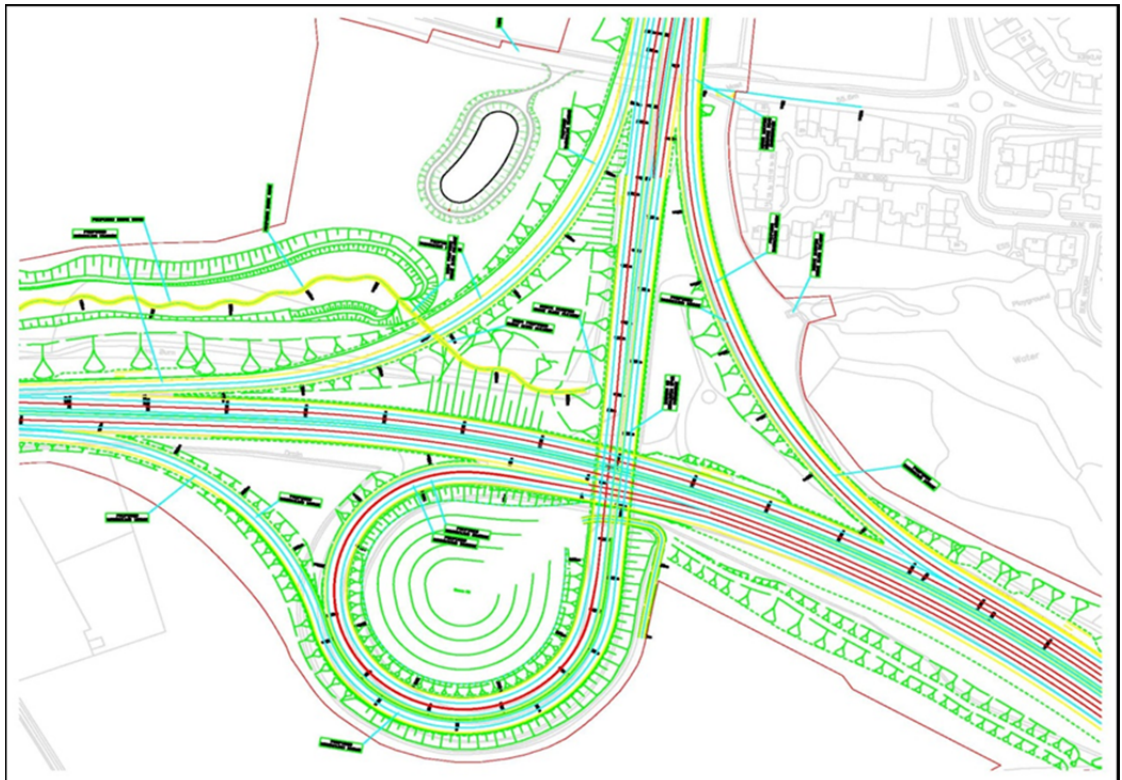


FORTH REPLACEMENT CROSSING M9 Junction 1a – Project Quality Baseline Noise Data



Baseline Noise Measurements

Introduction

Baseline noise monitoring for the Junction 1a contract started on 25th August 2011, with noise data being gathered at three permanent locations and 17 spot measurement sites. Vibration data is also being gathered at the three permanent monitoring locations; this is considered in a separate report.

The three permanent locations are:

- CNV02: 93/95 King Edwards Way
- CNV07: 15-17 Buie Rigg
- CNV16: 8 Kirklands Park Grove

The 17 spot measurement locations are:

- CNV01: 39 Cotlaws
- CNV03: 55 King Edwards Way
- CNV04: 85 Maitland Hog Lane
- CNV05: 38 King Edwards Way
- CNV06: 26 Cotlaws
- CNV08: 26 Buie Rigg
- CNV09: 8 Buie Rigg
- CNV10: 43 Buie Rigg
- CNV11: 34 Buie Rigg
- CNV12: Kirkliston Sports Centre
- CNV13: Kirkliston Sports Centre
- CNV14: 1 Glendinning Road
- CNV15: 11 Glendinning Road
- CNV17: 11 Kirklands Park Grove
- CNV18: Wester Humble
- CNV19: Millrig Cottages
- CNV20: Overton Cottages

A plan showing these measurement positions is contained in Appendix A.

This document sets out the results of the measurements gathered at the three permanent monitoring locations to date. The data gathered at the 17 spot monitoring locations is included for information purposes only in Appendix B; insufficient data has been gathered at the spot measurement positions to draw any meaningful conclusions at this time. An additional nine number receptor locations were identified during the noise prediction process.

Survey Method

All of the sound level meters conform to Type 1 specification, as detailed in BS EN 61672-1 *Specification for Integrating-Averaging Sound Level Meters*. The equipment used is as set out in Appendix C. The laboratory calibration status of each item is also listed in Appendix C.

The field calibration of the permanent sound level meters was checked at the start of the measurements and is being checked monthly. No calibration drifts of more than 0.5dB have been identified.

The field calibration of the sound level meter used for the spot measurements follows a similar procedure – the calibration is checked at the start of the measurements and checked periodically during the survey. Again, no calibration drifts of more than 0.5dB have been identified.

All of the measurements have been undertaken at positions 1 metre from the façade of the stated building. The microphones for the three permanent monitoring locations are elevated primarily to avoid interference with the local population; CNV02 is at a height of approximately 4 metres (1st floor level), CNV07 is at a height of approximately 8 metres (2nd floor level), and CNV16 is at a height of approximately 4.5 metres (1st floor window level). The spot measurements have been undertaken at a height of approximately 1.5 metres above local ground level.

Photos of the permanent installations are included in Appendix D.

Survey Results

The weather since the start of the survey has varied; there have been occasions where the conditions were ideal for noise monitoring, i.e. dry with low wind speeds, to conditions that were considered far from ideal with high winds and rain. In particular, the 10th, 11th and 12th September 2011 were very windy. These periods have not been excluded as they did not have an adverse effect on the measured noise levels.

Weather information for the monitoring period is included in Appendix E. This was obtained from the Weather Station located at Edinburgh Airport via the “wunderground.com” website. A weather station is scheduled to be located at the site compound in the coming fortnight and readings from this will be used to supplement all survey data, once this is operational.

We note that our Noise Specialist has calculated the noise levels with and without periods of poor weather and the results were unaffected.

The dominant noise source at all positions was road traffic noise associated with the motorway. There were also contributions from aircraft, local neighbourhood noise such as barking dogs, children, and agricultural vehicles.

During the Survey Period from 25th August 2011 to 5th September 2011, no site works were being undertaken. This period is taken to be the baseline period.

From 6th September 2011 to 19th September 2011, the only works were the establishment of the site compound on Newmains Road. These activities are unlikely to have had a significant effect on the ambient noise climate at the three permanent positions, however, daytime data from for this period is classed as construction works.

From the 19th September, construction activities ramped up and the key dates where construction activities commenced are listed below:

- 6th September 2011 – Commenced Compound works in Area 9
- 19th September 2011 – Access road around Swine Burn in Area 9
- 27th September 2011 – Swine Burn topsoil stripping works in Area 9

- 27th September 2011 – D loop stripping and topsoil storage in Area 6
- 10th October 2011 – Tree felling within areas 4,5,6,8,9,10
- 14th October 2011 – Commenced in Area 4 – earthworks
- 17th October 2011 – Commenced rockbreaking in Area 5 (Quarry)
- 21st October 2011 – Commenced Stripping Topsoil in Area 9

These areas are marked in the Chainage Sketch Drawing. This drawing and the readings for each permanent monitoring station are attached in Appendix F.

Realistically, to a greater or lesser extent, construction works from these dates have had the potential to be heard at the nearest receptors. However, as can be determined from the activity descriptions, some would obviously have a larger impact than others.

The average ambient noise levels measured during the baseline noise measurement period (from the start to 5th September 2011) at the three permanent positions are summarised in Table 1, in terms of the $L_{Aeq,T}$ noise index.

The full survey results for the three permanent positions, and the 17 spot positions are attached as Excel spreadsheets. The data for the three permanent monitoring stations are broken down into the pre-construction period, the monthly construction noise levels, and a graphical representation of the data. The graphical representations of the data for September and October do not include evening and night-time periods as there were no works during these periods.

The day, evening and night-time periods reflect the contract requirements:

- daytime periods are 08:00 to 19:00 hours Monday to Friday and 08:00 to 18:00 hours Saturday;
- evening periods are 19:00 to 22:00 hours Monday to Friday and 18:00 to 22:00 hours Saturday;
- daytime period for Sundays is 08:00 to 22:00 hours; and
- night-time periods are 22:00 to 08:00 hours for all seven days of the week.

Table 1: Summary of Baseline Ambient Noise Levels, façade dB

Position	Period of Week	Period	Average $L_{Aeq,T}^{(1)}$
CNV02: 93/95 King Edwards Way	Mon-Sat	Day	75.6
		Eve	72.7
		Night	70.3
	Sun	Day	74.6
		Night	71.6
CNV07: 15-17 Buie Rigg	Mon-Sat	Day	68.3
		Eve	65.6
		Night	63.1
	Sun	Day	68.0
		Night	64.4
CNV16: 8 Kirklands Park Grove	Mon-Sat	Day	65.1
		Eve	62.5
		Night	60.1
	Sun	Day	65.8
		Night	61.7
Notes:			

Position	Period of Week	Period	Average $L_{Aeq,T}^{(1)}$
<p>⁽¹⁾ - Time period T is as follows for each period:</p> <ul style="list-style-type: none"> • 11 hours for weekday daytime • 10 hours for Saturday daytime • 3 hours for weekday evening • 4 hours for Saturday evening • 14 hours for Sunday daytime • 10 hours for night-time 			

Assessment Levels

The measured noise levels set out in Table 1 represent the most up-to-date picture of the ambient noise climates at the three locations. It is considered appropriate to update the assessment thresholds set out in the ES in light of the above information.

The assessment levels set out in the ES for the three permanent monitoring locations are shown in Table 2.

Table 2: ES Assessment Levels, façade $L_{Aeq,T}$ dB

Location	Period	Ambient Noise Level	Assessment Level
CNV02: 93/95 King Edwards Way	Day	72	75
	Evening	-	55 ⁽¹⁾
	Night	-	45 ⁽¹⁾
CNV07: 15-17 Buie Rigg	Day	67	70
	Evening	-	55 ⁽¹⁾
	Night	-	45 ⁽¹⁾
CNV16: 8 Kirklands Park Grove	Day	67	70
	Evening	68 ⁽²⁾	65 ⁽³⁾
	Night	65 ⁽²⁾	55 ⁽³⁾

Note:
⁽¹⁾ - No ambient noise data in the ES, so lowest assessment level assumed
⁽²⁾ - Evening and night-time noise levels calculated from periodic data in Appendix 16.3 of the ES.
⁽³⁾ - The Assessment Levels were not stated in the ES, these have been derived based on the ambient noise levels reported in the ES.

Using the noise data gathered at the three monitoring locations as a starting point, more up to date assessment levels have been determined using the same process as was adopted in the ES. This is shown in Table 3.

Table 3: Updated Assessment Levels, façade $L_{Aeq,T}$ dB

Location	Period	Measured Ambient Noise Level	Rounded to Nearest 5dB	Updated Assessment Level
CNV02: 93/95 King Edwards Way	Day	75.6	75	75
	Evening	72.7	75	65
	Night	70.3	70	55
CNV07: 15-17 Buie Rigg	Day	68.3	70	75
	Evening	65.6	65	65
	Night	63.1	65	55
CNV16: 8 Kirklands Park Grove	Day	65.1	65	70
	Evening	62.5	60 ⁽¹⁾	65
	Night	60.1	60	55

Notes:
⁽¹⁾ - measured noise level rounded down

It can be seen from Table 3 that the daytime assessment levels remain the same as the ES for 93/95 King Edwards Way (CNV02) and 8 Kirklands Park Grove (CNV16).

The up to date measurement data for 15-17 Buie Rigg (CNV07) suggests that a threshold level of 75dB would be appropriate.

The evening and night-time receptors have not changed at CNV16. Evening and night-time thresholds were not given in the ES for the other two receptors.

It is stressed that the change in assessment levels is incidental to the updating of the baseline noise climate information. The baseline noise data is used to correct the measured noise levels during construction works to obtain an inferred construction noise level. This information is to be submitted to TS monthly.

The baseline has changed by varying amounts since the data in the ES was produced, so it is essential to use the most recent baseline data in the derivation of the construction noise levels. Using an older, potentially out of date baseline value will lead to an over-estimate of the construction noise levels.

To maintain consistency in the presentation of the monthly data, the assessment levels must follow the template given in the CoCP. Where the baseline has changed, then the assessment thresholds will too; however, the principal reason for using the new baseline information is to ensure that the derived construction noise levels are as accurate as possible, not to obtain different assessment levels.

To ensure that the baseline data remains as current as possible, the dataset from which it is derived will be updated using data gathered in periods where there are no construction works.

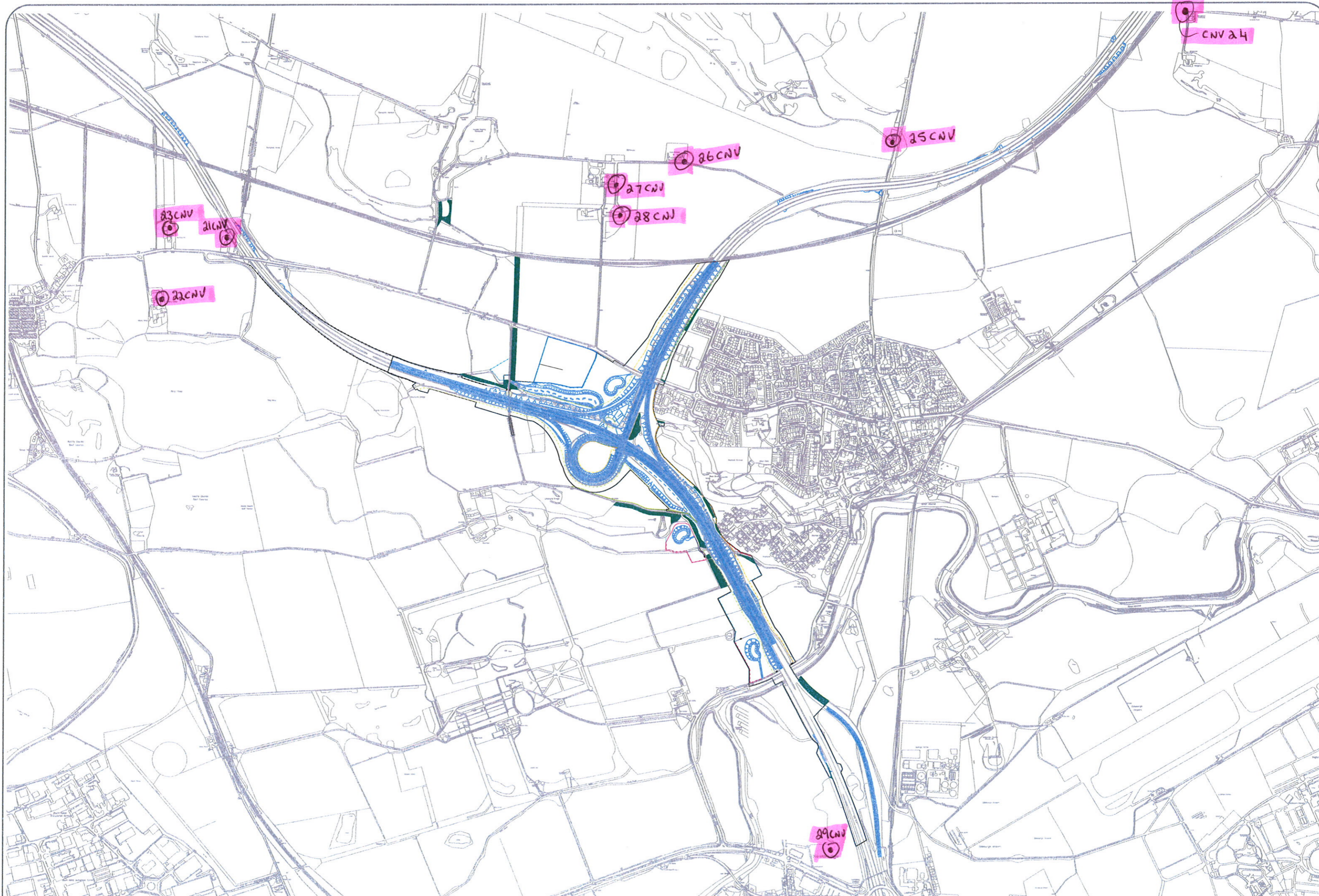
Evening and night-time construction works will not be a regular feature of the Junction 1a contract, however, there is the occasional need to make use of these hours, for example to accommodate traffic management works and 24 hour plant such as water pumps.

Appendix A

Plan Showing Measurement Positions

(Note: an additional nine receptors were identified and a drawing showing locations is currently being prepared)





LEGEND




 Project: Forth Replacement Crossing M9 Junction 1a Upgrade

Title: Site Layout

Date	Nov 2011	Scale	N.T.S.
Drawn By	AM	Drawing No.	SRB/SK/A1-26/01
Rev.	0		

Appendix B

Spread sheet showing short term noise levels

Receptor	Address	Gen Area	Location of SLM	Date of record	Time of record	Duration of record (mins)	SLM (All readings at 1m from facade, A weighted, fast, normal, unless otherwise stated)										Influential noise sources (other than motorway traffic)
							SLM Report no.	Laeq	Lamax	Lpeak(dBF)	L1	L5	L10	L50	L90	L95	
01 CNV	39 Cotlaws	Gateside	1m from rear door	25/08/2011	14.32-14.47	15	33	73	81	99	76	75	75	73	70	69	aircraft noise
				31/08/2011	20.58-21.16	18	83	71	77	97	76	74	74	71	66	65	aircraft noise
				30/08/2011	06.17-06.32	15	56	76	80	98	79	78	77	75	73	73	aircraft noise
02 CNV	93/95 King Edwards Way	Gateside	1m from rear door	25/08/2011	14.53-15.08	15	34	71	82	98	75	74	73	71	68	67	intermittent dog barking
				31/08/2011	20.40-20.55	15	82	69	83	97	73	72	71	68	64	62	aircraft noise
				30/08/2011	05.59-06.15	16	55	72	79	96	76	75	74	72	68	66	aircraft noise
03 CNV	55 King Edwards Way	Gateside	1m from rear door	25/08/2011	15.14-15.29	15	35	62	69	93	65	64	64	62	60	59	none
				31/08/2011	20.18-20.33	15	81	61	73	111	65	64	63	61	58	57	aircraft noise
				30/08/2011	05.35-05.50	15	54	63	69	94	67	66	65	63	59	58	aircraft noise
04 CNV	85 Maitland Hog Lane	Gateside	1m from rear window	25/08/2011	15.41-15.56	15	36	62	68	90	67	66	65	62	56	56	aircraft noise
				31/08/2011	19.53-20.08	15	80	61	72	97	68	63	62	60	58	57	aircraft noise
				30/08/2011	06.44-07.00	16	57	67	78	97	72	70	69	66	65	64	aircraft noise
05 CNV	38 King Edwards Way	Gateside	1m from side door	26/08/2011	13.05-13.20	15	51	55	67	97	60	57	57	55	53	53	aircraft noise
				31/08/2011	21.21-21.37	16	84	59	74	93	69	64	60	56	53	52	aircraft noise
				30/08/2011	04.51-05.06	15	52	57	69	86	63	60	59	56	53	53	one car on access rd
06 CNV	26 Cotlaws	Gateside	1m from gable end below window	26/08/2011	12.33-12.48	15	50	56	64	89	59	58	58	56	55	54	aircraft noise
				31/08/2011	19.30-19.45	15	79	56	61	84	59	58	58	56	54	53	aircraft noise
				30/08/2011	05.13-05.28	15	53	57	65	91	60	60	59	57	55	54	none
07 CNV	15-17 Buie Rigg	Buie Rigg															
08 CNV	26 Buie Rigg	Buie Rigg	1m from patio door	25/08/2011	18.42-18.57	15	39	63	74	100	69	67	66	62	57	55	none
				25/08/2011	20.30-20.54	24	43	62	75	101	70	67	66	60	55	53	none
				25/08/2011	23.41-23.57	16	44	57	72	98	67	63	61	53	41	38	aircraft noise
09 CNV	8 Buie Rigg	Buie Rigg	1m from rear wall	25/08/2011	17.27-17.42	15	38	61	68	91	65	63	63	61	59	58	none
			25/08/2011	19.07-19.22	15	40	62	70	91	67	66	65	60	55	54	none	
			No access to rear. Taken at gable	26/08/2011	00.01-00.16	15	45	54	70	92	66	61	57	49	43	42	aircraft noise
10 CNV	43 Buie Rigg	Buie Rigg	1m from rear window	30/08/2011	13.57-14.12	15	58	61	68	96	65	64	63	61	58	58	aircraft noise
				30/08/2011	19.00-19.15	15	63	62	67	97	65	64	63	61	59	59	aircraft noise
				30/08/2011	23.16-23.31	15	70	52	64	88	61	57	56	50	45	43	aircraft noise
11 CNV	34 Buie Rigg	Buie Rigg	1m from rear window	30/08/2011	18.17-18.32	15	62	63	72	96	68	66	65	62	60	59	traffic on side road, aircraft, children playing in other gardens
				30/08/2011	21.13-21.28	15	69	58	79	105	66	62	60	56	51	50	aircraft noise
				31/08/2011	00.46-01.01	15	74	46	59	87	55	53	51	39	33	32	none
12 CNV	Kirkliston Sports Centre	Kirkliston Sports Centre	1m from rear wall	26/08/2011	11.45-12.00	15	49	64	69	92	67	66	66	64	61	60	aircraft noise
				30/08/2011	20.13-20.28	15	66	64	82	96	68	67	66	64	60	59	children playing in playground at 20m distance, aircraft noise
				31/08/2011	01.06-01.24	18	75	53	72	95	62	58	56	45	34	31	aircraft noise
13 CNV	Kirkliston Sports Centre	Kirkliston Sports Centre	1m from rear wall	26/08/2011	11.27-11.43	16	48	64	72	99	68	67	66	64	62	61	aircraft noise
				30/08/2011	20.31-20.46	15	67	66	96	111	74	66	64	60	56	54	sports pitch at 40m NE and tennis court at 40m NW in use. High peak caused by goals being disassembled at 10m from SLM. Also aircraft noise.
				31/08/2011	01.28-01.43	15	76	51	63	92	60	57	55	45	39	38	none
14 CNV	1 Glendinning Road	Glendinning Road	1m from front window (by request of owner)	30/08/2011	17.51-18.06	15	61	65	81	97	68	67	67	64	62	61	traffic on Gleninning Rd, aircraft, children playing in other gardens
				30/08/2011	20.52-21.07	15	68	60	68	91	65	63	63	59	56	54	Side road traffic plus aircraft
				31/08/2011	00.25-00.40	15	73	51	60	86	57	55	54	49	42	40	none
15 CNV	11 Glendinning Road	Glendinning Road															
16 CNV	8 Kirklands Park Grove	Kirklands Park Grove	1m to rear of conservatory	25/08/2011	11.44 -12.02	17	31	61	69	95	66	64	64	60	58	57	none
				25/08/2011	19.48-20.03	15	41	61	70	96	65	64	63	60	55	54	none
				26/08/2011	00.21-00.39	18	46	54	66	94	62	59	57	51	44	42	aircraft noise

SLM (All readings at 1m from facade, A weighted, fast, normal, unless otherwise stated)																	
Receptor	Address	Gen Area	Location of SLM	Date of record	Time of record	Duration of record (mins)	SLM Report no.	Laeq	Lamax	Lpeak(dBF)	L1	L5	L10	L50	L90	L95	Influential noise sources (other than motorway traffic)
17 CNV	11 Kirklands Park Grove	Kirklands Park Grove	1m from rear window	25/08/2011	12.52 - 13.08	15	32	62	73	99	67	65	64	61	57	55	none
				25/08/2011	20.07-20.23	16	42	61	71	97	67	65	64	60	58	57	none
				26/08/2011	00.42-00.59	17	47	55	69	96	64	61	59	51	38	35	aircraft noise
18 CNV	Wester Humble	country	1m from rear window	30/08/2011	15.24-15.39	15	60	56	68	94	61	59	58	56	54	53	Agri vehicles drawing grain, aircraft
				30/08/2011	19.50-20.06	16	65	54	62	91	58	56	56	54	51	51	aircraft noise
				31/08/2011	00.02-00.17	15	72	49	62	82	55	53	52	48	44	42	none
19 CNV	Millrig Cottages	country	1m from rear window	31/08/2011	14.46-15.02	17	77	58	65	91	62	61	60	57	54	53	Side road traffic plus aircraft
				31/08/2011	19.04-19.19	15	78	57	64	85	61	60	60	56	53	52	Side road traffic plus aircraft
				31/08/2011	23.13-23.30	17	85	49	64	88	61	54	52	45	40	39	Side road traffic plus aircraft
20 CNV	Overton Cottages	country	1m from front door	30/08/2011	14.52-15.07	15	59	56	74	91	65	59	57	54	51	50	2no cars passing on side road at 7m distance, aircraft
				30/08/2011	19.24-19.40	16	64	57	81	98	63	57	56	53	50	49	Agri vehicles drawing grain, aircraft
				30/08/2011	23.39-23.54	15	71	49	59	78	57	54	53	47	40	38	none
	31 King Edwards Way	Gateside	1m from rear door	25/08/2011	16.06-16.21	15	37	60	70	91	64	62	61	59	57	56	Ice cream van, school children on way home, helicopter, aircraft
	No.4 Humble cottages	country	1m from NE gable end	11/10/2011	15.52-16.07	15	11	52	65	91	58	56	55	50	48	47	Trees, aircraft noise
			1m from NE gable end	11/10/2011	21.10-21.15	15	19	54	94	108	64	62	55	46	43	43	Trees, aircraft noise plus one car drove into yard
			1m from NE gable end	12/10/2011	06.43-06.58	15	21	60	73	91	66	63	61	59	57	56	aircraft noise
	Humble Farm	country	1m from W gable	11/10/2011	16.17-16.32	15	12	48	64	92	56	52	50	46	45	44	aircraft noise
			1m from W gable	11/10/2011	20.48-21.03	15	18	49	65	88	59	55	52	45	42	41	aircraft noise
			1m from W gable	12/10/2011	06.23-06.38	15	20	59	74	92	65	61	60	58	57	56	aircraft noise
	Humble House	country	1m from E gable	11/10/2011	16.32-16.47	15	13	55	68	91	58	56	56	54	53	52	Side road traffic plus aircraft
			1m from E gable	11/10/2011	20.25-20.40	15	17	54	63	83	58	57	56	53	50	49	Side road traffic plus aircraft
			1m from E gable	12/10/2011	07.11-07.16	17	22	60	70	90	65	63	62	60	57	56	Side road traffic plus aircraft
23 CNV	Halley transport	country	1m from pre-fab office window	11/10/2011	17.08-17.22	15	14	56	85	113	63	59	58	54	51	50	Yard of haulage and bus company. Yard traffic. Outside phone bell. Side road traffic plus aircraft
			1m from pre-fab office window	11/10/2011	20.00-20.15	15	16	50	72	94	61	53	50	46	42	41	side road traffic plus aircraft
			1m from pre-fab office window	12/10/2011	07.45-08.00	15	23	65	74	94	72	69	68	64	62	61	Yard traffic. Side road traffic plus aircraft
22 CNV	Nidory Mains Farm	country	1m from N gable	11/10/2011	17.34-17.49	15	15	53	70	101	66	60	54	43	42	42	Approx 10 large dogs in outside yard. Owner agreed to readings but said would be pointless trying to do evening or night reading as dogs would be too excited. Owner felt there was no need for further monitoring.
21 CNV	Murie Hall	country	1m from sth side of house	12/10/2011	15.40-15.55	15	25	65	73	95	69	68	67	64	62	62	Side road traffic plus aircraft
			1m from RHS front gate	12/10/2011	19.23-19.38	15	30	69	89	98	81	75	70	62	58	57	Side road traffic plus aircraft
			1m from RHS front gate	12/10/2011	23.00-23.15	15	31	64	84	98	78	64	61	55	50	48	Side road traffic plus aircraft
	South Lodge Dundas estate	Queensferry rd	1m from front window	12/10/2011	16.16-16.31	15	26	68	82	96	77	75	73	60	56	55	Side road traffic (20m) plus aircraft plus vehicles on estate rd(8m)
			1m from front window	12/10/2011	19.49-20.04	15	29	64	80	93	75	71	68	54	49	48	Side road traffic (20m) plus aircraft plus vehicles on estate rd(8m)
			1m from front window	12/10/2011	23.26-23.41	15	32	57	77	96	71	59	54	48	42	40	Side road traffic (20m) plus aircraft
	Premier Inn		1m from rear wall of hotel	12/10/2011	16.54-17.09	15	27	72	77	97	75	74	73	72	69	69	aircraft noise, hotel moreorless under flight path
				12/10/2011	19.23-19.38	15	28	69	81	96	75	72	71	68	65	64	aircraft noise, hotel moreorless under flight path
				12/10/2011	23.53-24.08	15	33	61	75	93	69	67	65	57	48	47	aircraft noise, hotel moreorless under flight path

Receptor	Address	Gen Area	Location of SLM	Date of record	Time of record	Duration of record (mins)	SLM (All readings at 1m from facade, A weighted, fast, normal, unless otherwise stated)										Influential noise sources (other than motorway traffic)
							SLM Report no.	Laeq	Lamax	Lpeak(dB F)	L1	L5	L10	L50	L90	L95	
01 CNV	39 Cotlows	Gateside	1m from rear door	28/09/2011	15.10-15.26	16	93	75	83	99	78	77	76	74	72	72	none discernible
				10/10/2011	22.31-22.46	15	4	70	79	96	77	74	73	68	60	59	aircraft noise, wet road surface
03 CNV	55 King Edwards Way	Gateside	1m from rear door	28/09/2011	15.29-15.44	15	94	67	91	105	69	68	67	66	64	63	aircraft noise, drill in nearby house
				10/10/2011	22.06-22.21	15	3	62	70	95	67	65	65	62	58	57	Dog in nearby house, aircraft noise, wet road surface
04 CNV	85 Maitland Hog Lane	Gateside	1m from rear window	10/10/2011	21.41-21.56	15	2	60	71	90	65	63	62	59	56	55	none discernible, wet road surface
05 CNV	38 King Edwards Way	Gateside	1m from side door	28/09/2011	15.55-16.10	15	95	65	77	111	70	67	66	64	62	62	aircraft noise
				10/10/2011	22.48-23.03	15	5	60	80	102	71	63	62	57	52	51	aircraft noise, wet road surface
06 CNV	26 Cotlows	Gateside	1m from gable end below window	10/10/2011	21.15-21.30	15	1	57	62	89	61	60	59	57	55	54	aircraft noise, wet road surface
13 CNV	Kirkliston Sports Centre	Kirkliston Sports Centre	1m from rear wall	15/19/11	14.45-15.00	15	91	63	70	94	67	66	65	63	60	58	Aircraft noise. Note: Construction noise from compound cannot be distinguished from background.

Appendix C

Table C: Noise Monitoring Equipment

Unique Reference	Location	Type	Description	Serial Number	Date Last Calibrated	Date of Next Calibration
Permanent equipment						
NM01	CNV2 King Edwards Way	Larson Davis 831	Sound Level Meter	2623	August 11 2011	August 2012
NM02	CNV7 15-17 Buie Rigg	Larson Davis 812	Sound Level Meter	769	August 11, 2011	August 11, 2012
NM03	CNV16 8/10 Kirkland Park Grove	Larson Davis 831	Sound Level Meter	2622	Purchased August 2011	August 2012
Portable equipment – All Spot Measurement Positions						
NM04	Mobile	Larson Davis 824	Sound Level Meter	824A3548	March 24 2011	March 24, 2012
CAL03	Mobile	CEL-110/2	Calibrator	077020	August 25, 2011	August 25, 2012
Casella	Mobile	CEL 490	Sound Level Meter	027645	August 15,2011	August 15,2012

Appendix D

Photos of Permanent Monitoring Locations



Plate 1: CNV07: 15-17 Buie Rigg



Plate 2: CNV16: 8 Kirklands Park Grove



Plate 3: CNV02: 95 King Edwards Way

Appendix E

Weather records for the monitoring period

Date	Month	Max Temp °C	Min Temp °C	Mean Temp °C	Average Humidity %	Precipitation mm	Average Wind Speed m/s	Max Wind Speed m/s
25	August	17	7	12	83	2.4	1.1	3.6
26	August	16	8	12	92	8.4	1.1	5.0
27	August	13	17	9	89	12.6	1.7	5.6
28	August	12	14	9	81	19.4	5.3	8.9
29	August	12	16	9	71	0.0	4.2	7.2
30	August	14	16	11	80	0.2	3.6	5.6
31	August	12	15	10	80	0.0	0.8	1.9

Source: Edinburgh Airport, Scotland (wunderground.com)

Date	Month	Max Temp °C	Min Temp °C	Mean Temp °C	Average Humidity %	Precipitation mm	Average Wind Speed m/s	Max Wind Speed m/s
1	September	14	17	11	79	0.0	1.4	4.7
2	September	16	19	13	79	0.6	3.6	8.3
3	September	15	20	10	86	3.8	2.2	7.2
4	September	17	5	11	82	0.4	1.1	4.2
5	September	17	7	12	83	2.4	2.2	7.8
6	September	16	12	14	82	17.4	7.2	15.0
7	September	16	10	13	80	3.2	6.4	9.2
8	September	17	9	13	78	1.4	3.6	5.6
9	September	19	14	10	91	4.2	1.9	5.0
10	September	21	18	14	83	2.0	3.3	9.2
11	September	17	14	12	78	0.4	6.1	13.9
12	September	16	14	12	86	15.8	7.2	16.4
13	September	14	12	11	87	12.8	10.6	15.6
14	September	15	11	7	76	0.8	5.3	8.3
15	September	14	3	8	83	0.0	2.2	5.6
16	September	14	10	6	89	0.0	3.1	6.7
17	September	14	12	9	90	3.2	2.8	6.1
18	September	15	7	11	92	2.2	1.4	3.1
19	September	16	12	7	89	1.4	3.1	8.3
20	September	15	12	9	82	1.8	5.0	9.7
21	September	13	10	8	80	9.6	6.4	11.4
22	September	15	12	9	78	8.0	6.4	9.7
23	September	17	14	11	80	11.4	4.7	11.4
24	September	18	14	10	76	0.0	4.7	7.8
25	September	18	14	11	78	0.0	4.2	10.3
26	September	15	12	8	74	0.0	4.7	8.3
27	September	19	15	11	80	0.0	4.4	10.8
28	September	24	17	10	80	0.0	2.8	9.7

29	September	21	16	12	83	0.0	2.8	9.2
30	September	25	18	11	82	3.6	1.7	5.6

Source: Edinburgh Airport, Scotland (wunderground.com)

Date	Month	Max Temp °C	Min Temp °C	Mean Temp °C	Average Humidity %	Precipitation mm	Average Wind Speed m/s	Max Wind Speed m/s
1	October	18	13	16	97	5.2	1.4	4.2
2	October	16	13	14	96	23.6	1.9	4.7
3	October	18	10	14	83	1.0	4.7	12.2
4	October	13	11	12	82	0.8	7.2	10.3
5	October	18	9	14	85	2.4	7.8	15.8
6	October	10	5	8	83	13.0	6.4	12.2
7	October	14	6	10	73	0.0	3.6	5.6
8	October	14	8	11	94	9.6	2.5	5.0
9	October	16	12	14	86	0.2	6.1	9.2
10	October	13	10	12	88	5.8	3.6	6.1
11	October	13	8	10	81	2.4	3.6	7.2
12	October	10	8	9	91	6.6	1.9	4.2
13	October	14	9	12	92	0.0	1.1	3.1
14	October	17	9	13	84	0.0	2.2	6.7
15	October	15	14	13	77	0.0	4.7	8.9
16	October	13	8	10	81	0.0	4.7	7.8
17	October	12	4	8	86	45.0	6.1	12.2
18	October	10	5	8	80	2.0	6.7	10.3
19	October	9	1	5	72	0.0	3.9	5.6
20	October	11	1	6	87	2.2	3.3	8.9
21	October	14	10	12	85	0.8	6.7	10.3
22	October	13	10	12	73	0.0	6.1	10.8
23	October	17	13	9	77	1.6	4.2	7.2
24	October	16	12	14	74	0.0	5.0	8.9
25	October	15	4	10	83	2.6	4.4	7.8
26	October	12	6	9	83	1.8	1.7	6.1
27	October	13	6	10	82	0.0	2.8	5.0
28	October	12	5	8	79	0.0	4.7	8.9

29	October	14	11	12	80	0.0	5.8	11.4
30	October	15	11	13	79	0.0	5.8	8.3
31	October	16	10	13	83	1.0	4.4	9.2

Source: *Edinburgh Airport, Scotland (wunderground.com)*

Date	Month	Max Temp °C	Min Temp °C	Mean Temp °C	Average Humidity %	Precipitation mm	Average Wind Speed m/s	Max Wind Speed m/s
1	November	12	5	8	82	0.0	2.8	7.2
2	November	14	5	10	80	0.0	2.8	6.1
3	November	17	11	14	82	0.0	3.9	7.2
4	November	14	4	9	92	0.0	1.7	4.7
5	November	11	1	6	95	0.0	1.1	3.6
6	November	10	-4	4	92	0.0	1.7	3.6
7	November	6	0	3	98	0.0	1.7	3.6
8	November	11	5	8	94	0.0	2.8	5.0
9	November	13	9	11	86	0.0	3.1	5.0
10	November	15	10	6	89	0.0	1.9	6.1

Source: Edinburgh Airport, Scotland (wunderground.com)

Appendix F

Chainage sketch drawing and readings for each permanent monitoring station

