

S.73 APPLICATION TO VARY CONDITIONS 3 AND 4

ENVIRONMENTAL STATEMENT ADDENDUM

CHAPTER 20: BLAST VIBRATION

**Ffos-y-Fran Land Reclamation Scheme, East of Merthyr Tydfil
CF48 4AE**

Merthyr (South Wales) Limited

SLR Ref: 419.08882.00002
Version No: DRAFT V1
July 2022



BASIS OF REPORT

This document has been prepared by SLR Consulting Limited with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with Merthyr (South Wales) Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

CONTENTS

20.1.0 INTRODUCTION	1
S.73 Application Context	1
Consideration of S.73 Application	1
Purpose and Structure of Chapter	2
20.2.0 METHODOLOGY	3
Changes in Legislation, Guidance and Planning Policy.....	3
Assessment Methodology	5
Effects Not Requiring Further Assessment.....	7
20.3.0 CHANGES IN BASELINE CONDITIONS.....	8
Original ES Baseline	8
Original ES Future Baseline	8
Changes in Baseline	8
20.4.0 ASSESSMENT OF EFFECTS	9
Additional Effects	9
Additional Cumulative Effects	9
Consideration of Original ES.....	9
20.5.0 REQUIREMENT FOR ADDITIONAL MITIGATION OR MONITORING	10
Original ES Mitigation.....	10
Subsequent Mitigation or Monitoring	10
Alternate or Additional Mitigation and Monitoring.....	11
20.6.0 RESIDUAL EFFECTS	12
Consideration of Original ES.....	12
20.7.0 OTHER ENVIRONMENTAL ISSUES.....	13
Other Environmental Issues of Relevance	13
Summary	13
20.8.0 SUMMARY OF EFFECTS	14
20.9.0 CONCLUSIONS	15

DOCUMENT REFERENCES

TABLES

Table 20-1 Sensitivity Criteria..... 5

Table 20-2 Magnitude of Change (Impact)..... 6

Table 20-3 Significance of Effect 7

APPENDICES

Appendix 20-1: Glossary of Terminology

Appendix 20-2: Receptor Locations

20.1.0 Introduction

S.73 Application Context

- 20.1.1 Planning permission for the operational surface coal mine at Ffos-y-Fran ('the Site') was originally granted under ref. A-PP 152-07-014 ('the original application'). The description of development was as follows:

"Application by Miller Argent (South Wales) Limited for the Ffos-y-Fran Land Reclamation Scheme, incorporating the extraction of coal by open cast methods, and being the final phase of the east Merthyr Reclamation Scheme."

- 20.1.2 The above permission was subsequently varied under a S.73 planning application (application ref. P/08/0316) which sought consent for:

"[The] Variation of condition 37 of planning permission A-PP 152-07-014 to permit the limited dispatch by road of up to 5% of the annual output of coal from the Ffos-y-Fran land reclamation scheme or a maximum of 50,000 tonnes of coal per annum (whichever is the lesser) via Cwmbargoed Disposal Point."

- 20.1.3 The application was refused by Merthyr Tydfil County Borough Council but the proposals were subsequently allowed at Appeal (Appeal ref. APP/U6925/A/10/2129921). The Appeal Decision was issued by an appointed Inspector on the 11th of March 2011 and contained a comprehensive list of updated conditions, thereby superseding the original planning permission for the site as detailed above (permission ref. A-PP 152-07-014).

- 20.1.4 The purpose of this S.73 application is to allow for an extension to the lifespan of the mine. As such, the application seeks to vary the following conditions as contained within Appeal ref. APP/U6925/A/10/2129921:

- **Condition 3** – "All coal extraction from the development hereby permitted shall cease no later than 06 September 2022"; and
- **Condition 4** – "Final restoration of the land shall be completed no later than 06 December 2024 and aftercare shall be undertaken for a period of not less than 5 years upon certification of completion of each phase of the progressive restoration scheme."

- 20.1.5 The S.73 application, as submitted, seeks to extend the lifespan of the mineral's extraction by a further 9 months. As such, the timescales stipulated within the above conditions will be varied to match this extended life span for the mine. No alterations are proposed to the extraction area or working practices at the mine as previously consented.

- 20.1.6 Whilst reasonable effort has been made to make this report easily understandable, it is technical in nature. To assist the reader, a glossary of acoustic terminology has been included in **Appendix 20-1**.

Consideration of S.73 Application

- 20.1.7 The following needs to be reviewed regarding blast vibration on the context of the proposed Material Amendment:

- Review of any changes in Legislation, Guidance and Planning Policy to determine whether any changes in these documents would alter the conclusions of the original application and relevant chapters within the original Environmental Statement (ES).
- Review of the baseline environment to determine whether this is likely to have significantly changed since the original application which in turn could alter the conclusions of the original application and relevant chapters within the original ES.
- Review of the methodology identified impacts, mitigation measures and conclusions of the original ES in conjunction with the review of legislation and baseline environment to determine whether these remain valid and if there is a requirement for further assessment for the Section 73 application.

20.1.8 The following information relating to vibration was submitted in support of the original planning application (ref. A-PP 152-07-014) for minerals consent at the site:

- Chapter 20 (Blasting) contained in the original ES (Ref: FLRS ES/1 – 020503, dated May 2003).

20.1.9 To discharge conditions at the site and in support of the ongoing mitigation and monitoring at the site, the following document was prepared.

- Air Quality, Noise and Vibration Strategy (Ref: 11992/304, dated January 2007)

20.1.10 All of the above technical assessments and associated appendices have been reviewed in the undertaking of this Environmental Statement Addendum and the findings contained herein.

Purpose and Structure of Chapter

20.1.11 This chapter of the Environmental Statement Addendum (ESA) considers the impact of the proposed material amendments on the planning policy and context of the area relating to vibration.

20.1.12 The following is included with this Technical Chapter

- The methodologies utilised for the vibration assessment, including:
 - A review of the Legislation, Guidance and Planning Policy.
 - A summary of the methodologies utilised as part of the original ES.
 - Details of an updated significance criteria in conjunction with current EIA regulations.
- A review of the baseline conditions
- Detailed assessment of effects in conjunction with the review of any changes to Legislation, Guidance or Planning Policy, any potential changes in baseline conditions and the conclusions of the original ES.

20.2.0 Methodology

Changes in Legislation, Guidance and Planning Policy

- 20.2.1 Where there have been subsequent changes to legislation, policy or guidance contained within Chapter 20 of the original ES, those documents and changes are detailed below. Where legislation, policy or guidance has changed, a summary of the changes and an assessment as to whether they alter the original assessment is detailed.
- 20.2.2 With regards to the blast vibration chapter, the guidance utilised for the assessment was not listed separately, and simply referenced within the relevant paragraphs in the chapter, namely.
- Mineral Planning Guidance Note 3 (MPG3); and
 - BS 7385-2: 1993 *Evaluation and Measurement for Vibration in Buildings: Guide to Damage Levels from Groundborne Vibration*.
- 20.2.3 As stated in Chapter 20, MPG3 is no longer extant in Wales and the latest guidance appropriate to the consideration of blast vibration is outlined further below. There have been no changes to BS 7385-2: 1993 since the submission of the original ES; therefore, this is still extant and has not been considered any further.
- 20.2.4 Further to the above there were no documents relating to appropriate legislation or policy referenced in the original ES, therefore these have not been considered any further.

BS6472-2:2008

- 20.2.5 As stated in Chapter 20, MPG3 is no longer extant in Wales, and therefore for the assessment of blast vibration, British Standard 6472:2008 *Guide to evaluation of human exposure to vibration in buildings Part 2: Blast-induced vibration* needs to be referred to.
- 20.2.6 BS6472-2:2008 advises on the maximum satisfactory magnitudes of vibration for residential properties.
- 20.2.7 As blasting within the application Site (in common with the established operations in the extant mine) would only be undertaken during the daytime period, the maximum satisfactory magnitudes of vibration, with respect to human response for up to three blast vibration events per day, are between 6.0 and 10.0 peak particle velocity (PPV) mm/s.
- 20.2.8 As detailed within Section 5.0 of this addendum, Condition 23 of the Appeal Decision sets a limit of 8mm/s. Therefore, the maximum PPV levels contained within BS6472-2:2008, are in-line with the limit stated in Condition 23.
- 20.2.9 Consequently, the referencing of BS6472-2:2008 for the assessment, would not lead to significant changes in the assessment methodology or findings of the original ES.

Policy

- 20.2.10 The following policy has come into practice since the submission of the original ES.

Planning Policy Wales

20.2.11 Planning Policy Wales was updated in 2021 (Edition 11), the last paragraph of Page 115 of the document is entitled '*Reducing the Impacts of Mineral Extraction and Related Operations*'

20.2.12 Further to the above, 5.14.42 states:

"Mineral workings should not cause unacceptable adverse environmental or amenity impact. Where this is not possible working needs to be carefully controlled and monitored so that any adverse effects on local communities and the environment are mitigated to acceptable limits. Any effects on local communities and the environment must be minimised to an acceptable standard."

20.2.13 In relation to blast vibration paragraph 5.14.43 states:

"Development plans should set out clearly the criteria that will be applied to minerals proposals to ensure that they do not have an unacceptably adverse impact on the environment and the amenity of nearby residents. Issues that must be addressed include:

- *Blasting controls."*

20.2.14 With reference to the above the Site the original ES outlined recommended actions so blasting operations would not cause an unacceptable adverse environmental or amenity impact at the nearest receptors in addition an *Air Quality, Noise and Vibration Strategy*, has been produced which outlines a vibration monitoring and complaints procedure.

20.2.15 Consequently, the policies relating to blast vibration from mineral extraction operations contained in Planning Policy Wales do not alter the assessment methodology or findings of the original ES.

MTAN2

20.2.16 *Minerals Technical Advice Note 2: Coal (MTAN 2)*, came into practice in 2009.

20.2.17 The section specifically relating Blasting is contained in paragraphs 157 to 166 on pages 35-37 of the document.

20.2.18 The paragraphs describe the potential impacts from blasting operations, including ground vibration, air overpressure and fly-rock.

20.2.19 Paragraph 164 also described the planning requirements for blast vibration, the requirements contained within the paragraph mirror those contained in BS6472-2:2008 and are inline with the relevant planning condition for the Site relating to blast vibration limits.

20.2.20 Appendix L of MTAN 2 also outlines the Best Practice for blasting and states that all blasting activities should be monitored, as described in Paragraph X.5.8 blast vibration monitoring been and is currently being undertaken, at the Site on a continuous basis with approximately 90% of all blasts being monitored, the vibration data is then analysed and assessed by the Client.

20.2.21 In view of the above implementation of MTAN 2 does not alter the assessment methodology or findings of the original ES.

Merthyr Tydfil County Borough Council Local Development Plan

- 20.2.22 The Merthyr Tydfil County Borough Council Local Development Plan, came into force in 2016 and will remain in place until 2031.
- 20.2.23 Policy EnW4 relates to Environmental Protection and with regards to vibration and states:
- “Development proposals will be required to demonstrate they will not result in an unacceptable impact on people, residential amenity, property and / or the natural environment from*
- Noise, vibration, dust, odour nuisance and light pollution.*
- Where impacts are identified the Council will require applicants to demonstrate that appropriate measures have been incorporated to reduce, or minimise the impact identified to the lowest possible acceptable level.*
- Planning conditions may be imposed or legal obligation entered into, to secure any necessary mitigation and monitoring processes.”*
- 20.2.24 The original ES outlined recommended actions so blasting operations would not cause an unacceptable adverse environmental or amenity impact at the nearest receptors, in addition the levels of blast vibration permitted to be generated by the Site at the nearest sensitive receptors were stipulated within a relevant planning condition.
- 20.2.25 In view of the above the policy relating to vibration contained in the Merthyr Tydfil County Borough Council Local Development Plan does not alter the assessment methodology or findings of the original ES.

Assessment Methodology

Study Area

- 20.2.26 The study area is as defined within the original ES, and does not require amendment as a result of the proposed material amendment. On this basis, the study area as utilised within the original ES is robust and has been utilised in undertaking this ESA.

Sensitivity Criteria

- 20.2.27 Sensitivity criteria for receptors are not described within Chapter 20 of the original ES. The significance of the vibration effects, will depend on the receptor type and its sensitivity to the vibration impact. An example matrix indicating the sensitivity of the receiving environment is shown in Table 20-1.

Table 20-1 Sensitivity Criteria

Sensitivity	Definition
Very High	Residential properties (night-time), Schools and healthcare building (daytime)

Sensitivity	Definition
High	Residential properties (daytime), Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest (or similar areas of special interest)
Medium	Offices and other non-vibration producing employment areas
Low	Industrial areas

- 20.2.28 There are no named receptors within Chapter 20 of the original ES; however, it is considered that the blast vibration receptors would mirror those contained in the noise chapter (Chapter 17 of the original ES) which are all residential. Therefore, sensitivity would be defined as **'very high'** during the night-time and **'high'** during the daytime.

Magnitude of Change (Impact)

- 20.2.29 Criteria to describe magnitude of changes are not defined within Chapter 20 of the original ES, therefore a criterion has been developed in Table 20-2 below.

Table 20-2 Magnitude of Change (Impact)

Magnitude	Criteria (Exceedance in the specified vibration limits)	Definition
Major	Limit value of 8 PPV mm/s exceeded by 4 PPV mm/s or more.	Fundamental, permanent/ irreversible changes over the whole receptor, and/ or fundamental alteration to key characteristics or features of the particular receptors character or distinctiveness.
Moderate	Limit value of 8 PPV mm/s exceeded by between 2.0 and 3.9 PPV mm/s	Considerable, permanent/ irreversible changes over the majority of the receptor, and/ or discernible alteration to key characteristics or features of the particular receptors character or distinctiveness.
Minor	Limit value of 8 PPV mm/s exceeded by between 0.1 and 1.9 PPV mm/s	Discernible, temporary (throughout project duration) change over a minority of the receptor, and/ or limited but discernible alteration to key characteristics or features of the particular receptors character or distinctiveness.
Negligible	Limit value of 8 PPV mm/s not exceeded	Discernible, temporary (for part of the project duration) change, or barely discernible change for any length of time, over a small area of the receptor, and/ or slight alteration to key characteristics or features of the particular receptor's character or distinctiveness.

Significance of Effect

- 20.2.30 A significance of effect is not described within Chapter 20 of the original ES. It will depend on the collective effect of the sensitivity of the receptor, and magnitude of impact. Table 20-3 below is used as a guide to determine the level of effect; **'major'** and **'moderate'** effects are considered to be **'significant'** in terms of the EIA Regulations.

Table 20-3 Significance of Effect

Magnitude of Effect	Sensitivity of Receptor				
		High	Medium	Low	Negligible
	High	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

20.2.31 Where appropriate, the significance of effect will be classified as being;

- Direct or indirect effects.
- permanent or temporary effects; and
- beneficial or adverse effects arising from the development.

20.2.32 The consideration of effects is contained within Section 20.4 of this Chapter.

Mitigation Hierarchy

20.2.33 No Site-specific blast vibration mitigation measures are included within the original ES; however, a number of generic mitigation measures and best practice procedures to reduce the potential impacts from blast vibration are included within the text.

Effects Not Requiring Further Assessment

20.2.34 As stated in paragraph 20.1.5 no alterations are proposed to the extraction area or working practices at the mine as previously consented, therefore there will be no new or different impacts associated with blast vibration during operation will arise as a result of this S.73 application to vary Conditions 3 and 4.

20.3.0 Changes in Baseline Conditions

Original ES Baseline

- 20.3.1 The baseline vibration environment at the nearest receptors was not considered within the original ES.

Original ES Future Baseline

- 20.3.2 The future baseline vibration environment was not considered within the original ES.

Changes in Baseline

- 20.3.3 As the baseline environment was not considered within the original ES, then any changes in the baseline environment at the receptor locations cannot be assessed.
- 20.3.4 With regards to the receptor locations, it is considered that the vibration sensitive receptors (VSRs) would mirror those contained in the noise chapter (Chapter 17), namely:
- Receptor 1 – Blaen Dowlais Street to the north of the Site.
 - Receptor 2 – Japonica Drive to the north of the Site
 - Receptor 3 – Mount View to the west of the Site
 - Receptor 4 – Ffos-y-fran Cottages to the south of the Site
 - Receptor 5 – Nant y ffin Farm to the south-east of the Site.
- 20.3.5 The receptor locations described above are shown on Figure FLRS/ES19-1 in **Appendix 20-2**.
- 20.3.6 However, given that the VSRs are located away from any significant sources of vibration (i.e., railways, large commercial premises), it is considered that the baseline vibration levels would be low.
- 20.3.7 It is also considered that the current baseline vibration environment, would not have significantly changed from when the original ES was submitted in 2003.

20.4.0 Assessment of Effects

20.4.1 A formal Site-specific assessment of blast vibration was not included within the original ES, rather commentary on the risks associated with blasting (i.e., ground vibration, over pressure), and a number of generic mitigation and best practice measures to ensure the potential for adverse impacts from blasting are kept to a minimum.

20.4.2 Further to the above, within the original ES, the second part of Paragraph 20.8, of Chapter 20 states:

“Recent developments in techniques and materials have resulted in peak particle velocities of less than 6mm/sec being readily achievable. Newer planning consents tend to reflect the lower limitation of 6mm/sec for peak particle velocity for the majority of blasts. Any blasting undertaken on the Ffos-y-fran Land Reclamation Scheme would be designed to work within these criteria.”

20.4.3 The assessment of effects will therefore be based on the above with further reference to the blast vibration limits contained in Condition 23, of the Appeal Decision.

Additional Effects

20.4.4 As no alterations are proposed to the extraction area or working practices at the consented mine, there will be no change in the predicted impacts associated with blast vibration. Consequently, there are no additional vibration effects to consider.

Additional Cumulative Effects

20.4.5 There are no additional cumulative effects to consider.

Consideration of Original ES

20.4.6 The magnitude of impact definitions for blast vibration and the sensitivity of the VSR's are defined were not defined within the original ES; however, as part of this ESA these have now been defined as shown in Tables 20-1 and 20-2.

20.4.7 Based on the above, the blast vibration limit of 8mm/s PPV contained in the relevant planning condition and Tables 20-1, 20-2 and 20-3, the operations at the Site would have a:

- **Direct, Temporary, Negligible Adverse Vibration Effect** on receptors of **High Sensitivity**.

20.4.8 A negligible adverse effect is not considered significant in EIA terms.

20.5.0 Requirement for Additional Mitigation or Monitoring

Original ES Mitigation

- 20.5.1 As previously stated, a formal assessment of blast vibration was not included within the original ES, and therefore Site-specific mitigation measures were not included.
- 20.5.2 A number of generic mitigation and best practice measures to ensure the potential for adverse impacts from blasting are kept to a minimum, were included within the original ES which have been replicated below.

Groundborne Vibration

- Using all the relevant information gathered, a test blast will be designed by an independent specialist to accurately gauge the vibration characteristics of the in-situ strata. Having monitored the test blast, the independent specialist would then design a blasting schedule, suited to local circumstances, that details the most effective pattern of blast holes and correct explosive weights necessary to ensure that ground vibration is maintained within the specified limits.
- The terms of the blasting schedule would be rigorously applied by site supervisory staff. Blasting would be regularly monitored to record the actual vibration levels and these records would be retained for inspection by officers of the local authority.

Overpressure

- Air overpressure has been successfully minimised over the years, mainly through the evolution of techniques designed to confine its effects at depth within blast holes. Stemming materials and techniques used to backfill blast holes - now consists of imported angular materials designed to interlock and form a seal that largely prevents the sudden escape of high-pressure gases into the atmosphere.
 - High velocity detonating cord used in near surface blast initiation would be prohibited to prevent the sudden release of high-pressure blast gases and the development of air overpressure.
- 20.5.3 Assuming that the above mitigation and best practice measures are/has been implemented at the Site, it is considered that further measures are not required.

Subsequent Mitigation or Monitoring

- 20.5.4 Planning Condition 23 for the Site contained in the Appeal Decision (Ref: APP/U6925/A/10/2129921, dated 6th May 2011), states:
- “All blasting required for the development hereby permitted shall be designed so that the ground vibration measured as peak particle velocity (PPV) shall not exceed 8mm per second at any residential or similarly sensitive property; and the design limit shall ensure that the ground vibration for at least 95% of all blasts in any 20 week period shall not exceed a PPV of 6mm per second.”*
- 20.5.5 Condition 24 States:

“Blasting shall be limited to four blasts a day between the hours of 1000 to 1300 and 1400 to 1600 hours (two blasts per time window) and no blasting shall be carried out on Sundays or Bank/Public Holidays, nor in the hours of darkness.”

20.5.6 Condition 25 States:

“The development hereby permitted shall not be carried out other than wholly in accordance with the type of vibration monitoring station required by condition 25 of permission APP 152-07-014; all vibration monitoring stations shall be retained in the locations approved in writing by the Local Planning Authority; and all monitoring data shall be made available for inspection by the Local Planning Authority on request.”

20.5.7 Condition 26 States:

“No blasting shall be carried out within the 300m blast exclusion zone indicated on Dwg No MMAG/BLAST/01 as required by condition 26 of permission APP 152-07-014.”

20.5.8 With regards to Condition 25 blast vibration monitoring, this has been and is currently being undertaken, at the Site on a continuous basis with approximately 90% of all blasts being monitored, the vibration data is then analysed and assessed by the Client and any complaints investigated and resolved as quickly as reasonably practicable.

20.5.9 The results of the data have been analysed, it has been confirmed that **all** blasts monitored to date have been significantly below the limit of 8mm/s, with 95% of all blasts <6mm/s. Furthermore, it indicates that the vast majority of all blasts recorded are below 1mm/s.

20.5.10 However there has been a number of blast vibration complaints from local residents regarding damage to their property, which have been investigated by the Client. However, the investigations determined that the blasting operations were not the cause of the damage.

20.5.11 With regards to the other conditions relating to mitigation/site processes, it has been confirmed that these have been appropriately implemented at the Site across the life of the minerals workings.

Alternate or Additional Mitigation and Monitoring

20.5.12 Based on the results of the blast vibration monitoring being undertaken at the Site and the fact that any complaints are immediately investigated and resolved, it is considered that no additional vibration mitigation or monitoring is required.

20.6.0 Residual Effects

20.6.1 As already stated in Paragraphs 20-4-6 and 20-4-7 when considering the magnitude of impact for blast vibration and the sensitivity of the VSR's and with reference to Tables 20-1, 20-2 and 20-3, the operations at the Site would lead to the following residual impact:

- ***Direct, Temporary, Negligible Adverse Vibration Effect*** on receptors of ***High Sensitivity***.

20.6.2 A negligible adverse effect is not considered significant in EIA terms.

Consideration of Original ES

20.6.3 The residual impacts were not defined within the original ES; however, as no alterations are proposed to the extraction area or working practices at the mine as previously consented, there will be no new or different impacts associated with blast vibration during operation.

20.6.4 Consequently, the residual impacts described above remain valid.

20.7.0 Other Environmental Issues

20.7.1 This Section seeks to detail any considerations and environmental effects which have been identified with regard to the range of topics which have been introduced into EIA requirements through the EIA Regulations 2017. Where there are no such considerations or environmental effects, this is also specified below for clarity.

20.7.2 Please see Chapter 22 for a summary of the 'Other Environmental Issues' identified across all of the technical assessments undertaken and the Chapters prepared as part of the ES.

Other Environmental Issues of Relevance

Infrastructure

20.7.3 None identified

Waste

20.7.4 None identified

Population and Human Health

20.7.5 The scope of any blast vibration assessment inherently considers the population and human health, given the known impacts of vibration on human health, as assessment criteria contained within the relevant guidance documents are based on human response to noise and vibration.

20.7.6 Potential impacts on human health have therefore been assessed for the operation of the Site. As potential vibration levels upon sensitive receptors have been assessed as '**negligible**' at worst, significance of effects upon population and human health are concluded to be '**not significant**'.

Climate and Carbon Balance

20.7.7 None identified

Risks of Major Accidents and/or Disasters

20.7.8 The risks of major accidents and/or disasters is not considered of relevance to the noise Chapter.

Summary

20.7.9 With the exception of population and human health, which is concluded as being '**not significant**', no other environmental issues of relevance have been identified.

20.8.0 Summary of Effects

- 20.8.1 Chapter 20 of the original ES has been reviewed in the context of the proposed material amendment, to determine whether the proposals, and subsequent changes in policy, guidance and baseline conditions have the potential to lead to changes in the findings as described within the original ES.
- 20.8.2 In addition, blast vibration monitoring has been undertaken on a continuous basis at the Site nearest receptors to the Site in conjunction with condition 25 of the planning permission and the results of the blast monitoring have also been reviewed.
- 20.8.3 Following this review, no changes have been identified that would alter the assessment of effects as described within the original ES.

20.9.0 Conclusions

- 20.9.1 This review has identified that the proposed material amendment, and changes in policy, guidance and baseline conditions that have occurred since the original application, will not alter the findings presented within the original ES. On this basis, it is not necessary to undertake further technical assessments in support of the proposed material amendment.
- 20.9.2 It is therefore concluded that Chapter 20: *Blasting* of the original ES remains valid, and that the proposed material amendment is entirely appropriate in the context of the extant application.

REFERENCES

- Chapter 20 (Blasting) contained in the original ES (Ref: FLRS ES/1 – 020503, dated May 2003).
- Air Quality, Noise and Vibration Strategy (Ref: 11992/304, dated January 2007).
- Mineral Planning Guidance Note 3 (MPG3).
- BS 7385-2: 1993 *Evaluation and Measurement for Vibration in Buildings: Guide to Damage Levels from Groundborne Vibration*.
- British Standard 6472:2008 *Guide to evaluation of human exposure to vibration in buildings Part 2: Blast-induced vibration*.
- Planning Policy Wales 2021 (Edition 11).
- Minerals Technical Advice Note 2: Coal (MTAN 2).
- The Merthyr Tydfil County Borough Council Local Development Plan 2016-2031.
- Blast Vibration Results 2019-2022 (provided by the Client)

EUROPEAN OFFICES

United Kingdom

AYLESBURY

T: +44 (0)1844 337380

BELFAST

T: +44 (0)28 90732493

BRADFORD-ON-AVON

T: +44 (0)1225 309400

BRISTOL

T: +44 (0)117 9064280

CAMBRIDGE

T: + 44 (0)1223 813805

CARDIFF

T: +44 (0)2920 491010

CHELMSFORD

T: +44 (0)1245 392170

EDINBURGH

T: +44 (0)131 3356830

EXETER

T: + 44 (0)1392 490152

GLASGOW

T: +44 (0)141 3535037

GUILDFORD

T: +44 (0)1483 889800

LEEDS

T: +44 (0)113 2580650

LONDON

T: +44 (0)203 6915810

MAIDSTONE

T: +44 (0)1622 609242

MANCHESTER

T: +44 (0)161 8727564

NEWCASTLE UPON TYNE

T: +44 (0)191 2611966

NOTTINGHAM

T: +44 (0)115 9647280

SHEFFIELD

T: +44 (0)114 2455153

SHREWSBURY

T: +44 (0)1743 239250

STAFFORD

T: +44 (0)1785 241755

STIRLING

T: +44 (0)1786 239900

WORCESTER

T: +44 (0)1905 751310

Ireland

DUBLIN

T: + 353 (0)1 296 4667

France

GRENOBLE

T: +33 (0)4 76 70 93 41