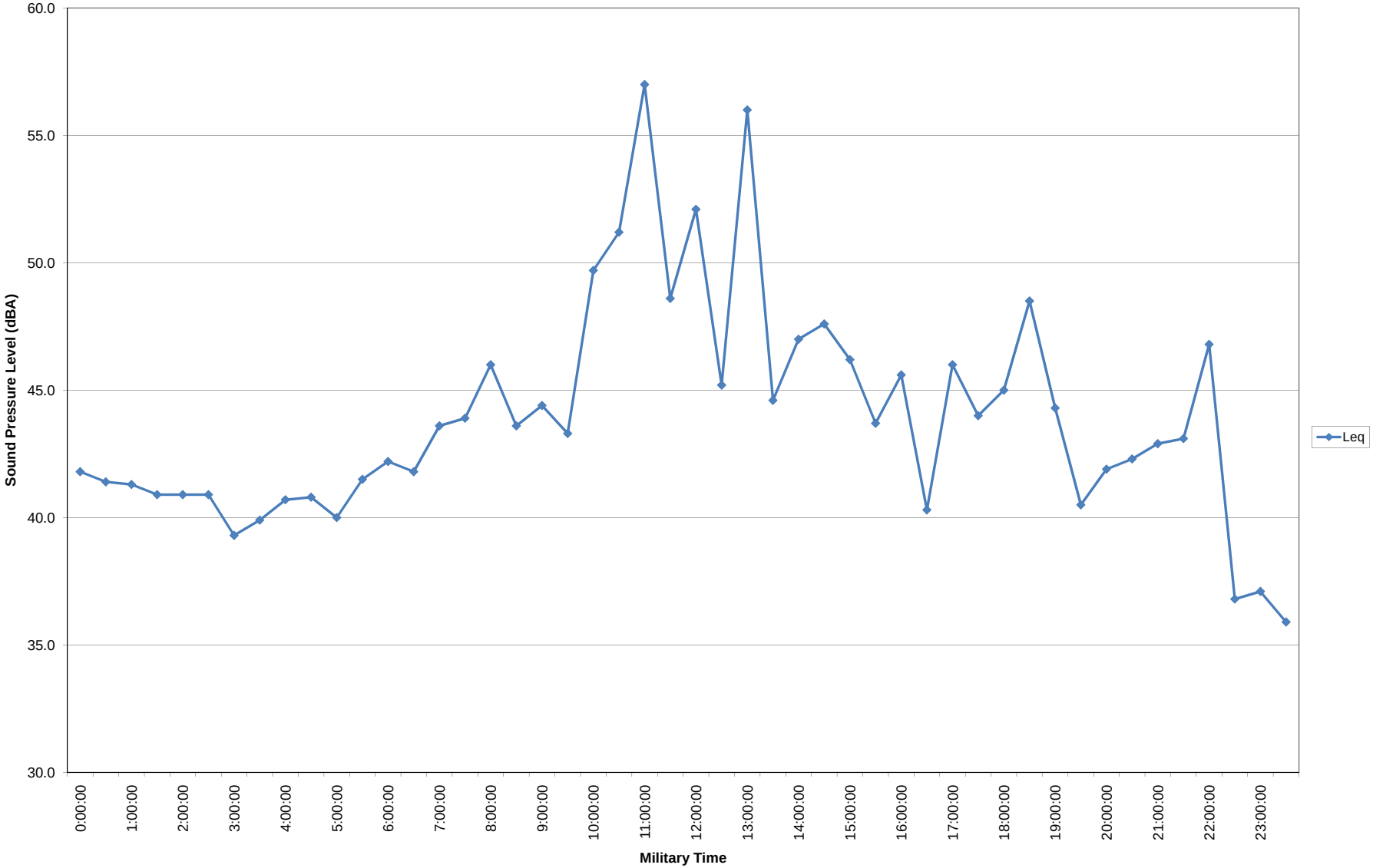

Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Renewable Energy Project Site
10-17-2009
Sound Pressure Level (dBA)
55.0
50.0
45.0
40.0
35.0
30.0
0:00:00
1:00:00
2:00:00
3:00:00
4:00:00
5:00:00
6:00:00
7:00:00
8:00:00
9:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
Military Time
Leq

ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Renewable Energy Project Site

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/18/2009	0:00:00	41.8	51.3	38.4
10/18/2009	0:30:00	41.4	45.4	37.9
10/18/2009	1:00:00	41.3	47.1	37.5
10/18/2009	1:30:00	40.9	48.0	37.2
10/18/2009	2:00:00	40.9	54.1	37.6
10/18/2009	2:30:00	40.9	47.9	36.9
10/18/2009	3:00:00	39.3	46.5	35.4
10/18/2009	3:30:00	39.9	54.4	36.1
10/18/2009	4:00:00	40.7	49.8	36.0
10/18/2009	4:30:00	40.8	48.0	35.8
10/18/2009	5:00:00	40.0	47.7	36.2
10/18/2009	5:30:00	41.5	53.0	35.5
10/18/2009	6:00:00	42.2	50.9	37.1
10/18/2009	6:30:00	41.8	49.2	37.0
10/18/2009	7:00:00	43.6	55.5	36.5
10/18/2009	7:30:00	43.9	53.9	39.2
10/18/2009	8:00:00	46.0	60.5	39.5
10/18/2009	8:30:00	43.6	51.9	40.2
10/18/2009	9:00:00	44.4	59.3	39.9
10/18/2009	9:30:00	43.3	56.5	35.4
10/18/2009	10:00:00	49.7	73.4	34.3
10/18/2009	10:30:00	51.2	70.5	34.6
10/18/2009	11:00:00	57.0	78.6	34.5
10/18/2009	11:30:00	48.6	65.1	35.3
10/18/2009	12:00:00	52.1	74.5	36.0
10/18/2009	12:30:00	45.2	62.3	36.5
10/18/2009	13:00:00	56.0	81.0	36.2
10/18/2009	13:30:00	44.6	66.1	34.9
10/18/2009	14:00:00	47.0	65.3	36.3
10/18/2009	14:30:00	47.6	68.0	35.2
10/18/2009	15:00:00	46.2	65.2	35.6
10/18/2009	15:30:00	43.7	57.3	35.9
10/18/2009	16:00:00	45.6	67.1	34.3
10/18/2009	16:30:00	40.3	54.1	36.4
10/18/2009	17:00:00	46.0	62.4	36.0
10/18/2009	17:30:00	44.0	56.0	36.0
10/18/2009	18:00:00	45.0	56.8	37.5
10/18/2009	18:30:00	48.5	68.6	38.0
10/18/2009	19:00:00	44.3	57.5	39.4
10/18/2009	19:30:00	40.5	50.6	38.0
10/18/2009	20:00:00	41.9	54.3	37.3
10/18/2009	20:30:00	42.3	56.1	37.9
10/18/2009	21:00:00	42.9	53.2	36.7
10/18/2009	21:30:00	43.1	65.1	36.6
10/18/2009	22:00:00	46.8	67.2	35.3
10/18/2009	22:30:00	36.8	49.1	35.0
10/18/2009	23:00:00	37.1	49.2	34.4
10/18/2009	23:30:00	35.9	44.8	34.1
24 Hour Leq=		46.8		

Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Renewable Energy Project Site
10-18-2009

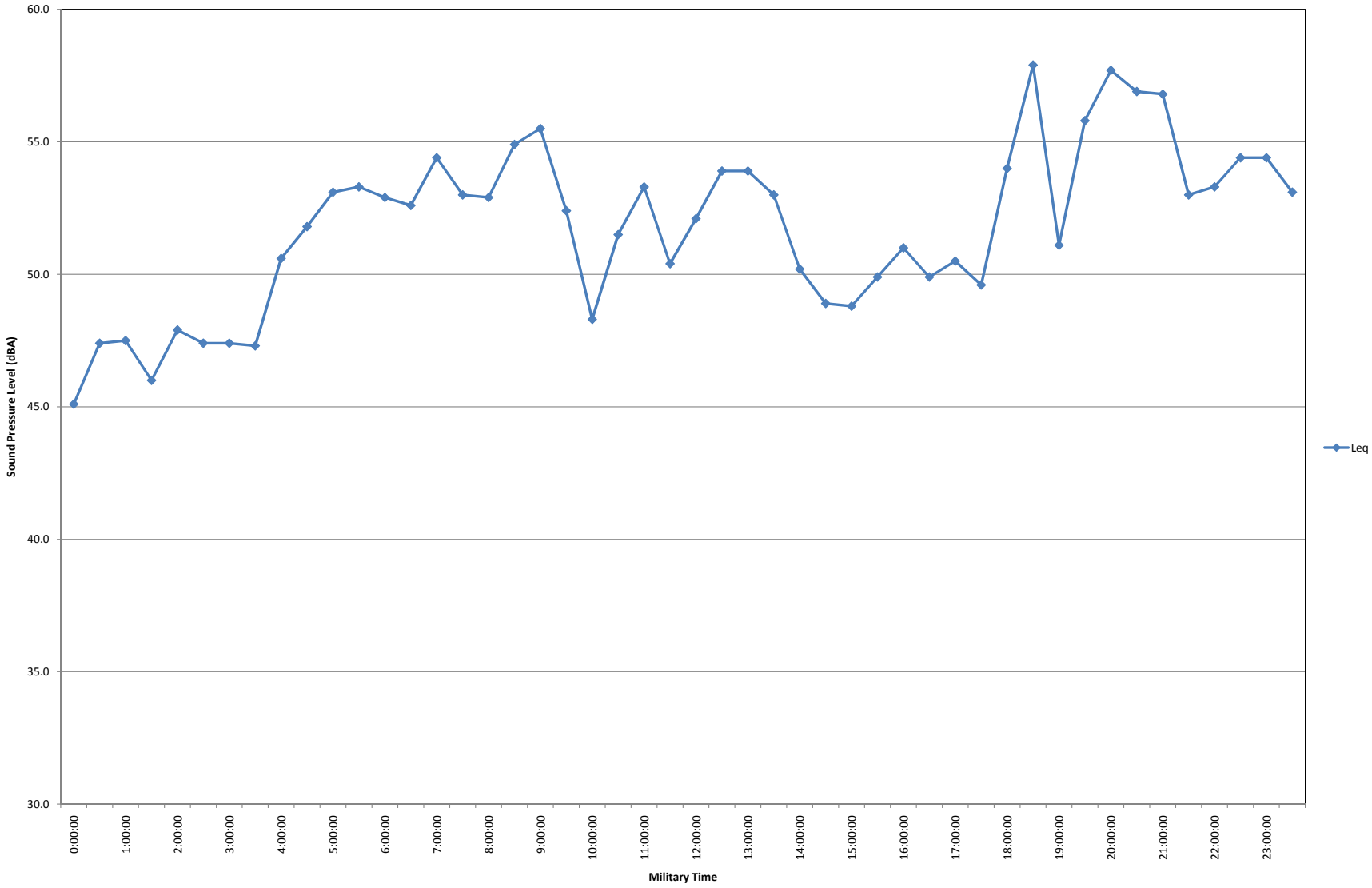


ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Southern Portion of Landfill Property

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/15/2009	0:00:00	45.1	59.6	39.7
10/15/2009	0:30:00	47.4	66.6	41.8
10/15/2009	1:00:00	47.5	59.3	43.2
10/15/2009	1:30:00	46.0	53.3	42.8
10/15/2009	2:00:00	47.9	58.9	43.8
10/15/2009	2:30:00	47.4	56.2	41.7
10/15/2009	3:00:00	47.4	60.2	41.7
10/15/2009	3:30:00	47.3	57.7	44.3
10/15/2009	4:00:00	50.6	58.5	46.2
10/15/2009	4:30:00	51.8	56.3	48.9
10/15/2009	5:00:00	53.1	57.5	50.0
10/15/2009	5:30:00	53.3	56.6	50.6
10/15/2009	6:00:00	52.9	57.0	50.5
10/15/2009	6:30:00	52.6	55.5	49.7
10/15/2009	7:00:00	54.4	64.1	50.6
10/15/2009	7:30:00	53.0	60.6	50.5
10/15/2009	8:00:00	52.9	61.1	50.5
10/15/2009	8:30:00	54.9	63.9	51.3
10/15/2009	9:00:00	55.5	66.1	52.1
10/15/2009	9:30:00	52.4	63.8	48.1
10/15/2009	10:00:00	48.3	53.8	46.0
10/15/2009	10:30:00	51.5	68.5	46.4
10/15/2009	11:00:00	53.3	69.4	46.5
10/15/2009	11:30:00	50.4	65.3	45.4
10/15/2009	12:00:00	52.1	67.3	45.4
10/15/2009	12:30:00	53.9	74.9	45.0
10/15/2009	13:00:00	53.9	75.4	44.2
10/15/2009	13:30:00	53.0	69.2	44.6
10/15/2009	14:00:00	50.2	68.0	44.5
10/15/2009	14:30:00	48.9	64.0	44.1
10/15/2009	15:00:00	48.8	60.4	43.3
10/15/2009	15:30:00	49.9	65.4	45.3
10/15/2009	16:00:00	51.0	67.5	44.5
10/15/2009	16:30:00	49.9	66.7	44.8
10/15/2009	17:00:00	50.5	68.8	45.2
10/15/2009	17:30:00	49.6	61.4	46.1
10/15/2009	18:00:00	54.0	71.1	48.7
10/15/2009	18:30:00	57.9	79.4	46.9
10/15/2009	19:00:00	51.1	61.1	47.0
10/15/2009	19:30:00	55.8	66.5	49.8
10/15/2009	20:00:00	57.7	67.2	50.8
10/15/2009	20:30:00	56.9	69.3	51.4
10/15/2009	21:00:00	56.8	71.2	50.9
10/15/2009	21:30:00	53.0	65.5	49.3
10/15/2009	22:00:00	53.3	61.6	50.3
10/15/2009	22:30:00	54.4	67.6	51.1
10/15/2009	23:00:00	54.4	66.4	50.9
10/15/2009	23:30:00	53.1	62.1	49.7
24 Hour Leq=		52.8		

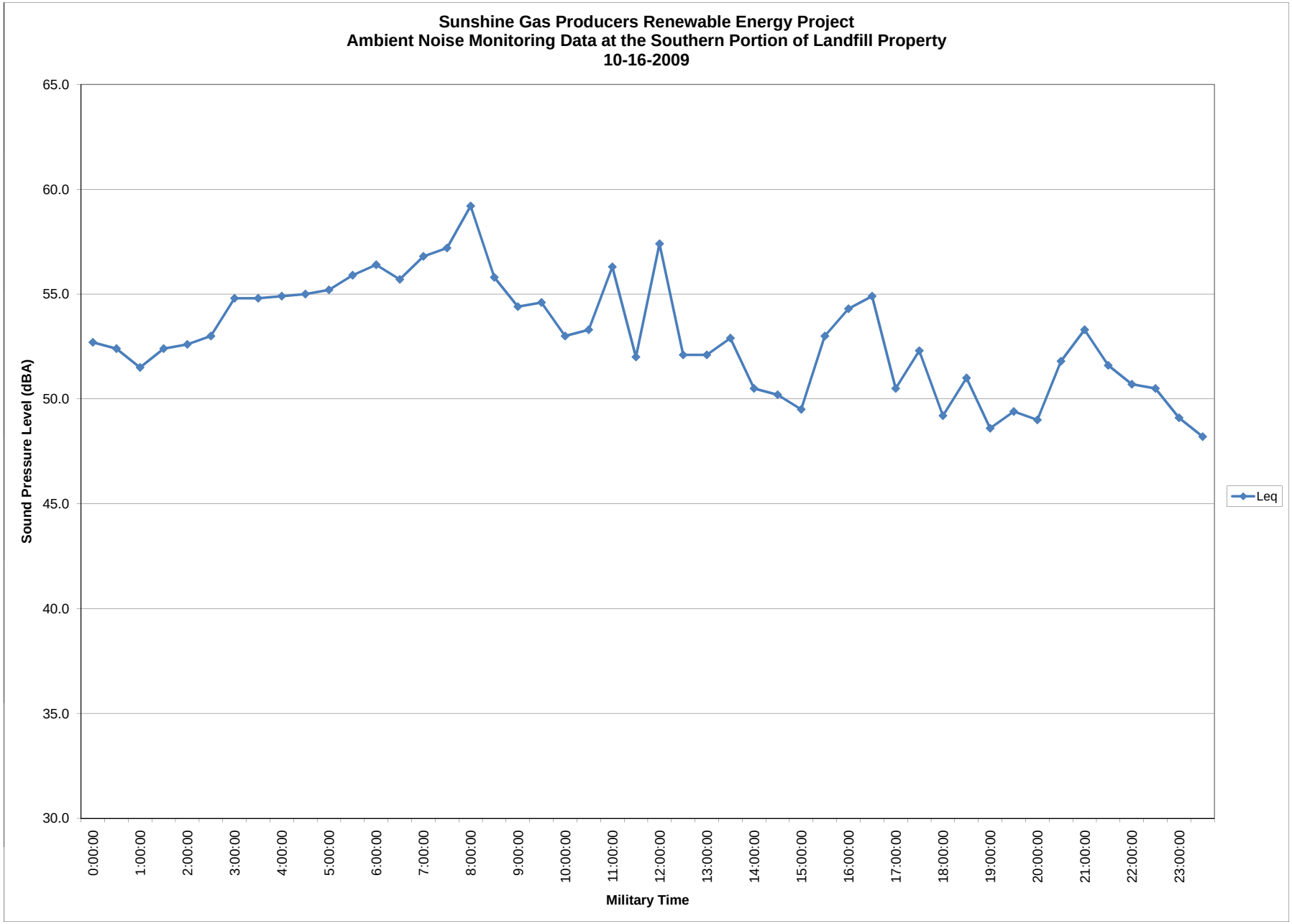
Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Southern Portion of Landfill Property
10-15-2009



ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Southern Portion of Landfill Property

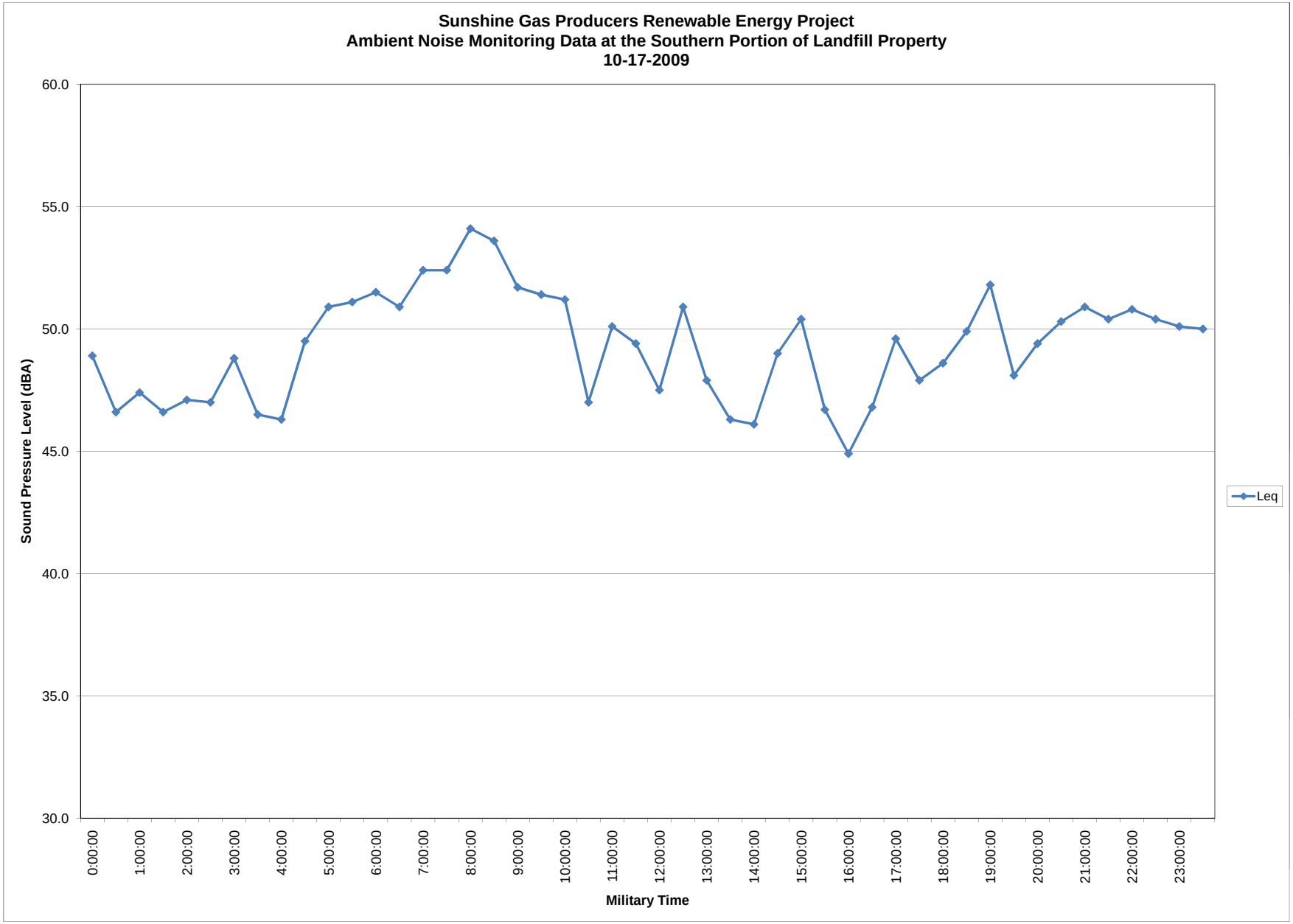
Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/16/2009	0:00:00	52.7	61.2	49.2
10/16/2009	0:30:00	52.4	60.2	49.1
10/16/2009	1:00:00	51.5	58.0	47.9
10/16/2009	1:30:00	52.4	63.0	48.7
10/16/2009	2:00:00	52.6	57.5	49.0
10/16/2009	2:30:00	53.0	61.5	49.2
10/16/2009	3:00:00	54.8	68.5	50.9
10/16/2009	3:30:00	54.8	63.5	51.3
10/16/2009	4:00:00	54.9	62.0	51.8
10/16/2009	4:30:00	55.0	60.7	52.5
10/16/2009	5:00:00	55.2	60.9	52.4
10/16/2009	5:30:00	55.9	64.6	53.1
10/16/2009	6:00:00	56.4	65.9	53.7
10/16/2009	6:30:00	55.7	62.2	53.2
10/16/2009	7:00:00	56.8	66.9	53.2
10/16/2009	7:30:00	57.2	67.8	53.1
10/16/2009	8:00:00	59.2	78.2	52.8
10/16/2009	8:30:00	55.8	66.1	52.5
10/16/2009	9:00:00	54.4	64.1	51.6
10/16/2009	9:30:00	54.6	67.6	50.9
10/16/2009	10:00:00	53.0	63.4	49.8
10/16/2009	10:30:00	53.3	63.3	48.3
10/16/2009	11:00:00	56.3	77.2	48.2
10/16/2009	11:30:00	52.0	62.9	48.0
10/16/2009	12:00:00	57.4	77.8	47.5
10/16/2009	12:30:00	52.1	68.8	47.1
10/16/2009	13:00:00	52.1	66.2	47.3
10/16/2009	13:30:00	52.9	81.7	46.6
10/16/2009	14:00:00	50.5	66.5	45.4
10/16/2009	14:30:00	50.2	62.6	45.1
10/16/2009	15:00:00	49.5	57.9	45.9
10/16/2009	15:30:00	53.0	66.1	46.4
10/16/2009	16:00:00	54.3	76.2	47.1
10/16/2009	16:30:00	54.9	74.2	47.0
10/16/2009	17:00:00	50.5	63.9	46.3
10/16/2009	17:30:00	52.3	77.4	46.9
10/16/2009	18:00:00	49.2	56.6	46.2
10/16/2009	18:30:00	51.0	63.4	47.3
10/16/2009	19:00:00	48.6	61.5	43.4
10/16/2009	19:30:00	49.4	66.0	42.8
10/16/2009	20:00:00	49.0	64.4	45.0
10/16/2009	20:30:00	51.8	66.4	47.4
10/16/2009	21:00:00	53.3	68.1	49.9
10/16/2009	21:30:00	51.6	56.1	48.6
10/16/2009	22:00:00	50.7	64.3	47.6
10/16/2009	22:30:00	50.5	63.2	46.6
10/16/2009	23:00:00	49.1	53.3	46.8
10/16/2009	23:30:00	48.2	51.8	45.7
24 Hour Leq=		53.7		


Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Southern Portion of Landfill Property
10-16-2009
Sound Pressure Level (dBA)
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
0:00:00
1:00:00
2:00:00
3:00:00
4:00:00
5:00:00
6:00:00
7:00:00
8:00:00
9:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
Military Time
Leq

ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Southern Portion of Landfill Property

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/17/2009	0:00:00	48.9	64.6	45.6
10/17/2009	0:30:00	46.6	55.1	43.7
10/17/2009	1:00:00	47.4	62.5	43.3
10/17/2009	1:30:00	46.6	64.8	42.4
10/17/2009	2:00:00	47.1	62.9	43.3
10/17/2009	2:30:00	47.0	64.1	43.3
10/17/2009	3:00:00	48.8	64.5	43.4
10/17/2009	3:30:00	46.5	53.3	43.8
10/17/2009	4:00:00	46.3	50.3	43.5
10/17/2009	4:30:00	49.5	62.9	45.9
10/17/2009	5:00:00	50.9	64.5	46.1
10/17/2009	5:30:00	51.1	59.0	47.4
10/17/2009	6:00:00	51.5	64.0	47.7
10/17/2009	6:30:00	50.9	55.9	48.0
10/17/2009	7:00:00	52.4	59.7	48.7
10/17/2009	7:30:00	52.4	65.2	49.6
10/17/2009	8:00:00	54.1	69.2	49.7
10/17/2009	8:30:00	53.6	65.5	49.4
10/17/2009	9:00:00	51.7	58.1	48.3
10/17/2009	9:30:00	51.4	64.8	47.2
10/17/2009	10:00:00	51.2	66.4	41.2
10/17/2009	10:30:00	47.0	67.9	39.5
10/17/2009	11:00:00	50.1	69.6	38.9
10/17/2009	11:30:00	49.4	66.4	40.6
10/17/2009	12:00:00	47.5	62.9	42.9
10/17/2009	12:30:00	50.9	67.6	43.4
10/17/2009	13:00:00	47.9	63.3	41.1
10/17/2009	13:30:00	46.3	56.3	41.9
10/17/2009	14:00:00	46.1	57.4	41.4
10/17/2009	14:30:00	49.0	63.2	40.8
10/17/2009	15:00:00	50.4	64.6	39.0
10/17/2009	15:30:00	46.7	61.7	39.4
10/17/2009	16:00:00	44.9	54.1	38.9
10/17/2009	16:30:00	46.8	63.4	38.1
10/17/2009	17:00:00	49.6	67.5	37.6
10/17/2009	17:30:00	47.9	65.1	37.9
10/17/2009	18:00:00	48.6	65.0	40.5
10/17/2009	18:30:00	49.9	64.9	43.8
10/17/2009	19:00:00	51.8	66.9	44.8
10/17/2009	19:30:00	48.1	62.6	44.0
10/17/2009	20:00:00	49.4	61.7	44.4
10/17/2009	20:30:00	50.3	64.8	44.7
10/17/2009	21:00:00	50.9	64.1	46.4
10/17/2009	21:30:00	50.4	58.8	47.2
10/17/2009	22:00:00	50.8	60.9	47.2
10/17/2009	22:30:00	50.4	63.9	47.3
10/17/2009	23:00:00	50.1	60.3	46.9
10/17/2009	23:30:00	50.0	64.6	44.9
24 Hour Leq=		49.8		

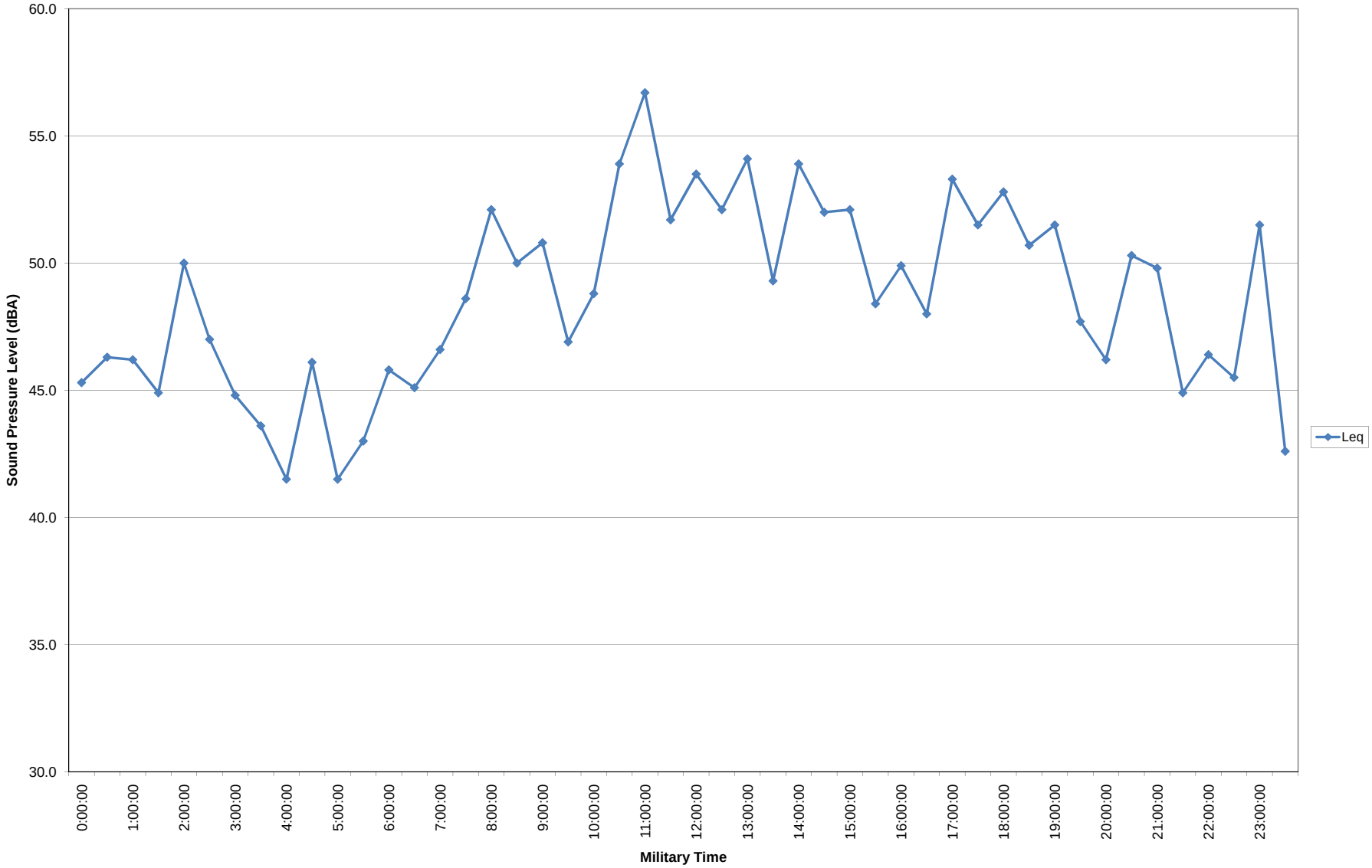

Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Southern Portion of Landfill Property
10-17-2009
Sound Pressure Level (dBA)
60.0
55.0
50.0
45.0
40.0
35.0
30.0
0:00:00
1:00:00
2:00:00
3:00:00
4:00:00
5:00:00
6:00:00
7:00:00
8:00:00
9:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
Military Time
Leq

ARCADIS
Infrastructure, environment, buildings

Project: Sunshine Gas Producers Renewable Energy Project
Project Number: 002-10498-00
Location: Southern Portion of Landfill Property

Date	Military Time	Leq dBA	Lmax dBA	Lmin dBA
10/18/2009	0:00:00	45.3	48.8	43.0
10/18/2009	0:30:00	46.3	57.7	41.6
10/18/2009	1:00:00	46.2	50.3	42.0
10/18/2009	1:30:00	44.9	52.2	41.1
10/18/2009	2:00:00	50.0	71.3	40.7
10/18/2009	2:30:00	47.0	66.0	40.9
10/18/2009	3:00:00	44.8	50.7	41.9
10/18/2009	3:30:00	43.6	60.4	38.3
10/18/2009	4:00:00	41.5	50.3	37.7
10/18/2009	4:30:00	46.1	63.3	39.1
10/18/2009	5:00:00	41.5	57.8	37.9
10/18/2009	5:30:00	43.0	58.3	37.7
10/18/2009	6:00:00	45.8	63.1	40.2
10/18/2009	6:30:00	45.1	53.6	41.5
10/18/2009	7:00:00	46.6	60.7	41.5
10/18/2009	7:30:00	48.6	64.7	42.6
10/18/2009	8:00:00	52.1	70.1	45.0
10/18/2009	8:30:00	50.0	64.0	44.9
10/18/2009	9:00:00	50.8	66.4	43.9
10/18/2009	9:30:00	46.9	57.7	42.2
10/18/2009	10:00:00	48.8	63.1	41.6
10/18/2009	10:30:00	53.9	72.1	42.5
10/18/2009	11:00:00	56.7	76.1	41.7
10/18/2009	11:30:00	51.7	65.9	42.8
10/18/2009	12:00:00	53.5	73.7	43.1
10/18/2009	12:30:00	52.1	73.0	43.0
10/18/2009	13:00:00	54.1	74.5	42.3
10/18/2009	13:30:00	49.3	61.7	43.0
10/18/2009	14:00:00	53.9	73.3	43.6
10/18/2009	14:30:00	52.0	69.1	43.6
10/18/2009	15:00:00	52.1	70.1	44.1
10/18/2009	15:30:00	48.4	59.2	43.8
10/18/2009	16:00:00	49.9	62.2	43.5
10/18/2009	16:30:00	48.0	65.6	43.1
10/18/2009	17:00:00	53.3	68.8	44.1
10/18/2009	17:30:00	51.5	65.1	44.3
10/18/2009	18:00:00	52.8	66.8	45.1
10/18/2009	18:30:00	50.7	67.0	44.1
10/18/2009	19:00:00	51.5	67.5	44.0
10/18/2009	19:30:00	47.7	63.8	43.0
10/18/2009	20:00:00	46.2	56.3	43.0
10/18/2009	20:30:00	50.3	66.8	42.5
10/18/2009	21:00:00	49.8	67.7	43.3
10/18/2009	21:30:00	44.9	55.7	40.4
10/18/2009	22:00:00	46.4	64.7	40.9
10/18/2009	22:30:00	45.5	57.6	41.4
10/18/2009	23:00:00	51.5	74.1	40.9
10/18/2009	23:30:00	42.6	56.4	38.4
24 Hour Leq=		50.1		

Sunshine Gas Producers Renewable Energy Project
Ambient Noise Monitoring Data at the Southern Portion of Landfill Property
10-18-2009



2 Project Facility Noise Emission Data

ENCLOSURE SYSTEM

Package Enclosure

Type	Complete Package Enclosure
Sound Attenuation	Average 85 dBA at 3ft (1m) from the enclosure, at a height of 5 ft (1.5 m), when installed in a free-field

Enclosure Ventilation Fan

Type	AC Motor-Driven
Motor Power	15 kW (20 hp), 3-Phase
Space Heater	None

Enclosure Lights

Type	AC, Incandescent
Power	800 W (200 W per fixture), 1-Phase

3 Project Facility Noise Impact Calculations

Project Site Operational Noise Sources

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li	
			Day	Evening	Night	Day	Evening	Night	Type	Value
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)		
flare			109.9	109.9	109.9	101.0	101.0	101.0	Lw"	flare
turbine			99.3	99.3	99.3	96.0	96.0	96.0	Lw"	turbine
turbine			99.2	99.2	99.2	96.0	96.0	96.0	Lw"	turbine
turbine			99.3	99.3	99.3	96.0	96.0	96.0	Lw"	turbine
turbine			99.2	99.2	99.2	96.0	96.0	96.0	Lw"	turbine
turbine			99.2	99.2	99.2	96.0	96.0	96.0	Lw"	turbine
compressor			113.5	113.5	113.5	106.0	106.0	106.0	Lw"	compressor
compressor			112.5	112.5	112.5	106.0	106.0	106.0	Lw"	compressor
compressor			112.2	112.2	112.2	106.0	106.0	106.0	Lw"	compressor
compressor			112.4	112.4	112.4	106.0	106.0	106.0	Lw"	compressor
compressor			112.7	112.7	112.7	106.0	106.0	106.0	Lw"	compressor
compressor			112.3	112.3	112.3	106.0	106.0	106.0	Lw"	compressor
compressor			112.5	112.5	112.5	106.0	106.0	106.0	Lw"	compressor
compressor			112.3	112.3	112.3	106.0	106.0	106.0	Lw"	compressor
chiller			105.8	105.8	105.8	101.0	101.0	101.0	Lw"	chiller
chiller			105.9	105.9	105.9	101.0	101.0	101.0	Lw"	chiller
chiller			113.0	113.0	113.0	101.0	101.0	101.0	Lw"	chiller
chiller			111.1	111.1	111.1	101.0	101.0	101.0	Lw"	chiller
chiller			113.8	113.8	113.8	101.0	101.0	101.0	Lw"	chiller
chiller			113.9	113.9	113.9	101.0	101.0	101.0	Lw"	chiller
chiller			113.8	113.8	113.8	101.0	101.0	101.0	Lw"	chiller

Project Traffic Noise Sources

Name	M.	ID	Lme	exact Count Data						Speed
			Day	M			p (%)			Auto
			(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)
San Fernando			56.1	16.0	0.0	0.0	80.0	0.0	20.0	56
Landfill			47.7	16.0	0.0	0.0	22.0	0.0	20.0	16
project site			49.1	16.0	0.0	0.0	32.0	0.0	20.0	16

Operational Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
project site			48.6	48.5	0.0	0.0		x	Total	1.52	r	1952684.82	592868.48	596.91
Admin building			43.2	27.2	0.0	0.0		x	Total	1.52	r	1952706.15	592151.93	525.91
southern property			24.1	-30.6	0.0	0.0		x	Total	1.52	r	1953991.14	590860.76	489.71
Northern Property			21.3	21.3	0.0	0.0		x	Total	1.52	r	1951475.18	593409.37	568.77
Residential Receiver			47.2	34.5	0.0	0.0		x	Total	1.52	r	1954193.17	591682.49	411.57

4 Construction Noise Emission Data

9.0 CONSTRUCTION EQUIPMENT NOISE LEVELS AND RANGES

9.1 Equipment Type Inventory and Related Emission Levels

Noise levels generated by individual pieces of construction equipment and specific construction operations form the basis for the prediction of construction-related noise levels. A variety of information exists related to sound emissions related to such equipment and operations. This data transcends the period beginning in the 1970s thru 2006. This information exists for both stationary and mobile sources and for steady, intermittent, and impulse type generators of noise.

9.1.1 Stationary Equipment

Stationary equipment consists of equipment that generates noise from one general area and includes items such as pumps, generators, compressors, etc. These types of equipment operate at a constant noise level under normal operation and are classified as non-impact equipment. Other types of stationary equipment such as pile drivers, jackhammers, pavement breakers, blasting operations, etc., produce variable and sporadic noise levels and often produce impact-type noises. Impact equipment is equipment that generates impulsive noise, where impulsive noise is defined as noise of short duration (generally less than one second), high intensity, abrupt onset, rapid decay, and often rapidly changing spectral composition. For impact equipment, the noise is produced by the impact of a mass on a surface, typically repeating over time.

9.1.2 Mobile Equipment

Mobile equipment such as dozers, scrapers, graders, etc., may operate in a cyclic fashion in which a period of full power is followed by a period of reduced power. Other equipment such as compressors, although generally considered to be stationary when operating, can be readily relocated to another location for the next operation.

9.2 Sources of Information

Construction-related equipment and operation noise level data may be provided by numerous sources, including suppliers, manufacturers, agencies, organizations, etc. Some information is included in this document, and many web-based links are given for equipment manufacturers.

9.3 Specifics of Construction Equipment and Operation Noise Inventories

Details included in each specific inventory of construction equipment and operation noise emission levels are often variable in terms of how data is represented. Some inventories include ranges of noise levels while others present single numbers for each equipment type. Others provide levels for specific models of each type of construction equipment. Often, different noise descriptors are used, such as L_{Aeq}, L_{max}, L_{10}, sound power level, etc. As such, the array of data does not readily lend itself to being combined into a single table or easily compared. As such, this Handbook attempts to summarize a variety of such inventories and provide links to each, thereby providing the reader with a variety of sources from which to choose the appropriate levels for use in his or her respective analysis.

9.4 Summaries of Referenced Inventories

Included below are examples of several inventories of construction-related noise emission values. These and additional inventories are included on the companion CD-ROM.

9.4.1 RCNM Inventory

Equipment and operation noise levels in this inventory are expressed in terms of L_{max} noise levels and are accompanied by a usage factor value. They have been recently updated and are based on extensive measurements taken in conjunction with the Central Artery/Tunnel (CA/T) Project. Table 9.1 summarizes the equipment noise emissions database used by the CA/T Project. While these values represent the "default" values for use in the RCNM, user-defined equipment and corresponding noise levels can be added.

Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors.

Equipment Description	Impact Device?	Acoustical Usage Factor (%)	Spec. 721.560 L_{max} @ 50 feet (dBA, slow)	Actual Measured L_{max} @ 50 feet (dBA, slow) (Samples Averaged)	Number of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	N/A	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	N/A	0
Blasting	Yes	N/A	94	N/A	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	N/A	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS Signs)	No	50	70	73	74
Gradall	No	40	85	83	70

Grader	No	40	85	N/A	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydraulic Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	N/A	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarifier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/Chipping Gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (single nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Sheers (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	N/A	0
Tractor	No	40	84	N/A	0
Vacuum Excavator (Vac-Truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44

Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

For each generic type of equipment listed in Table 9.1, the following information is provided:

- an indication as to whether or not the equipment is an impact device;
- the acoustical usage factor to assume for modeling purposes;
- the specification "Spec" limit for each piece of equipment expressed as an L_{max} level in dBA "slow" at a reference distance of 50 foot from the loudest side of the equipment;
- the measured "Actual" emission level at 50 feet for each piece of equipment based on hundreds of emission measurements performed on CA/T work sites; and
- the number of samples that were averaged together to compute the "Actual" emission level.

A comparison of the "Spec" emission limits against the "Actual" emission levels reveals that the Spec limits were set, in general, to realistically obtainable noise levels based on the equipment used by contractors on the CA/T Project. When measured in the field, some equipment such as pile drivers, sand blasting, demolition shears, and pumps tended to exceed their applicable emission limit. As such, these noisy devices needed to have some form of noise mitigation in place in order to comply with the Spec emission limits. Other equipment, such as clamshell shovels, concrete mixer trucks, truck-mounted drill rigs, man-lifts, chipping guns, ventilation fans, pavers, dump trucks, and flatbed trucks, easily complied. Therefore, the Spec emission limits for these devices could have been reduced somewhat further. It is recommended that the user review the RCNM User's Guide contained in Appendix A for detailed guidance regarding application of values contained in Table 9.1.

9.4.2 FHWA Special Report Inventories

Appendix A of the 1977 Handbook provides tables of construction equipment noise levels and ranges. The majority of the data were provided by the American Road Builders Association. These data were taken during a 1973 survey in which member contractors were asked to secure readings of noise exposure to operators of various types of equipment. Additionally, the contractors were asked to take readings at 50 feet from the machinery. These 50-foot peak readings are provided in Tables 9.2 through 9.8. Though the data were produced under varying conditions and degrees of expertise, the values are relatively consistent.

Table 9.2 Construction Equipment Noise Levels Based on Limited Data Samples - Cranes.

Manufacturer	Type or Model	Peak Noise Level (dBA)	Remarks
Northwestern	80D	77	Within 15m 1958 mod
Northwestern	8	84	Within 15m 1940 mod
Northwestern	6	72	Within 15m 1965 mod
American	7260	82	Within 15m 1967 mod
American	599	76	Within 15m 1969 mod
American	5299	70	Within 15m 1972 mod
American	4210	82	Within 15m 1968 mod
Buck Eye	45C	79	Within 15m 1972 mod
Buck Eye	308	74	Within 15m 1968 mod
Buck Eye	30B	73	Within 15m 1965 mod
Buck Eye	30B	70	Within 15m 1959 mod
Link Belt	LS98	76	Within 15m 1956 mod
Manitowoc	4000	94	Within 15m 1956 mod

5 Construction Noise Impact Calculations

Phase 1 Construction Noise Sources

Name	M.	ID	Result. PWL			Lw / Li		Correc	Operating Time			K0	Freq.	Direct.	Height		Coordinates	
			Day	Evening	Night	Type	Value	Night	Day	Special	Night						X	Y
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)
Excavator			119.7	119.7	119.7	Lw	excavator	0.0	36.00	0.00	0.00	0.0	1000	(none)	4.00	r	1952748.70	592926.96

Phase 1 Construction Noise Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li		Operating Time			K0	Freq.	Direct.
			Day	Evening	Night	Day	Evening	Night	Type	Value	Day	Special	Night			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(dB)	(Hz)	
Bull Dozer			113.3	1.6	1.6	91.9	-19.9	-19.9	PWL-Pt	bulldozer	24.00	0.00	0.00	0.0	1000	(none)

Phase 1 Construction Roadways

Name	M.	ID	Lme			exact Count Data						Speed Limit		SCS	Surface	
			Day	Evening	Night	M			p (%)			Auto	Truck	Dist.	Dstro	Type
			(dBA)	(dBA)	(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)	
I-5			0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	20.0	104		0.0	0.0	1
San Fernando			63.5	-5.8	-2.8	90.0	0.0	0.0	78.0	0.0	20.0	56		0.0	0.0	1
Landfill			60.1	-8.8	-6.2	90.0	0.0	0.0	78.0	0.0	20.0	16		0.0	0.0	9
I-5			60.1	-8.8	-6.2	90.0	0.0	0.0	78.0	0.0	20.0	16		0.0	0.0	9

Phase 1 Construction Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
project site			48.3	-23.0	0.0	0.0		x	Total	1.52	r	1952684.82	592868.48	596.91
Admin building			55.4	-10.8	0.0	0.0		x	Total	1.52	r	1952706.15	592151.93	525.91
southern property			31.6	-30.6	0.0	0.0		x	Total	1.52	r	1953991.14	590860.76	489.71
Northern Property			15.4	-22.0	0.0	0.0		x	Total	1.52	r	1951475.18	593409.37	568.77
Residential Receiver			55.7	-5.9	0.0	0.0		x	Total	1.52	r	1954193.17	591682.49	411.57

Phase 2 Construction Noise Sources

Name	M.	ID	Result. PWL			Lw / Li		Operatir	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	Day					X	Y	Z
			(dBA)	(dBA)	(dBA)			(min)	(Hz)		(m)		(m)	(m)	(m)
Dump Truck			118.7	118.7	118.7	Lw	heavytruck	48.00	1000	(none)	3.66	r	1952752.83	592947.98	569.70
Dump Truck			118.7	118.7	118.7	Lw	heavytruck	48.00	1000	(none)	3.66	r	1952715.08	592935.04	580.54
Dump Truck			118.7	118.7	118.7	Lw	heavytruck	48.00	1000	(none)	3.66	r	1952739.46	592933.49	573.58
Sheep Foot Compactor			117.7	117.7	117.7	Lw	compactor	48.00	1000	(none)	3.66	r	1952708.15	592939.75	579.70
Water Truck			118.7	118.7	118.7	Lw	heavytruck	48.00	1000	(none)	3.66	r	1952721.89	592956.15	572.68

Phase 2 Construction Noise Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li		Operating Time			K0	Freq.
			Day	Evening	Night	Day	Evening	Night	Type	Value	Day	Special	Night		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(dB)	(Hz)
Excavator			117.7	5.9	5.9	91.9	-19.9	-19.9	PWL-Pt	excavator	48.00	0.00	0.00	0.0	1000
Bull Dozer			113.3	1.6	1.6	91.9	-19.9	-19.9	PWL-Pt	bulldozer	48.00	0.00	0.00	0.0	1000

Phase 2 Construction Roadways

Name	M.	ID	Lme			exact Count Data						Speed
			Day	Evening	Night	M			p (%)			Auto
			(dBA)	(dBA)	(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)
I-5			0.2	0.4	0.1	0.0	0.0	0.0	10.5	0.0	20.0	104
San Fernando			44.5	-5.8	-2.8	20.0	0.0	0.0	0.0	0.0	20.0	56
Landfill			41.6	-8.8	-6.2	20.0	0.0	0.0	0.0	0.0	20.0	16
I-5			43.3	-8.8	-6.2	30.0	0.0	0.0	0.0	0.0	20.0	16

Phase 2 Construction Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
project site			55.1	-23.0	0.0	0.0		x	Total	1.52	r	1952684.82	592868.48	596.91
Admin building			38.0	-10.8	0.0	0.0		x	Total	1.52	r	1952706.15	592151.93	525.91
southern property			12.7	-30.6	0.0	0.0		x	Total	1.52	r	1953991.14	590860.76	489.71
Northern Property			22.0	-22.0	0.0	0.0		x	Total	1.52	r	1951475.18	593409.37	568.77
Residential Receiver			39.2	-5.9	0.0	0.0		x	Total	1.52	r	1954193.17	591682.49	411.57

Phase 3 Construction Noise Sources

Name	M.	ID	Result. PWL			Lw / Li		Operatir	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	Day					X	Y	Z
			(dBA)	(dBA)	(dBA)			(min)	(Hz)		(m)		(m)	(m)	(m)
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952715.08	592954.25	576.32
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952664.67	592987.05	576.72
Loader			114.7	114.7	114.7	Lw	loader	36.00	1000	(none)	3.66	r	1952708.03	592960.90	575.84
Pick up			89.7	89.7	89.7	Lw	pickup	24.00	1000	(none)	3.66	r	1952721.14	592962.08	572.12
Pick up			89.7	89.7	89.7	Lw	pickup	60.00	1000	(none)	3.66	r	1953055.21	592819.79	553.79
Pick up			89.7	89.7	89.7	Lw	pickup	60.00	1000	(none)	3.66	r	1952813.87	592896.26	562.64
Grader			119.7	119.7	119.7	Lw	excavator	30.00	1000	(none)	3.66	r	1953318.04	592766.67	595.27
Grader			119.7	119.7	119.7	Lw	excavator	30.00	1000	(none)	3.66	r	1953154.70	592764.66	550.03
concrete truck			119.7	119.7	119.7	Lw	contruck	60.00	1000	(none)	3.66	r	1952945.18	592878.32	559.67
concrete pump			116.7	116.7	116.7	Lw	conpump	60.00	1000	(none)	3.66	r	1952936.29	592871.55	559.62
crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1952936.29	592877.90	559.81
crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1953022.68	592841.48	555.64
crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1953094.67	592800.40	551.37
back hoe			114.7	114.7	114.7	Lw	backhoe	60.00	1000	(none)	3.66	r	1953032.84	592835.97	555.31
back hoe			114.7	114.7	114.7	Lw	backhoe	60.00	1000	(none)	3.66	r	1953228.16	592710.02	548.60
drill rig			119.7	119.7	119.7	Lw	drillrig	60.00	1000	(none)	3.66	r	1953146.98	592756.68	545.16

Phase 3 Construction Noise Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li		Operating Time			K0	Freq.
			Day	Evening	Night	Day	Evening	Night	Type	Value	Day	Special	Night		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(dB)	(Hz)
Excavator			117.7	5.9	5.9	91.9	-19.9	-19.9	PWL-Pt	excavator	36.00	0.00	0.00	0.0	1000
Backhoe			108.3	-3.4	-3.4	86.9	-24.9	-24.9	PWL-Pt	backhoe	36.00	0.00	0.00	0.0	1000
Crawler Crane			113.4	1.6	1.6	91.9	-19.9	-19.9	PWL-Pt	tcrane	36.00	0.00	0.00	0.0	1000
Water Truck			116.3	4.5	4.5	90.9	-20.9	-20.9	PWL-Pt	watertruck	24.00	0.00	0.00	0.0	1000
scraper			113.3	1.5	1.5	91.9	-19.9	-19.9	PWL-Pt	scraper	36.00	0.00	0.00	0.0	1000
water truck			118.6	6.9	6.9	90.9	-20.9	-20.9	PWL-Pt	watertruck	60.00	0.00	0.00	0.0	1000
Dozer			119.7	7.9	7.9	91.9	-19.9	-19.9	PWL-Pt	dozer	60.00	0.00	0.00	0.0	1000

Phase 3 Construction Roadways

Name	M.	ID	Lme			exact Count Data						Speed
			Day	Evening	Night	M			p (%)			Auto
			(dBA)	(dBA)	(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)
I-5			0.2	0.4	0.1	0.0	0.0	0.0	10.5	0.0	20.0	104
San Fernando			61.3	-5.8	-2.8	120.0	0.0	0.0	33.0	0.0	20.0	56
Landfill			57.9	-8.8	-6.2	120.0	0.0	0.0	33.0	0.0	20.0	16
I-5			57.9	-8.8	-6.2	120.0	0.0	0.0	33.0	0.0	20.0	16

Phase 3 Construction Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
project site			64.8	-23.0	0.0	0.0		x	Total	1.52	r	1952684.82	592868.48	596.91
Admin building			57.3	-10.8	0.0	0.0		x	Total	1.52	r	1952706.15	592151.93	525.91
southern property			29.5	-30.6	0.0	0.0		x	Total	1.52	r	1953991.14	590860.76	489.71
Northern Property			24.1	-22.0	0.0	0.0		x	Total	1.52	r	1951471.66	593409.10	568.64
Residential Receiver			53.6	-5.9	0.0	0.0		x	Total	1.52	r	1954193.17	591682.49	411.57

Phase 4 Construction Noise Sources

Name	M.	ID	Result. PWL			Lw / Li		Operatir	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	Day					X	Y	Z
			(dBA)	(dBA)	(dBA)			(min)	(Hz)		(m)		(m)	(m)	(m)
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952715.08	592954.25	576.32
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952664.67	592987.05	576.72
pick-up			89.7	89.7	89.7	Lw	pickup	12.00	1000	(none)	3.66	r	1952721.12	592960.99	572.08
pick up			89.7	89.7	89.7	Lw	pickup	12.00	1000	(none)	3.66	r	1952777.70	592904.97	566.22
forklift			119.7	119.7	119.7	Lw	forklift	36.00	1000	(none)	3.66	r	1952708.32	592959.12	576.25
Low Bed Truck			118.7	118.7	118.7	Lw	bedtruck	24.00	1000	(none)	3.66	r	1952735.79	592959.39	571.22
Flat Bed Truck			118.7	118.7	118.7	Lw	bedtruck	36.00	1000	(none)	3.66	r	1952729.39	592948.45	571.99
crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1952946.18	592876.81	559.60
crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1953031.55	592838.93	555.47
crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1953104.11	592798.38	551.35
concrete pump			116.7	116.7	116.7	Lw	conpump	60.00	1000	(none)	3.66	r	1953024.05	592842.48	555.71
concrete truck			119.7	119.7	119.7	Lw	contruck	60.00	1000	(none)	3.66	r	1953021.37	592837.44	555.44
drill rig			119.7	119.7	119.7	Lw	drillrig	60.00	1000	(none)	3.66	r	1953154.46	592766.19	550.94
backhoe			114.7	114.7	114.7	Lw	backhoe	60.00	1000	(none)	3.66	r	1953094.30	592792.07	551.10
backhoe			114.7	114.7	114.7	Lw	backhoe	60.00	1000	(none)	3.66	r	1953150.77	592755.77	544.77
pick-up			89.7	89.7	89.7	Lw	pickup	60.00	1000	(none)	3.66	r	1952813.65	592896.59	562.66
pick-up			89.7	89.7	89.7	Lw	pickup	60.00	1000	(none)	3.66	r	1952824.41	592883.15	562.70
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952848.94	592889.20	561.72
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952856.67	592887.52	562.22
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952863.73	592887.86	564.89
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952874.15	592887.18	562.77
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952888.94	592885.50	566.92
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952898.69	592883.15	567.75

Phase 4 Construction Roadways

Name	M.	ID	Lme			exact Count Data						Speed
			Day	Evening	Night	M			p (%)			Auto
			(dBA)	(dBA)	(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)
I-5			0.2	0.4	0.1	0.0	0.0	0.0	10.5	0.0	20.0	104
San Fernando			47.5	-5.8	-2.8	40.0	0.0	0.0	0.0	0.0	20.0	56
Landfill			44.6	-8.8	-6.2	40.0	0.0	0.0	0.0	0.0	20.0	16
I-5			44.6	-8.8	-6.2	40.0	0.0	0.0	0.0	0.0	20.0	16

Phase 4 Construction Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
project site			69.0	-23.0	0.0	0.0		x	Total	1.52	r	1952684.82	592868.48	596.91
Admin building			55.1	-10.8	0.0	0.0		x	Total	1.52	r	1952706.15	592151.93	525.91
southern property			15.7	-30.6	0.0	0.0		x	Total	1.52	r	1953991.14	590860.76	489.71
Northern Property			25.9	-22.0	0.0	0.0		x	Total	1.52	r	1951475.18	593409.37	568.77
Residential Receiver			42.9	-5.9	0.0	0.0		x	Total	1.52	r	1954193.17	591682.49	411.57

Phase 5 Construction Noise Sources

Name	M.	ID	Result. PWL			Lw / Li		Operatir	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	Day					X	Y	Z
			(dBA)	(dBA)	(dBA)			(min)	(Hz)		(m)		(m)	(m)	(m)
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952715.08	592954.25	576.32
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952664.67	592987.05	576.72
Flat bed truck			118.7	118.7	118.7	Lw	bedtruck	36.00	1000	(none)	3.66	r	1952721.64	592961.06	572.04
Pick-up			89.7	89.7	89.7	Lw	pickup	12.00	1000	(none)	3.66	r	1952797.96	592906.16	563.83
Pick-up			89.7	89.7	89.7	Lw	pickup	12.00	1000	(none)	3.66	r	1952801.98	592904.47	563.48
Dump Truck			118.7	118.7	118.7	Lw	bedtruck	36.00	1000	(none)	3.66	r	1952788.01	592912.52	564.99
Dump Truck			118.7	118.7	118.7	Lw	bedtruck	36.00	1000	(none)	3.66	r	1952801.88	592917.39	564.31
Trencher			119.7	119.7	119.7	Lw	trencher	48.00	1000	(none)	3.66	r	1952798.70	592913.36	564.28
Drill Rig			119.7	119.7	119.7	Lw	trencher	48.00	1000	(none)	3.66	r	1952804.10	592911.25	563.81
Forklift			119.7	119.7	119.7	Lw	forklift	36.00	1000	(none)	3.66	r	1952792.45	592918.76	565.06
Crane			119.7	119.7	119.7	Lw	tcrane	24.00	1000	(none)	3.66	r	1952794.36	592915.69	564.75
Bob Cat			119.7	119.7	119.7	Lw	trencher	48.00	1000	(none)	3.66	r	1952805.05	592914.63	563.95
Tractor Loader			119.7	119.7	119.7	Lw	loader	42.00	1000	(none)	3.66	r	1952806.22	592920.14	564.19
Tractor Loader			119.7	119.7	119.7	Lw	loader	42.00	1000	(none)	3.66	r	1952799.76	592923.00	564.81
Heavy Truck			118.7	118.7	118.7	Lw	bedtruck	24.00	1000	(none)	3.66	r	1952791.08	592912.30	564.76
Heavy Truck			118.7	118.7	118.7	Lw	bedtruck	24.00	1000	(none)	3.66	r	1952792.88	592911.03	564.54
Heavy Truck			118.7	118.7	118.7	Lw	bedtruck	24.00	1000	(none)	3.66	r	1952795.63	592910.40	564.29
Heavy Truck			118.7	118.7	118.7	Lw	bedtruck	24.00	1000	(none)	3.66	r	1952798.81	592907.96	563.90
Crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1952945.62	592877.69	559.64
Crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1953027.79	592832.87	555.10
back hoe			114.7	114.7	114.7	Lw	backhoe	60.00	1000	(none)	3.66	r	1953100.36	592792.32	550.97
Crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1953152.12	592755.50	544.66
Crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1953226.28	592708.01	547.32
Concrete Pump			116.7	116.7	116.7	Lw	conpump	60.00	1000	(none)	3.66	r	1953095.13	592801.31	551.41
Crane			119.7	119.7	119.7	Lw	tcrane	60.00	1000	(none)	3.66	r	1952810.76	592958.62	584.83
Concrete Truck			119.7	119.7	119.7	Lw	contruck	60.00	1000	(none)	3.66	r	1953095.13	592792.90	551.11
Pickup			89.7	89.7	89.7	Lw	pickup	60.00	1000	(none)	3.66	r	1952931.77	592871.56	559.70
Pickup			89.7	89.7	89.7	Lw	pickup	60.00	1000	(none)	3.66	r	1953018.49	592839.29	555.59
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952814.46	592895.43	562.60
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952824.20	592894.42	562.32
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952836.98	592892.06	561.97
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952847.40	592889.04	561.70
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952857.48	592888.70	563.50
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952868.91	592886.01	563.48
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952891.77	592881.64	564.63
heavy truck			118.7	118.7	118.7	Lw	bedtruck	60.00	1000	(none)	3.66	r	1952899.84	592883.33	568.19
forklift			119.7	119.7	119.7	Lw	forklift	30.00	1000	(none)	3.66	r	1952904.88	592881.31	567.12
helicopter			132.6	132.6	132.6	Lw	helicopter	12.00	1000	(none)	30.00	r	1952799.81	592921.31	591.04
helicopter			132.6	132.6	132.6	Lw	helicopter	12.00	1000	(none)	60.00	r	1953222.82	592710.96	603.48
Trencher			119.7	119.7	119.7	Lw	trencher	36.00	1000	(none)	60.00	r	1954142.96	591592.53	471.26
backhoe			114.7	114.7	114.7	Lw	backhoe	36.00	1000	(none)	60.00	r	1954093.79	591577.79	476.40
saw			124.7	124.7	124.7	Lw	saw	36.00	1000	(none)	60.00	r	1954078.73	591572.80	479.30
paver			119.7	119.7	119.7	Lw	paver	36.00	1000	(none)	60.00	r	1954120.66	591586.71	473.03

Phase 5 Construction Noise Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li		Operating Time			K0	Freq.
			Day	Evening	Night	Day	Evening	Night	Type	Value	Day	Special	Night		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(dB)	(Hz)
Terrian Crane			113.3	1.6	1.6	91.9	-19.9	-19.9	PWL-Pt	tcrane	36.00	0.00	0.00	0.0	1000
Paver			122.3	10.5	10.5	91.9	-19.9	-19.9	PWL-Pt	paver	36.00	0.00	0.00	0.0	1000
vibratory consolidating paver			122.3	10.5	10.5	91.9	-19.9	-19.9	PWL-Pt	paver	36.00	0.00	0.00	0.0	1000
roller			122.3	10.5	10.5	91.9	-19.9	-19.9	PWL-Pt	paver	36.00	0.00	0.00	0.0	1000
water truck			118.7	7.0	7.0	90.9	-20.9	-20.9	PWL-Pt	watertruck	60.00	0.00	0.00	0.0	1000

Phase 5 Construction Roadways

Name	M.	ID	Lme			exact Count Data						Speed
			Day	Evening	Night	M			p (%)			Auto
			(dBA)	(dBA)	(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)
I-5			0.2	0.4	0.1	0.0	0.0	0.0	10.5	0.0	20.0	104
San Fernando			58.8	-5.8	-3.0	124.0	0.0	0.0	16.0	0.0	16.0	56
Landfill			55.5	-8.8	-6.3	124.0	0.0	0.0	16.0	0.0	16.0	16
I-5			55.5	-8.8	-6.3	124.0	0.0	0.0	16.0	0.0	16.0	16

Phase 5 Construction Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
project site			74.8	-23.2	0.0	0.0		x	Total	1.52	r	1952684.82	592868.48	596.91
Admin building			59.3	-11.0	0.0	0.0		x	Total	1.52	r	1952706.15	592151.93	525.91
southern property			31.1	-30.6	0.0	0.0		x	Total	1.52	r	1953991.14	590860.76	489.71
Northern Property			30.4	-22.0	0.0	0.0		x	Total	1.52	r	1951475.18	593409.37	568.77
Residential Receiver			69.3	-5.9	0.0	0.0		x	Total	1.52	r	1954193.17	591682.49	411.57

Phase 6 Construction Noise Sources

Name	M.	ID	Result. PWL			Lw / Li		Operatir	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	Day					X	Y	Z
			(dBA)	(dBA)	(dBA)			(min)	(Hz)		(m)		(m)	(m)	(m)
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952715.08	592954.25	576.32
Generator			116.7	116.7	116.7	Lw	generator	36.00	1000	(none)	3.66	r	1952664.67	592987.05	576.72
Flat Bed Truck			118.7	118.7	118.7	Lw	truck	36.00	1000	(none)	3.66	r	1952706.45	592943.58	579.42

Phase 6 Construction Roadways

Name	M.	ID	Lme			exact Count Data						Speed
			Day	Evening	Night	M			p (%)			Auto
			(dBA)	(dBA)	(dBA)	Day	Evening	Night	Day	Evening	Night	(km/h)
I-5			0.2	0.4	0.1	0.0	0.0	0.0	10.5	0.0	20.0	104
San Fernando			46.3	-5.8	-2.8	30.0	0.0	0.0	0.0	0.0	20.0	56
Landfill			43.3	-8.8	-6.2	30.0	0.0	0.0	0.0	0.0	20.0	16
I-5			43.3	-8.8	-6.2	30.0	0.0	0.0	0.0	0.0	20.0	16

Phase 6 Construction Receivers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
project site			44.5	-23.0	0.0	0.0		x	Total	1.52	r	1952684.82	592868.48	596.91
Admin building			38.8	-10.8	0.0	0.0		x	Total	1.52	r	1952706.15	592151.93	525.91
southern property			14.5	-30.6	0.0	0.0		x	Total	1.52	r	1953991.14	590860.76	489.71
Northern Property			16.9	-22.0	0.0	0.0		x	Total	1.52	r	1951475.18	593409.37	568.77
Northern Property			38.9	-5.9	0.0	0.0		x	Total	1.52	r	1954193.17	591682.49	411.57

6 Construction Vibration Impact Calculations

Project Name: SGPREP

Vibration Impact Calculations				
Vibration Source	**Vibration Level at 25 feet**	**Receiver Location**	**Distance from Source to Receiver (ft)**	**Pridected Vibration Level (VdB)**
Bull Dozer	87	Administration Building	2,300	28.1
Bull Dozer	87	Souther Property Line	6,562	14.4
Bull Dozer	87	Northern Property Line	4,275	20.0
Bull Dozer	87	East Residential Receptor	6,323	14.9