

- compare the calculated wind farm noise emission levels with the derived criterion curves; and
- change the proposed locations of the wind turbines (if necessary) so that the noise limits are achieved.

Prior to commencing the noise survey we would like to agree suitable locations at which to monitor background noise levels to provide representative data for the area. The attached Figure 1 shows the indicative predicted wind farm noise contours based on a current draft wind farm layout and proposed background noise monitoring locations.

We have undertaken initial modelling based on a draft 42 turbine layout. Noise predictions were undertaken using data for the Siemens SWT 93, 2.3MW turbine which was chosen to be representative of the turbines of its size that could be installed at the site. Figure 1 shows which of the neighbouring properties to the proposed wind farm development fall within the 35dB(A) L_{90} contour. Any property outside of the 35dB(A) contour does not need to be considered in the assessment as protection of the amenity of these properties can be controlled through a simplified noise condition as detailed in ETSU-R-97. ETSU-R-97 states that '*For single turbines or wind farms with very large separation distances between the turbines and the nearest properties, a simplified noise condition may be suitable. If the noise is limited to an $L_{90,10min}$ of 35dB(A) up to wind speeds of 10m/s at 10m height, then this condition alone would offer sufficient protection of amenity, and background noise surveys would be unnecessary.*'

We believe noise monitoring equipment installed at eight dwellings would provide representative background noise data for the area. The properties identified are the closest ones to the site, and therefore it can be assumed that if noise limits can be achieved at these locations, the limits will also be achieved at other properties located at greater distance from the wind farm. This results in a total of eight monitoring locations as detailed in Table 1.

Table 1 **Suggested Noise Monitoring Locations**

| Property/Location | Eastings | Northings | Justification |
|------------------------|----------|-----------|--|
| H1 High Dykes | 266902 | 638665 | Closest property to the west of the western cluster of turbines to provide representative data for the dwellings in that area. |
| H2 Gainerhill Cottages | 267554 | 639666 | Property to the north west of the western cluster of turbines to provide representative data for the dwellings in that area. |
| H3 Hawkwood | 268536 | 639510 | Closest property to the north of the western cluster of turbines to provide representative data for the dwellings in that area. |
| H4 Lambhill | 269587 | 639636 | Closest property to both clusters of turbines to provide representative data for the dwellings in that area. |
| H5 Hazliebank | 270032 | 640951 | Closest property to the north west of the eastern cluster of turbines to provide representative data for the dwellings in that area. |
| H6 High Dyke House | 272143 | 640932 | Closest property to the north of the eastern cluster of turbines to provide representative data for the dwellings in that area. |
| H7 Hareshawhead | 273697 | 639650 | Closest property to the north east of the eastern cluster of turbines to provide representative data for the dwellings in that area. |
| H8 Kype Lodge | 273485 | 638644 | Closest property to the east of the eastern cluster of turbines. |

Monitoring at the locations listed in Table 1 is subject to consent from the owners/occupiers. If we are unable to gain access to monitor at the proposed properties, representative alternative locations will be selected and we will inform you of these alternative locations.

TNEI are aware of the consented Dungavel windfarm and propose to use the noise limits already set for the three properties detailed in the consented scheme and ensure that the addition of the turbines at Kype Muir will not breached those limits. The properties are shown on Figure 1 in green. The final report will also contain a section on cumulative noise impacts and will demonstrate the potential noise impacts of the cumulative operation of the two windfarms on the properties detailed above.

In addition to the operational noise assessment, TNEI will undertake a construction noise assessment to determine the potential noise impacts during the construction and decommissioning phases of the wind farm as requested in the scoping opinion. PAN 56 'Planning and Noise' refers to 'BS 5228 Noise control on construction and open sites. *'In particular, Part 1, "Code of Practice for basic information and procedures for noise control" will be useful because as well as giving general advice, it describes a method for predicting noise from construction sites.'* The construction noise assessment will be undertaken in accordance with the methodology outlined in British Standard (BS) 5228: Part 1: 2009 and ISO9613:1996 (Acoustics - Attenuation of sound during propagation outdoors' -Part 2: General method of calculation).

We would like to commence the noise monitoring the week commencing 18th July, therefore we would appreciate a response to this letter at your earliest convenience.

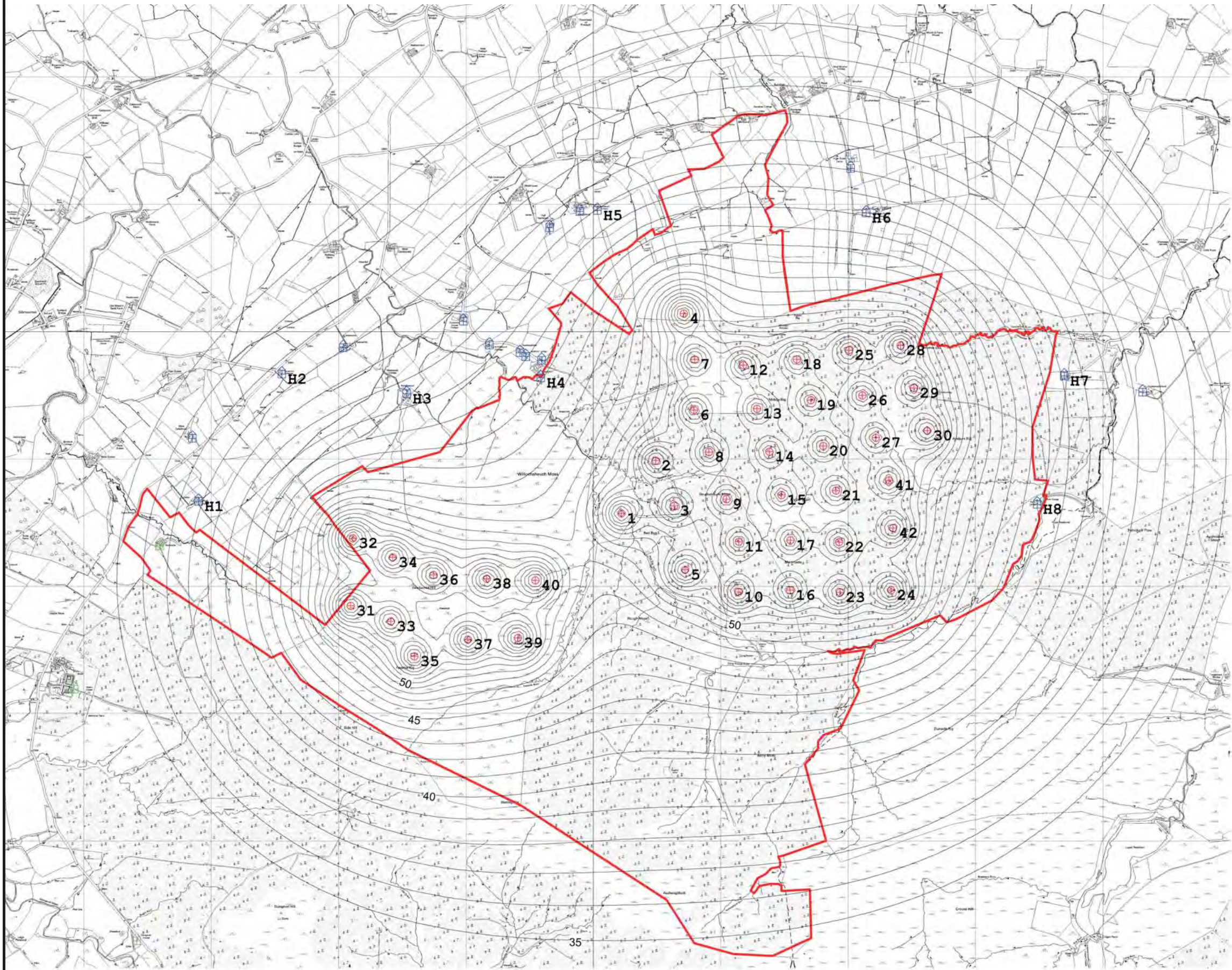
If you have any concerns or queries, please do not hesitate to contact me or my colleague [redacted] We look forward to hearing from you soon.

Yours sincerely

[redacted]

[redacted]
Technical Consultant

Enc. Figure 1 - Proposed Noise Monitoring Locations
cc [redacted]



Legend



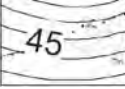
Proposed Noise Monitoring Locations



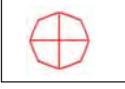
Noise sensitive receptors



Sensitive receptors already assessed as part of the Dungavel Windfarm Planning Application



Predicted Turbine Noise dB(A), L_{90} at $10ms^{-1}$ at 10m height based on the Siemens SWT 93, 2.3MW turbine



Proposed Turbine Locations



Site Boundary



| | |
|--------------------|-------------------------------------|
| Project | Proposed Kype Muir Windfarm |
| Client | Banks Renewables Ltd |
| Title | Proposed Noise Monitoring Locations |
| Figure Number | 1 |
| Scale | NTS |
| Drawn | GC |
| Checked | JM |
| Date | July 2010 |
| Document Reference | 6596-04-N-002 |



[redacted]

From: [redacted]
Sent: 12 July 2010 14:50
To: [redacted] [redacted]
Cc: [redacted]
Subject: RE: 6596 - Proposed wind farm at Kype Muir - Noise Assessment

Dear [redacted]

Thank you for your email and comments. I can confirm that the noise impact assessment will fully justify the choice of daytime fixed minimum limits.

We hope to commence the noise assessment within the next few weeks and will provide you with an update then.

Kind regards

[redacted]
[redacted]
Technical Consultant

TNEI Services Ltd.

[redacted]
t: [redacted]
[redacted] +44(0) 191 211 1432
w: www.tnei.co.uk

Floor B, Milburn House, Dean Street, Newcastle upon Tyne, NE1 1LE

Registered in England & Wales No 03891836.

Registered office: 39-49 Commercial Road, Southampton, Hampshire, SO15 1GA

From: [redacted] [redacted]
Sent: 12 July 2010 14:08
To: [redacted]
Subject: RE: 6596 - Proposed wind farm at Kype Muir - Noise Assessment

Dear Gemma,

Thank you for your email and the hard copy of the letter which I received on 8 July. With regard to the information contained therein, I would confirm that I am satisfied with the background noise monitoring locations and the proposed methodology for noise monitoring at the windfarm site. The use of the reference document ETSU-R-97 The assessment and rating of noise from windfarms (1996) is considered appropriate as is the use of BS5228:2009. Noise control on construction and open sites for the assessment of noise from the construction phase of the development.

With regard to the statement on page two where it is stated that '... we anticipate that the 40dB(A) noise limit will be more appropriate to this site,,,', this requires to be fully justified within the noise impact assessment to demonstrate why it is considered more appropriate than a limit of 35dB(A).

I trust this is of assistance and should you wish to discuss the matter, please do not hesitate to contact me.

Regards

[redacted]
[redacted]
Environmental Health Officer

12/01/2011

South Lanarkshire Council
Atholl House
East Kilbride G74 1LU
Tel [redacted]

Website: www.southlanarkshire.gov.uk

From: [redacted] [redacted]

Sent: 06 July 2010 09:30

To: [redacted] [redacted] [redacted] a [redacted] [redacted] [redacted]

Subject: 6596 - Proposed wind farm at Kype Muir - Noise Assessment

Dear [redacted]

Further to our telephone conversation earlier regarding the proposed windfarm at Kype Muir, please find attached a letter and plan detailing the proposed noise monitoring locations and assessment methodology for your consideration. Prior to commencing the noise survey we would like to agree with you suitable locations at which to monitor background noise levels to provide representative data for the area. We would like to commence the noise monitoring the week commencing 18th July 2010 so would appreciate a response to this letter at your earliest convenience.

Should you have any queries please do not hesitate to contact me or my colleagues James Mackay [redacted] or Stephen Arnott [redacted]. I will send a hard copy of the letter and plan in the post today.

Regards

[redacted]

[redacted]
Technical Consultant

TNEI Services Ltd.

Direct Dial: [redacted]

t: + [redacted]
[redacted] +44(0) 191 211 1432

w: www.tnei.co.uk

Floor B, Milburn House, Dean Street, Newcastle upon Tyne, NE1 1LE

Registered in England & Wales No 03891836.

Registered office: 39-49 Commercial Road, Southampton, Hampshire, SO15 1GA

_____ Information from ESET NOD32 Antivirus, version of virus signature database 5253
(20100705) _____

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

PLEASE NOTE: THE ABOVE MESSAGE WAS RECEIVED FROM THE INTERNET.

On entering the GSi, this email was scanned for viruses by the Government Secure Intranet (GSi)

12/01/2011

APPENDIX 3 - Calibration/ Conformance Certificates



CERTIFICATE OF CALIBRATION

Certificate Number CAL120905

Date of Issue 03/12/2009

Customer TNEI Services Ltd

Description of Instrument

Sound Level Meter Rion NL-32 Sound Level Meter [Serial No. 00661768] with Rion UC-53A Microphone [Serial No. 310459] and Rion NH-21 Preamplifier [Serial No. 19772] Fitted with a WS-10 foam windshield.

The instrument successfully completed the Class 1 Periodic Tests of BS EN 61672.

Associated Calibrator Rion NC-74 [Serial No. 34973250] with 1/2" adaptor type NC-74-002 fitted. This calibrator was calibrated by ANV Measurement Systems on 02/12/09 [Certificate No. CAL120902].

Date of Calibration 03/12/2009.

Test Procedure ..\..\Calibration Results Sheets\Current Approved Results Sheets\NL-31 Master 61672-3 Approved Issue 6 (BK 1445373).xls

Test procedures in accordance with BS EN 61672-3:2006.
NOTE: Test 10.1 (Self Generated Noise with Microphone Installed) omitted.

Test Engineer



APPROVED SIGNATORY [redacted]

[Redacted signature] ☐ / [Redacted signature] ☒

BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 ☎ 01908 642814

✉ info@noise-and-vibration.co.uk 🌐 www.noise-and-vibration.co.uk

ACOUSTICS NOISE AND VIBRATION LIMITED. REGISTERED IN ENGLAND NO. 3549028. REGISTERED OFFICE AS ABOVE.

CERTIFICATE OF CALIBRATION



CERTIFICATE NO. CAL120905.
DATE OF ISSUE 03/12/2009.

Information relating to the operation and adjustment of the sound level meter were obtained from the data contained in the Rion Instruction Manual 32005 and associated Technical Notes 32042. Additional information relating to measurement uncertainties required by clause 11.3 has been provided by the Rion European Office and is available for inspection upon request.

Results

Tests on the Sound Level Meter were principally performed on the Main Channel. Limited tests were also performed using the Sub-Channel.

When the Acoustic Calibrator supplied with the instrument was applied the Sound Level Meter initially read 94.1dB (A). The meter was adjusted to read 94.0 dB (A) derived from the supplied calibration certificate for the calibrator at the indicated frequency of 1000 Hz.

The environmental conditions at the start and end of the calibration were within the specified range for calibration and were noted to be as follows:

| Conditions | Measured Value at Start | Measured Value at End |
|----------------------|-------------------------|-----------------------|
| Temperature | 23.0 °C | 23.8 °C |
| Relative Humidity | 34.3 % | 39.1 % |
| Atmospheric Pressure | 98.7 kPa | 98.7 kPa |

The self generated noise levels of the instrument with the microphone replaced by the electrical input device were:

10.4 dB (A);
17.7 dB (C); and
23.0 dB (Z).

These measured levels were within the specified limits defined within the instruction manual.

The Sound Level Meter submitted for testing has successfully completed the Class 1 Periodic Tests of BS EN 61672, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about the conformance of the Sound Level Meter to the full requirements of BS EN 61672-1:2003 because evidence was not publically available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements of BS EN 61672-1:2003 and because the periodic tests of BS EN 61672-3:2006 only cover a limited subset of the specifications in BS EN 61672-1:2003.

The calibration incorporated the windshield corrections supplied by the manufacturer and the results are therefore applicable to the instrument with the microphone and pre-amplifier attached with the windscreen fitted.

CERTIFICATE OF CALIBRATION



CERTIFICATE NO. CAL120905.
DATE OF ISSUE 03/12/2009.

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer of the Sound Level Meter, or the manufacturer of the Microphone, or the manufacturer of the multi-frequency Sound Calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the Sound Level Meter may not conform to the requirements of IEC 61672-1:2002.

The total expanded measurement uncertainties associated with the calibration equipment and procedures is based on a standard uncertainty multiplied by a coverage factor $k=2$ to provide a confidence of approximately 95% in the results. The assessment of uncertainty has been carried out in accordance with national and international guidance upon the calculation of uncertainties in metrology.

Notes

1. The tests were conducted principally on the main channel, with a limited number of tests conducted for the sub channel. The Peak C sound level measurements were carried out for the sub channel as they are only available on this channel.
2. The instrument was running firmware version 1.009.



CERTIFICATE OF CALIBRATION

Certificate Number CAL120906

Date of Issue 03/12/2009

Customer TNEI Services Ltd

Description of Instrument

Sound Level Meter Rion NL-32 Sound Level Meter [Serial No. 00661769] with Rion UC-53A Microphone [Serial No. 310460] and Rion NH-21 Preamplifier [Serial No. 19773] Fitted with a WS-10 foam windshield.

The instrument successfully completed the Class 1 Periodic Tests of BS EN 61672.

Associated Calibrator Rion NC-74 [Serial No. 35173441] with 1/2" adaptor type NC-74-002 fitted. This calibrator was calibrated by ANV Measurement Systems on 02/12/09 [Certificate No. CAL120903].

Date of Calibration 03/12/2009.

Test Procedure ..\..\Calibration Results Sheets\Current Approved Results Sheets\NL-31 Master 61672-3 Approved Issue 6 (BK 1445373).xls

Test procedures in accordance with BS EN 61672-3:2006.
NOTE: Test 10.1 (Self Generated Noise with Microphone Installed) omitted.

Test Engineer [REDACTED]

APPROVED SIGNATORY [redacted]

[REDACTED] / [REDACTED] 

BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 ☎ 01908 642814

✉ info@noise-and-vibration.co.uk 🌐 www.noise-and-vibration.co.uk

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CERTIFICATE OF CALIBRATION



CERTIFICATE NO. CAL120906.
DATE OF ISSUE 03/12/2009.

Information relating to the operation and adjustment of the sound level meter were obtained from the data contained in the Rion Instruction Manual 32005 and associated Technical Notes 32042. Additional information relating to measurement uncertainties required by clause 11.3 has been provided by the Rion European Office and is available for inspection upon request.

Results

Tests on the Sound Level Meter were principally performed on the Main Channel. Limited tests were also performed using the Sub-Channel.

When the Acoustic Calibrator supplied with the instrument was applied the Sound Level Meter initially read 94.1dB (A). The meter was adjusted to read 94.0 dB (A) derived from the supplied calibration certificate for the calibrator at the indicated frequency of 1000 Hz.

The environmental conditions at the start and end of the calibration were within the specified range for calibration and were noted to be as follows:

| Conditions | Measured Value at Start | Measured Value at End |
|----------------------|-------------------------|-----------------------|
| Temperature | 23.0 °C | 23.4 °C |
| Relative Humidity | 35.1 % | 38.0 % |
| Atmospheric Pressure | 98.7 kPa | 98.8 kPa |

The self generated noise levels of the instrument with the microphone replaced by the electrical input device were:

9.9 dB (A);
17.3 dB (C); and
22.5 dB (Z).

These measured levels were within the specified limits defined within the instruction manual.

The Sound Level Meter submitted for testing has successfully completed the Class 1 Periodic Tests of BS EN 61672, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about the conformance of the Sound Level Meter to the full requirements of BS EN 61672-1:2003 because evidence was not publically available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements of BS EN 61672-1:2003 and because the periodic tests of BS EN 61672-3:2006 only cover a limited subset of the specifications in BS EN 61672-1:2003.

The calibration incorporated the windshield corrections supplied by the manufacturer and the results are therefore applicable to the instrument with the microphone and pre-amplifier attached with the windscreen fitted.

CERTIFICATE OF CALIBRATION



CERTIFICATE NO. **CAL120906.**
DATE OF ISSUE **03/12/2009.**

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer of the Sound Level Meter, or the manufacturer of the Microphone, or the manufacturer of the multi-frequency Sound Calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the Sound Level Meter may not conform to the requirements of IEC 61672-1:2002.

The total expanded measurement uncertainties associated with the calibration equipment and procedures is based on a standard uncertainty multiplied by a coverage factor $k=2$ to provide a confidence of approximately 95% in the results. The assessment of uncertainty has been carried out in accordance with national and international guidance upon the calculation of uncertainties in metrology.

Notes

1. The tests were conducted principally on the main channel, with a limited number of tests conducted for the sub channel. The Peak C sound level measurements were carried out for the sub channel as they are only available on this channel.
2. The instrument was running firmware version 1.009.



CERTIFICATE OF CALIBRATION

Certificate Number CAL120907

Date of Issue 04/12/2009

Customer TNEI Services Ltd

Description of Instrument

Sound Level Meter Rion NL-32 Sound Level Meter [Serial No. 00861870] with Rion UC-53A Microphone [Serial No.310623] and Rion NH-21 Preamplifier [Serial No.21093] Fitted with a WS-10 foam windshield.

The instrument successfully completed the Class 1 Periodic Tests of BS EN 61672.

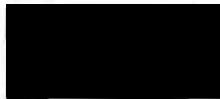
Associated Calibrator B & K 4226 S/N 1445373.

Date of Calibration 04/12/2009.

Test Procedure ..\..\Calibration Results Sheets\Current Approved Results Sheets\NL-31 Master 61672-3 Approved Issue 6 (BK 1445373).xls

Test procedures in accordance with BS EN 61672-3:2006.
NOTE: Test 10.1 (Self Generated Noise with Microphone Installed) omitted.

Test Engineer



APPROVED SIGNATORY [redacted]



BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 📠 01908 642814

✉ info@noise-and-vibration.co.uk 🌐 www.noise-and-vibration.co.uk

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CERTIFICATE OF CALIBRATION



CERTIFICATE NO. CAL120907.
DATE OF ISSUE 04/12/2009.

Information relating to the operation and adjustment of the sound level meter were obtained from the data contained in the Rion Instruction Manual 32005 and associated Technical Notes 32042. Additional information relating to measurement uncertainties required by clause 11.3 has been provided by the Rion European Office and is available for inspection upon request.

Results

Tests on the Sound Level Meter were principally performed on the Main Channel. Limited tests were also performed using the Sub-Channel.

No Acoustic Calibrator was supplied with the instrument. When ANV Measurement Systems' B&K 4226 s/n 1445373 was initially applied the Sound Level Meter read 94.0dB (A). The meter was adjusted to read 93.9 dB (A) derived from the current calibration certificate for the calibrator at the indicated frequency of 1000 Hz.

The environmental conditions at the start and end of the calibration were within the specified range for calibration and were noted to be as follows:

| Conditions | Measured Value at Start | Measured Value at End |
|----------------------|-------------------------|-----------------------|
| Temperature | 21.0 °C | 23.9 °C |
| Relative Humidity | 35.5 % | 33.7 % |
| Atmospheric Pressure | 99.7 kPa | 99.9 kPa |

The self generated noise levels of the instrument with the microphone replaced by the electrical input device were:

10.0 dB (A);
17.7 dB (C); and
22.7 dB (Z).

These measured levels were within the specified limits defined within the instruction manual.

The Sound Level Meter submitted for testing has successfully completed the Class 1 Periodic Tests of BS EN 61672, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about the conformance of the Sound Level Meter to the full requirements of BS EN 61672-1:2003 because evidence was not publically available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements of BS EN 61672-1:2003 and because the periodic tests of BS EN 61672-3:2006 only cover a limited subset of the specifications in BS EN 61672-1:2003.

The calibration incorporated the windshield corrections supplied by the manufacturer and the results are therefore applicable to the instrument with the microphone and pre-amplifier attached with the windscreen fitted.

CERTIFICATE OF CALIBRATION



CERTIFICATE NO. **CAL120907.**
DATE OF ISSUE **04/12/2009.**

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer of the Sound Level Meter, or the manufacturer of the Microphone, or the manufacturer of the multi-frequency Sound Calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the Sound Level Meter may not conform to the requirements of IEC 61672-1:2002.

The total expanded measurement uncertainties associated with the calibration equipment and procedures is based on a standard uncertainty multiplied by a coverage factor $k=2$ to provide a confidence of approximately 95% in the results. The assessment of uncertainty has been carried out in accordance with national and international guidance upon the calculation of uncertainties in metrology.

Notes

1. The tests were conducted principally on the main channel, with a limited number of tests conducted for the sub channel. The Peak C sound level measurements were carried out for the sub channel as they are only available on this channel.
2. The instrument was running firmware version 1.0009.



CERTIFICATE OF CALIBRATION

Certificate Number CAL120908

Date of Issue 04/12/2009

Customer TNEI Services Ltd

Description of Instrument

Sound Level Meter Rion NL-32 Sound Level Meter [Serial No. 00861871] with Rion UC-53A Microphone [Serial No.310625] and Rion NH-21 Preamplifier [Serial No.21094] Fitted with a WS-10 foam windshield.

The instrument successfully completed the Class 1 Periodic Tests of BS EN 61672.

Associated Calibrator B & K 4226 S/N 1445373.

Date of Calibration 04/12/2009.

Test Procedure ...\\Calibration Results Sheets\\Current Approved Results Sheets\\NL-31 Master 61672-3 Approved Issue 6 (BK 1445373).xls

Test procedures in accordance with BS EN 61672-3:2006.
NOTE: Test 10.1 (Self Generated Noise with Microphone Installed) omitted.

Test Engineer



APPROVED SIGNATORY [redacted]



BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 📠 01908 642814

✉ info@noise-and-vibration.co.uk 🌐 www.noise-and-vibration.co.uk

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CERTIFICATE OF CALIBRATION



CERTIFICATE NO. CAL120908.
DATE OF ISSUE 04/12/2009.

Information relating to the operation and adjustment of the sound level meter were obtained from the data contained in the Rion Instruction Manual 32005 and associated Technical Notes 32042. Additional information relating to measurement uncertainties required by clause 11.3 has been provided by the Rion European Office and is available for inspection upon request.

Results

Tests on the Sound Level Meter were principally performed on the Main Channel. Limited tests were also performed using the Sub-Channel.

No Acoustic Calibrator was supplied with the instrument. When ANV Measurement Systems' B&K 4226 s/n 1445373 was initially applied the Sound Level Meter read 94.0dB (A). The meter was adjusted to read 93.9 dB (A) derived from the current calibration certificate for the calibrator at the indicated frequency of 1000 Hz.

The environmental conditions at the start and end of the calibration were within the specified range for calibration and were noted to be as follows:

| Conditions | Measured Value at Start | Measured Value at End |
|----------------------|-------------------------|-----------------------|
| Temperature | 23.0 °C | 23.2 °C |
| Relative Humidity | 32.5 % | 35.1 % |
| Atmospheric Pressure | 99.9 kPa | 99.9 kPa |

The self generated noise levels of the instrument with the microphone replaced by the electrical input device were:

12.9 dB (A);
19.3 dB (C); and
24.6 dB (Z).

These measured levels were within the specified limits defined within the instruction manual.

The Sound Level Meter submitted for testing has successfully completed the Class 1 Periodic Tests of BS EN 61672, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about the conformance of the Sound Level Meter to the full requirements of BS EN 61672-1:2003 because evidence was not publically available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements of BS EN 61672-1:2003 and because the periodic tests of BS EN 61672-3:2006 only cover a limited subset of the specifications in BS EN 61672-1:2003.

The calibration incorporated the windshield corrections supplied by the manufacturer and the results are therefore applicable to the instrument with the microphone and pre-amplifier attached with the windscreen fitted.

CERTIFICATE OF CALIBRATION



CERTIFICATE NO. **CAL120908.**
DATE OF ISSUE **04/12/2009.**

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer of the Sound Level Meter, or the manufacturer of the Microphone, or the manufacturer of the multi-frequency Sound Calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the Sound Level Meter may not conform to the requirements of IEC 61672-1:2002.

The total expanded measurement uncertainties associated with the calibration equipment and procedures is based on a standard uncertainty multiplied by a coverage factor $k=2$ to provide a confidence of approximately 95% in the results. The assessment of uncertainty has been carried out in accordance with national and international guidance upon the calculation of uncertainties in metrology.

Notes

1. The tests were conducted principally on the main channel, with a limited number of tests conducted for the sub channel. The Peak C sound level measurements were carried out for the sub channel as they are only available on this channel.
2. The instrument was running firmware version 1.0009.



CERTIFICATE OF CALIBRATION

Certificate Number CAL120909
Date of Issue 04/12/2009
Customer TNEI Services Ltd

Description of Instrument

Sound Level Meter Rion NL-32 Sound Level Meter [Serial No. 00482652] with Rion UC-53A Microphone [Serial No.314027] and Rion NH-21 Preamplifier [Serial No.27756] Fitted with a WS-10 foam windshield.

The instrument successfully completed the Class 1 Periodic Tests of BS EN 61672.

Associated Calibrator B & K 4226 S/N 1445373.

Date of Calibration 04/12/2009.

Test Procedure ..\..\Calibration Results Sheets\Current Approved Results Sheets\NL-31 Master 61672-3 Approved Issue 6 (BK 1445373).xls

Test procedures in accordance with BS EN 61672-3:2006.
NOTE: Test 10.1 (Self Generated Noise with Microphone Installed) omitted.

Test Engineer [REDACTED]

APPROVED SIGNATORY ... [redacted]

[REDACTED] □ / [REDACTED] □

BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 ☎ 01908 642814

✉ info@noise-and-vibration.co.uk 💻 www.noise-and-vibration.co.uk

ACOUSTICS NOISE AND VIBRATION LIMITED. REGISTERED IN ENGLAND NO. 3549028. REGISTERED OFFICE AS ABOVE.

CERTIFICATE OF CALIBRATION



CERTIFICATE NO. CAL120909.
DATE OF ISSUE 04/12/2009.

Information relating to the operation and adjustment of the sound level meter were obtained from the data contained in the Rion Instruction Manual 32005 and associated Technical Notes 32042. Additional information relating to measurement uncertainties required by clause 11.3 has been provided by the Rion European Office and is available for inspection upon request.

Results

Tests on the Sound Level Meter were principally performed on the Main Channel. Limited tests were also performed using the Sub-Channel.

No Acoustic Calibrator was supplied with the instrument. When ANV Measurement Systems' B&K 4226 s/n 1445373 was initially applied the Sound Level Meter read 94.0dB (A). The meter was adjusted to read 93.9 dB (A) derived from the current calibration certificate for the calibrator at the indicated frequency of 1000 Hz.

The environmental conditions at the start and end of the calibration were within the specified range for calibration and were noted to be as follows:

| Conditions | Measured Value at Start | Measured Value at End |
|----------------------|-------------------------|-----------------------|
| Temperature | 21.9 °C | 23.7 °C |
| Relative Humidity | 38.2 % | 35.9 % |
| Atmospheric Pressure | 99.8 kPa | 99.8 kPa |

The self generated noise levels of the instrument with the microphone replaced by the electrical input device were:

10.8 dB (A);
18.3 dB (C); and
23.5 dB (Z).

These measured levels were within the specified limits defined within the instruction manual.

The Sound Level Meter submitted for testing has successfully completed the Class 1 Periodic Tests of BS EN 61672, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about the conformance of the Sound Level Meter to the full requirements of BS EN 61672-1:2003 because evidence was not publically available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements of BS EN 61672-1:2003 and because the periodic tests of BS EN 61672-3:2006 only cover a limited subset of the specifications in BS EN 61672-1:2003.

The calibration incorporated the windshield corrections supplied by the manufacturer and the results are therefore applicable to the instrument with the microphone and pre-amplifier attached with the windscreen fitted.