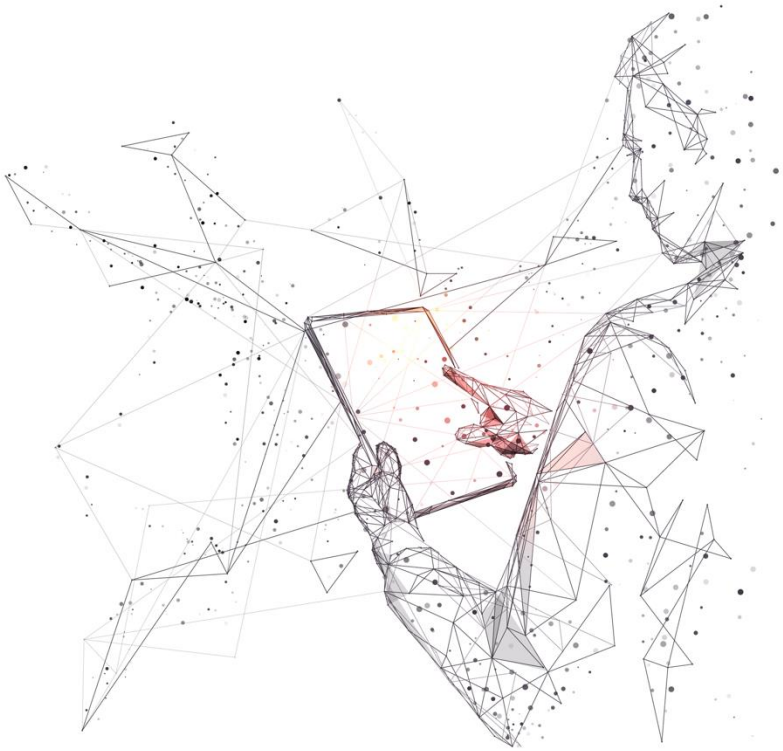
JUNE 8, 2022



Noise Impact Assessment for Cupral Processing Plant

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Document Information

Project Name	:	**NIA - 1 Gould Avenue, Riverside Park Rd**
Doc Reference	:	**E2CRCU0806**
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	Name	Qualifications	Initials	Date
Prepared by:	James Flitton	Associate Member Institute of Acoustics	JF	08/06/22
Completed by:	James Flitton	Associate Member Institute of Acoustics	JF	08/06/22
For and on behalf of E2 Consultants Ltd				
Signed:				

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Table of Contents

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1. Introduction

1.1 This report has been commissioned to determine both the current noise impact of the existing plant/processing noise on the nearest Noise Sensitive Receptor (NSR) locations, and also examine the possible impact of an extension of hours on the plant activity.

1.2 The survey will use BS4142:2014 for the noise assessment.

2.0 Site Details

2.0.1 The site is directly North-West of the A66 and adjacent on the West boundary to the River Tees.

2.0.2 The site is part of a currently expanding manufacturing/technology park containing several companies with various materials/manufacturing facilities.

2.0.3 The nearest Noise Sensitive Receptor (NSR) points are located directly to the South on Newport Road, and to the South East on Leven Street/Laycock Street.

2.0.4 The NSRs to the South East are directly behind and below the main roundabout junction off of and below the A66 route. This provides both a barrier and a direct noise source to these NSRs.

2.0.5 The NSRs to the South on Newport road have various buildings as shielding points, and other roads as noise sources. The Newport bridge also provides a noise source as it is a moving bridge.

2.0.6 The rest of the surrounding areas contain various industrial facilities that are not considered to be NSRs for this assessment.

2.0 Location of monitors

2.0.3 Location 1 - The first and main monitoring position was at the North East end of the site next to the main noise source – the extraction unit. This was to gain the noise impact value or specific noise source value for the unit at source to use in the noise prediction software, CadnaA. This was in place for 24hrs [Figure 1].

2.0.4 Location 2 – Service Yard to collect data on the noise output from the open roller shutters and the various plant machinery/haulage vehicles working through the day [Figure 2].

2.0.5 Location 3 – Day [Figure 4] and Night [Figure 3] spot readings taken on Newport Road to determine day and night background noise levels

Figure 1

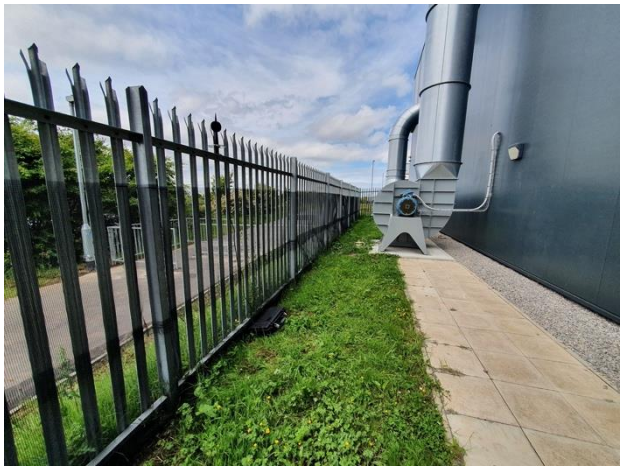


Figure 2

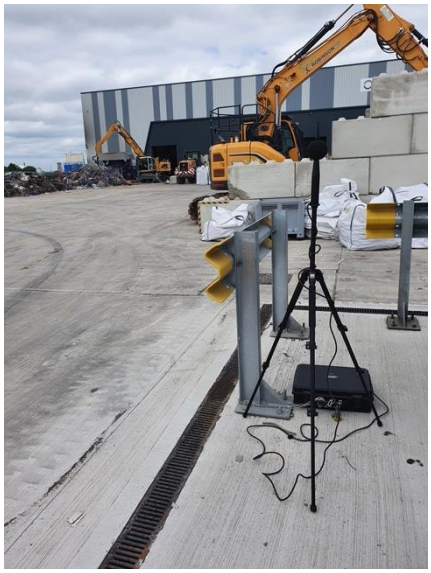


Figure 3

Figure 4

2.1.4 Measurements were made in 15 minute periods, on 1 second averaging, to allow for the removal of anomalies and increased accuracy. The data was averaged into L_{Aeq1hr} daytime and $L_{Aeq15min}$ night-time with data also recorded for L_{AMax} in both day and night periods for the BS4142:2014 assessment.

2.1.5 The monitoring was conducted using 2 x Type 1 NTI XL2 sound level meter, Tripod, outdoor case with batteries and outdoor microphone protection.

2.2.6 The measurements were taken by a fully qualified engineer with AMIOA status with the institute of Acoustics.

2.2.7 All measurements were taken after a field calibration was undertaken to ensure accuracy and repeatability of measurements.

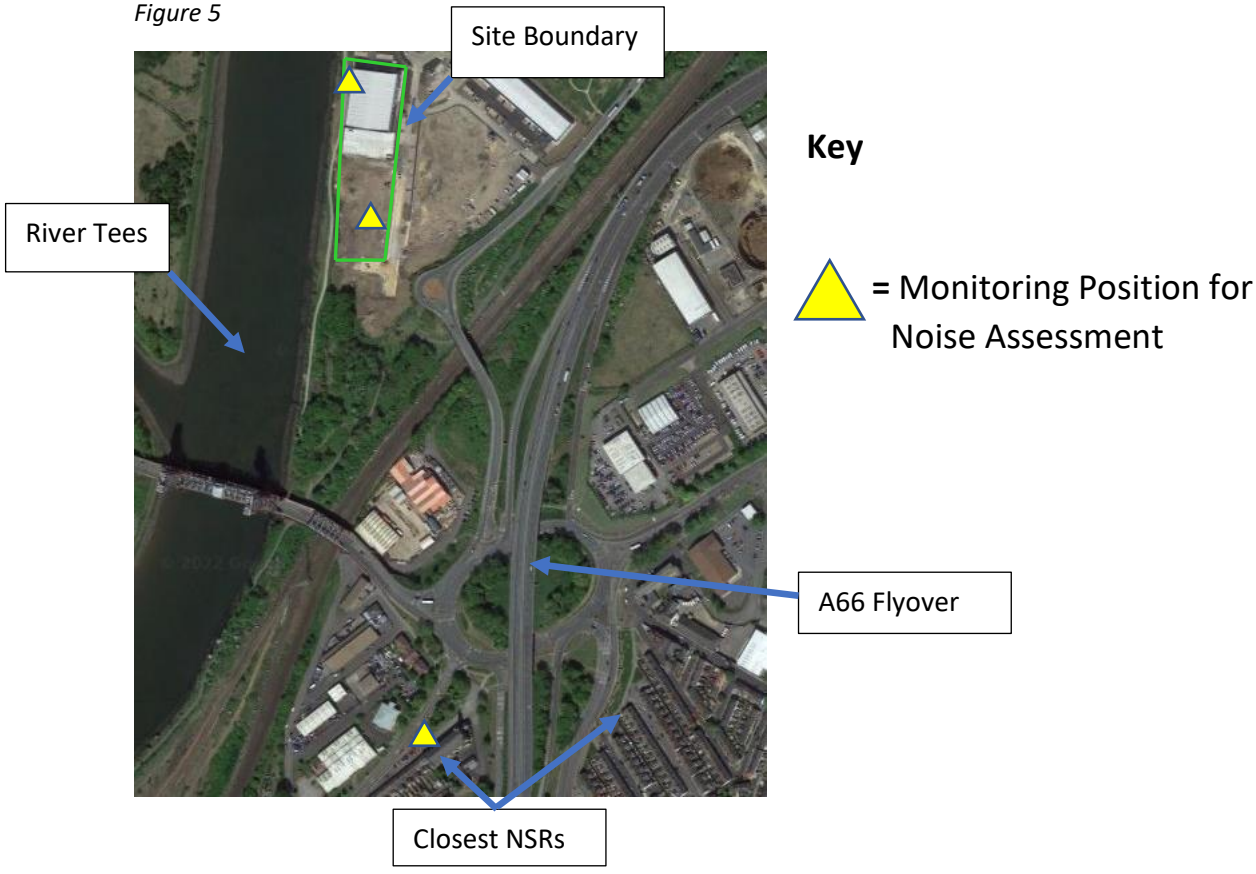
2.2.8 Further data such as wind speed, wind direction, rainfall intensity, temperature and cloud cover were all recorded at the beginning and end of the assessment at the monitoring location.

2.2.9 Any anomalies (such as noise by the engineer during setup and collection of the kit) were removed from the survey for a true reflection of the ambient levels in the vicinity. This was done by recording audio throughout the survey at each location and listening back through the files during the analysis process to confirm what was recorded manually during the survey.

2.2.10 Care was taken to inform any residents in the area that audio recording was taking place.

2.2 Plan Views of Site with Designated Work Areas

Figure 5



3.0 Legislation

3.0.1 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 170 of the NPPF states the following:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability."

Paragraph 180 goes on to mention:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;"

3.0.2 The NPPF reinforces the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life;
- and where possible, contribute to the improvement of health and quality of life."

3.0.3 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest

observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

> "... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

3.1 BS4142:2014 +A1 (2019)

3.1.1 Noise effects on residential properties due to the current operational hours and extended hours have been assessed according to the guidance in BS 4142:2014. This standard primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the 'specific sound' from the proposed development) at residential sensitive receptors.

3.1.2 The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the 'rating level', whether or not a rating penalty is applied. The 'residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.

3.1.3 According to BS 4142:2014, the background sound levels adopted for the assessment should be representative of the periods being assessed. The standard recommends that the background sound level should be collected from continuous measurements of normally not less than 15-minute intervals. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound levels between the shoulder night periods.

3.1.4 The method chosen for this section of the report is to use the data collected at the nearest NSR for the day and night periods to provide the ambient and background noise levels. The mode $L_{Aeq\_1hr(Day)}$ and $L_{Aeq\_15min(Night)}$) value will then be used for each time period over the course of the measurement as the most appropriate way of creating a representative value.

3.1.5 The specific sound levels have been determined separately in terms of the L_{Aeq1hr} during the daytime $L_{Aeq15min}$ during the night-time using the noise prediction software, CadnaA. Daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours, so these periods have been adopted for this assessment.

3.1.6 At each of the most likely sensitive receptor locations, the rating level has been determined from the predicted specific sound level. Where it has considered it to be appropriate, a rating penalty has been applied for tonality, impulsivity and/or intermittent specific sounds as described in the commentary to paragraph 9.2 of

BS4142:2014. This has been applied with consideration for the main sound sources from site that contribute to the level of specific sound at the receptor location.

3.1.7 As per the requirements of the standard, an initial estimate of the impact of the specific sound has been obtained by subtracting the measured background sound level from the rating level of the specific sound. Table 2 provides the initial evaluation of impact following this method.

Table 1

Magnitude	Difference Between rating Level and Background Level	Comments
High	**+10dB**	**Significant Adverse impact Likely**
Medium	**+5 to +10dB**	**Adverse impact Likely**
Low	**0 to +5 dB**	**Adverse impact unlikely**
Negligible	**Less than 0dB**	**Adverse impact unlikely**
No Change	**-10 dB**	**No adverse impact**

3.1.8 Following the initial evaluation of impact, the context of the sound has also been considered, which is a key requirement of the Standard. In evaluation of the context, the following factors have been considered:

- the absolute level of the sound;
- the character and level of the residual sound compared to the character and level of the specific sound and
- the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

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4.0 Results

4.1 – Location 1 (Extraction Unit)

Table 2

Location	Start Date/Time	L_{Amax}	L_{Aeq1hr} (Mode)	$L_{Aeq15min}$ (Mode)	L_{A90}
Main site Extraction Unit	**06/06/22 13.51pm**				
Day (0700-2300)		**96.3dBA**	**78.2dBA**		**77.1dBA**
Night (2300-0700)		**78.0dBA**		**48.5dBA**	**44.5dBA**

Figure 6

Comments

The extractor, is tonal as can be seen at the bottom of figure 6 at 25Hz.

**based on Appendix C*

Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
5	14.5 (1hr mode)	No	1.8	NE

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4.2 – Location 2 (Site Yard)

Table 3

Location	Start Date/Time	L_{Amax}	L_{Aeq1hr} (Mode)	L_{A90}
Main site Yard	**01/06/22 14.10pm**			
Day (0700-2300)		**96.6dBA**	**66.5dBA**	**65.3dBA**

Figure 7

Comments

There are no tones but impulsive noise is frequent

**based on Appendix C*

Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
5	13.5 (1hr mode)	No	2.3	NE

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4.3 – Location 3 (Newport Road - Day)

Table 4

Location	Start Date/Time	L_{Amax}	L_{Aeq1hr} (Mode)	L_{A90} (BS4142)
Newport Road (Day)	**07/06/22 09.51am**			
Day (0700-2300)		**88.9dBA**	**64.8dBA**	**61.4dBA**

Figure 7

Comments

Mainly traffic noise but alarm from bridge moving audible at 10am.

**based on Appendix C*

Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
3	11 (1hr mode)	No	0.4	E

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4.4 – Location 4 (Newport Road - Night)

Table 5

Location	Start Date/Time	L_{Amax}	$L_{Aeq15mins}$ (Mode)	L_{A90}
Newport Road (Night)	**06/06/22 10 23.00pm**			
Night (2300-0700)		**78.2dBA**	**62.5dBA**	**51.3dBA**

Figure 8

Comments

Mainly traffic pass-by noise. Measurement started before 11pm but only from 11pm until 12am used in calc figures. Very little drop in levels from day to night.

**based on Appendix C*

Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
7	6 (1hr mode)	No	0.5	NE

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5.0 Analysis of Results

5.1 Calculated results to BS4142:2014 (Generator Noise)

5.1.1 Table 6 shows the resulting figures for Day and Night according to BS4142.

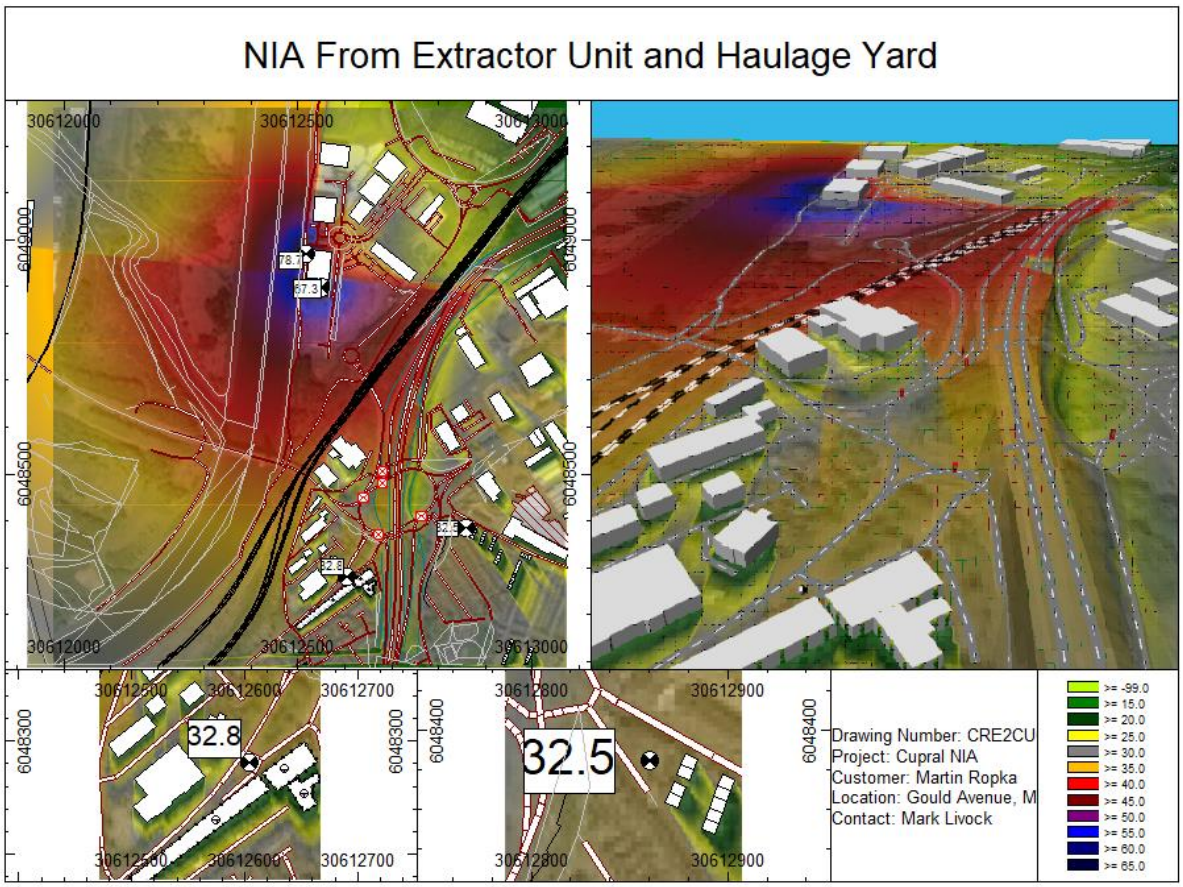
5.1.2 The measurement values from the extraction unit and the main site yard were used in the noise modelling software, CadnaA, as calibration points for the noise exposure from the site on the surrounding area.

5.1.3 This has then been used in the CadnaA noise modelling software to produce a modelled noise impact value at the two main identified noise sensitive receptor locations (NSRs) to the South-East and South-West of the production facility

5.1.4 The modelled values and comparisons made in table 6 look at the noise impact from running the site 24/7 on the site rather than just the current 6am through until 10pm. This does not account for background levels or any other sources in the area – just the impact from the proposed site.

5.1.5 CadnaA modelled values

Figure 9



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5.1.5 The highest modelled value (seen in figure 9 at the South West NSR) has then been used as part of the comparison for the BS4142 assessment in table 6.

Table 6

Measurement Type	Parameter	Result	Comment
Day			
Ambient sound	L_{Aeq}	**65dBA**	**Measured at NSR-Source present**
Residual sound level	L_{Aeq1hr}		
Background sound level	L_{A901hr}	**61dBA**	**Measured at NSR-Source present**
Specific Sound Level	L_{Aeq1hr}	**33dBA**	**Modelled**
Acoustic Feature Correction	**dBA**	**-**	**Impulsive noise likely from the site (although not audible at the NSR)**
Rating Level	**dBA**	**33dBA**	
Difference of Background vs Rating level	**dBA**	**-28dB**	
Likelihood of complaints			**No Adverse impact**
Night			
Ambient sound	L_{Aeq}	**63dBA**	**Measured at NSR-Source not present**
Residual sound level	$L_{Aeq15mins}$	**63dBA**	**Measured at NSR-Source not present**
Background sound level	$L_{A9015mins}$	**51dBA**	**Measured at NSR**
Specific Sound Level	$L_{Aeq15mins}$	**33dBA**	**Modelled**
Acoustic Feature Correction	**dBA**	**-**	**Impulsive noise likely from the site but not audible at this distance to NSR**
Rating Level	**dBA**	**33dBA**	
Difference of Background vs Rating level	**dBA**	**-18dB**	**No Adverse impact**
Likelihood of complaints			

5.1.6 From the results in table 6 it can be seen that there is no adverse impact from the site. This is both under current working/operational hours of 6am-10pm, and also if this was extended to the full 24hours (or any period through the night), there is no likelihood of adverse impact on local residents.

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6.0 Conclusion and Further Comments

6.1 Discussion of Levels

6.1.1 The large distance and the amount of screening objects and noise sources between the Cupral facility and the nearest sensitive receptor point means that there is no chance of adverse impact from the site.

6.1.2 It can also be seen that with a difference of 18dB between the specific noise level and the background noise level at night – there would be no adverse impact from an extension of hours.

6.1.3 There would have to be a significant drop in the background noise level for there to be any chance of adverse impact. The A66 is the main noise source in the area, as well as busy residential roads in the vicinity. The traffic levels on these roads would need to reduce drastically for the background noise to be anywhere near enough to be a concern. Levels of 30dB background are usually more attributed to rural areas whereas this section of Middlesbrough is very much an industrial hub.

7.0 Credentials

Name	Title	Credentials
James Flitton BSc AMIOA	**Technical Director**	**CSCS Professionally Qualified person**
		Associate Member Institute of Acoustics
		Affiliate Member of IDE
		Affiliate Member of IOR

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Appendix A – Acoustic Terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A –weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B - Certificates of Calibration

Manufacturer Calibration Certificate

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3. All tests are traceable in accordance with ISO/IEC 17025.

This model of sound level meter submitted for periodic testing successfully completed the applicable pattern-evaluation tests given in IEC 61672-2. The pattern approval certificate is available at www.nti-audio.com/XL2.

Sound Level Meter

Manufacturer	NTi Audio		
Type	XL2-TA	S/N	A2A-18928-E0
Firmware	V4.21		
Reference Level Range	mid		
Microphone Model	M2230		
Preamplifier	MA220	S/N	9785
Microphone Capsule	MC230A	S/N	A20919
Performance class	Class 1		
Customer Inventory Nr.			

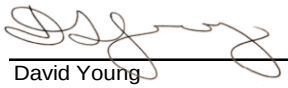
Customer

Crimson Remote Services Ltd
38 Potter Street
Worksop
Nottinghamshire
S80 2AQ

Date 26 April 2021

Certificate UK-21-029

Results **PASSED**
(for detailed report see next pages)

Operator 
David Young

NTi AUDIO

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Sound Level Meter

Manufacturer	NTi Audio		
Type	XL2-TA	S/N	A2A-18475-E0
Firmware	V4.21		
Reference Level Range	mid		
Microphone Model	M2230		
Preamplifier	MA220	S/N	9378
Microphone Capsule	MC230A	S/N	A19093
Performance class	Class 1		
Customer Inventory Nr.			

Customer

Date 13 October 2020

Certificate UK-20-072

Results **PASSED**
(for detailed report see next pages)

Operator David Young

NTi Audio UK Ltd • Office 33C Julians Road • Stevenage
Hertfordshire, SG1 3ES, UK • uk@nti-audio.com

NTi AUDIO

Manufacturer Calibration Certificate

The following instrument has been tested and calibrated to the manufacturer specifications.
The calibration is traceable in accordance with ISO/IEC 17025 covering all instrument functions.

- Device Type: **Class 1 Sound Calibrator CAL200**
- Serial Number: **17656**

- Date of Calibration: **13 October 2020**
- Certificate Number: **44117-17656-CAL200**
- Results: **PASSED**
  (for detailed report see next page)

Tested by: D.Young

Signature:

NTi Audio UK Ltd, Office 33C Julians Road, Stevenage, Hertfordshire, SG1 3ES Tel No: +44 (0) 1438 870632
email: uk@nti-audio.com Web: www.nti-audio.com VAT Number 314751712

1/2

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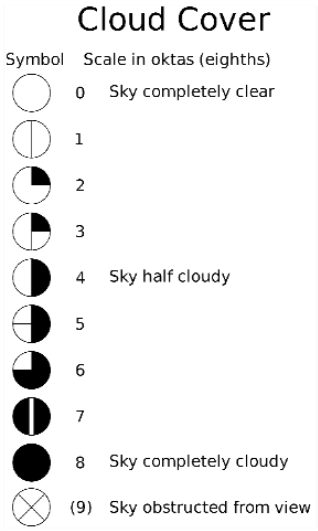
Appendix C – Weather Conditions Chart Used

<table>
<tr><th colspan="5">Weather Conditions</th></tr>
<tr><th>Measurement Location</th><th>Date/Time</th><th>Description</th><th>Beginning of Survey</th><th>End of Survey</th></tr>
<tr><td>As indicated on</td><td></td><td>Temperature:</td><td></td><td></td></tr>
<tr><td colspan="2" rowspan="8"> 
</td><td>Precipitation:</td><td></td><td></td></tr>
<tr><td>Cloud cover (oktas - see guide)</td><td></td><td></td></tr>
<tr><td>Presence of fog/snow/ice</td><td></td><td></td></tr>
<tr><td>Presence of damp roads/wet ground</td><td></td><td></td></tr>
<tr><td>Wind Speed (m/s)</td><td></td><td></td></tr>
<tr><td>Wind Direction</td><td></td><td></td></tr>
<tr><td>Conditions that may cause temperature inversion (i.e. calm nights with no cloud)</td><td></td><td></td></tr>
</table>