

8 NOISE

8.1 Introduction

8.1.1 This chapter sets out the results of a study into the significance of the noise impacts associated with the clearance of the former Bersham Colliery Spoil Tip, Rhostyllen, Wrexham. Current proposals are for the extraction process to proceed in 6 separate phases with processed materials initially removed from site via road-bound vehicles to be followed, predominantly, by removal using rail freight.

8.1.2 The potential sources of noise impact arising from the proposed extraction are identified below:

- Site preparation: noise effects on existing noise sensitive receivers during the various phases of the site preparation within the study area,
- Extraction Process: noise incident on nearby noise sensitive receptors as a result of plant operations on site.
- Road Traffic: increases in traffic flows on the existing road network resulting from works vehicles.

8.2 Assessment and Methodology

Planning Considerations

8.2.1 The approach for establishing the noise limit values is based on measurement of the existing background noise levels and the subsequent setting of limiting levels relative to the measured background. The limiting noise level has been based on the guidance taken from MPG11, as shown in Table 9.1.

Table 8.1 MPG 11 Guidance

If Background Noise is:	Then Noise Limits are:
>45 dB(A)	55 dB(A)
35 to 45 dB(A)	45 to 55 dB(A) (+10dBA)
<35 dB(A)	45 dB(A)

8.2.2 Noise levels during certain works are often noisier than routine operations. Examples are soil stripping, earth bund construction, removal of spoil heaps and the construction of new permanent landforms (restoration). The MPG11 Guidelines recognise the necessity to permit these works on the basis that they are temporary and can bring long-term benefits. MPG11 suggests a noise limit for these works as being 70dB LAeq,1hr (free field) for a period of up to 8 weeks in a year.

8.3 Study Area Description

Location and Existing Sources

8.3.1 The site consists of an abandoned colliery spoil heap, the former Bersham Colliery Tip, located at National Grid Reference SJ 313 481, to the south of the village of Rhostyllen and some 2km south west of Wrexham Town Centre.

8.3.2 The site presently comprises a raised tip area that lies at a topographically higher level than the surrounding ground. Granular materials predominate in the raised area and largely comprise burnt and un-burnt colliery spoil.

8.3.3 The primary noise sources affecting site are the A5152 to the north, the A483 to the west and the railway line on the eastern boundary.

Noise Sensitive Receptors

8.3.4 Noise sensitive receptors that may potentially be subject to noise impacts as a result of the construction and eventual occupation of the scheme are listed in the table below. These have been identified on the basis of local mapping, study area drawings and location visits as well as a consideration of the extent of the proposed extraction process and location of new constructions.

8.3.5 The actual receptor positions used in the analysis of the noise effects are indicated in Table 8.2 and Figure 8.1.

Table 8.2 Noise Sensitive Receiver Locations

Noise Sensitive Receiver	Receptor Number	Occupancy	Nature of Sensitivity
Plas Grono Farm	1	Residential	Daytime
Holmwood Avenue	2	Residential	Daytime
Hafod-y-bwch Hall	3	Residential	Daytime

8.4 Baseline Conditions**Measured Noise Levels**

8.4.1 Noise surveys have been undertaken at locations within the study area. The noise survey positions have been chosen so as to determine the typical ambient and background noise levels within the study area at locations close to noise sensitive receptors.

8.4.2 The surveys undertaken involved both attended and unattended measurements, and were undertaken on the 21st October and 25th October 2006. Measurements were made predominantly in terms of the L_{A90} index although the L_{Amax} and $L_{Aeq,T}$ noise indices were also recorded for additional information. Existing typical noise levels are given in Table 8.3.

Table 8.3 Existing Typical Noise Levels at Noise Sensitive receptor locations

Position	Property	Measured Background dB L_{A90} – Weekday	Measured Background dB L_{A90} – Weekend
1	Plas Grono Farm	47.0	48.0
2	Holmwood Avenue	57.0	54.4
3	Hafod-y-bwch Hall	63.0	58.3

Dominant Noise Sources

8.4.3 The dominant noise source at each position varied with location:

- Background noise levels at Plas Grono Farm were a result of noise from the A483; however transient noises from train movements controlled ambient and maximum noise levels.
- Noise from the A5152 dominated at Holmwood Avenue
- Noise from the A483 dominated at Hafod-y-bwch Hall

MPG11 Guidelines

8.4.4 A single value for the daytime background noise level at each property has been determined by taking the lowest background noise level representing hours of operation.

8.4.5 The noise limit is described by the term dB $L_{Aeq,T}$. 'T' is a specified time period, usually taken as 1 hour.

8.4.6 In the vicinity of dwellings around the proposed extraction area, the daytime background noise level has been compared with the MPG11 Guidelines. The nominal daytime noise limits for routine materials extraction and processing work are shown in Table 8.4.

Table 8.4 Nominal Noise Limits

Location	Average Background	MPG11 Nominal Limit
Plas Grono Farm	47 - 48dB L _{A90}	55dB L _{Aeq,1hr} (free field)
Holmwood Avenue	54.4 - 57dB L _{A90}	55dB L _{Aeq,1hr} (free field)
Hafod-y-bwch Hall	58.3 - 63dB L _{A90}	55dB L _{Aeq,1hr} (free field)

8.4.7 As stated above, noise levels during certain works are often noisier than routine operations. Examples are soil stripping, earth bund construction, removal of spoil heaps and the construction of new permanent landforms (restoration). The MPG11 Guidelines recognise the necessity to permit these works on the basis that they are temporary and can bring long-term benefits. MPG11 suggests a noise limit for these works as being 70dB L_{Aeq,1hr} (free field) for a period of up to 8 weeks in a year.

8.5 Key Impacts and Likely Significant Effects

Operational Noise Impacts

Noise from Activity and from Plant and Equipment

8.5.1 At this stage of planning exact locations and plant types are not available, this assessment has been based on a 'worst case' scenario where plant is in closest proximity to the Noise Sensitive Receptors and working simultaneously.

8.5.2 There are two operations of work relevant to this application; site preparation and mineral extraction. The extraction is to be worked in six phases:

- Phase 1 - Colliery spoil will be extracted at +120m level, south of the existing substation. Excavation will commence at the south-eastern extremity of the site and continue in a northerly direction towards the existing sub station area. The excavated material will be loaded directly into a mobile screener for processing (sizing). Thereafter the material is loaded into road-going lorries by a wheeled loading shovel for haulage off site.
- Phase 2 - Colliery spoil will be extracted from the top of the colliery, reducing the peak to approximately +130m. Extraction will be completed using a single new large excavator, excavating & loading loose excavated material into dump trucks at a lower screened level. The excavated material is then hauled by dump trucks to the now low-lying southern sector for processing by the screeners/excavators. The processed material is then loaded to lorries/train trucks by loading shovels.
- Phase 3 - Colliery spoil will be extracted at +110m from the south of the colliery, working northward. Extraction, processing and disposal will be carried out as phase 2 above.
- Phase 4 - Colliery spoil will be extracted at +110m from the west of the colliery, working eastward. Extraction, processing and disposal will be carried out as phase 2 above.
- Phase 5 - Colliery spoil will be extracted at +110m from the north of the colliery, working southward. Extraction, processing and disposal will be carried out as phase 2 above.
- Phase 6 - Colliery spoil will be extracted from the remaining mineral from the north-east of the colliery, working south-westward. Extraction, processing and disposal will be carried out as phase 2 above.

Site Preparation

8.5.3 Clearance of vegetation will be achieved using a 20 tonne tracked excavator. Vegetation will then be crushed using a 'wood chipper' and the resultant material will be stockpiled on site for redistribution at a later stage. Granular fill will be site won and will be placed and compacted with a CAT D6 Dozer or similar and vibrating smooth drum roller in order to construct all necessary haul roads into the working area. Any crushing of material will be temporary and not a permanent operation.

8.5.4 Extraction of colliery spoil will be performed as described in each phase above; processed material will initially be taken off site by road vehicles. After a period of approximately 1 year materials will be predominantly transported off site via rail. It has been predicted that road activity will not exceed 120 movements per day.

8.5.5 The external source sound levels used in our assessment are taken from BS 5228 – Noise and vibration control on construction and open sites. Within this document typical working noise values of plant in various stages of site activity are given.

8.5.6 Machinery to be used within the extraction process is given in Table 8.5.

Table 8.5 Machinery Used Within the Extraction Process

Machine	Noise emission
Dozer	92dB L _{Aeq} at 10m
Lorry	82dB L _{Aeq} at 10m
Dumper	68dB L _{Aeq} at 10m
Tracked excavator/loader	74dB L _{Aeq} at 10m

8.5.7 A computer based noise prediction program has been used to assess the potential noise impact at the noise sensitive locations during a typical working day onsite during each phase of the project.

8.5.8 The increase in road traffic noise is calculated by considering the predicted additional number of vehicle movements against the existing traffic count. Noise impact from traffic is assessed from site until the A483; noise from additional north-bound traffic on the A483 has an insignificant impact on the considered Noise Sensitive Receptors. It is predicted that a maximum of 120 additional vehicle movements will be introduced by site related vehicles, 108 of which will be lorry movements. As projected movements per hour are unavailable it has been assumed that movements will be continuous and equal in number throughout the site-working-day. This equates to 12 lorry movements (6 in, 6 out) per hour.

8.5.9 The model has been used to determine noise levels at the key receptors during the working hours of the site, 0700 to 1700 hrs during the working week and 0800 to 1300 on Saturdays. Predicted noise levels are shown in Table 8.6.

Table 8.6 Predicted Noise Impact from Materials Extraction Activities

Phase	Plas Grono Farm		Holmwood Avenue		Hafod-y-bwch Hall	
	Resultant Level	Exceedance	Resultant Level	Exceedance	Resultant Level	Exceedance
Site Clearance	55.3	0*	46.9	0*	67.6	0*
1	43.7	0	35.0	0	51.9	0
2	43.7	0	45.7	0	51.9	0
3	43.7	0	45.3	0	51.9	0
4	43.7	0	48.6	0	51.9	0
5	43.7	0	48.6	0	51.9	0
6	43.7	0	48.6	0	51.9	0

* Noise levels for this period are within the temporary works allowance (see item 8.7.2)

Vehicular Noise ImpactsRoad Network Usage

8.5.10 The increase in road traffic noise is calculated by considering the predicted additional number of vehicle movements against the existing traffic count.

8.5.11 Noise impact from traffic is assessed from site until the A483; noise from additional north-bound traffic on the A483 has an insignificant impact on the considered Noise Sensitive Receptors.

8.5.12 It is predicted that a maximum of 120 additional vehicle movements will be introduced by site related vehicles, 108 of which will be lorry movements. As projected movements per hour are unavailable it has been assumed that movements will be continuous and equal in number throughout the site-working-day. This equates to 12 lorry movements (6 in, 6 out) per hour.

8.5.13 Noise impact as a result of change in traffic flow to and from site has been calculated and the results are shown below

8.5.14 Noise impact from additional vehicular movements to Plas Grono Farm is predicted to be of an insignificant level.

8.5.15 Noise impact from additional vehicular movements to Holmwood Avenue is predicted to be of an insignificant level.

8.5.16 Noise impact from additional vehicular movements to Hafod-y-bwch Hall is predicted to be of an insignificant level.

Rail Network Usage

8.5.17 Additional noise generated by loading rail trucks is controlled to an acceptable level by the proposed screening.

8.5.18 Noise impact as a result of additional heavy goods train movement has not been assessed as no data is currently available. However, the rail freight operators have indicated that noise levels arising from the use of rail freight would not exceed the levels arising from road haulage activities.

8.6 Proposed Mitigation and Residual Effects

8.6.1 Noise levels generated from the proposed mineral extraction have been predicted to the closest neighbouring properties at Plas Grono Farm, Holmwood Avenue and Hafod-y-bwch Hall. Given the proposed phase 1 reduction of ground levels then the existing noise barriers consisting of the railway cutting, the road embankment and the existing retained mound will assist in noise reduction.

8.6.2 Noise levels due to essential operations such as soil stripping, bund formation and restoration will be within the MPG11 Guidelines of 70dB $L_{Aeq, 1 \text{ hour}}$ for temporary works, to all receiver positions. These temporary works cannot be undertaken for longer than 8 weeks within a 12 month period.

8.6.3 Materials extraction and processing activities are not predicted to exceed the MPG11 nominal noise limit to each receiver position.

8.6.4 The following recommendations will be considered as good working practice and to prevent unnecessary noise:

- Maintaining equipment in good order so that squeaks and rattles are prevented and the noise levels do not rise above the values stated in this report.
- Maintaining haul routes in good condition to prevent unnecessary noise from body crash.

- If equipment is not in use, then engines must be switched off and not left to idle.

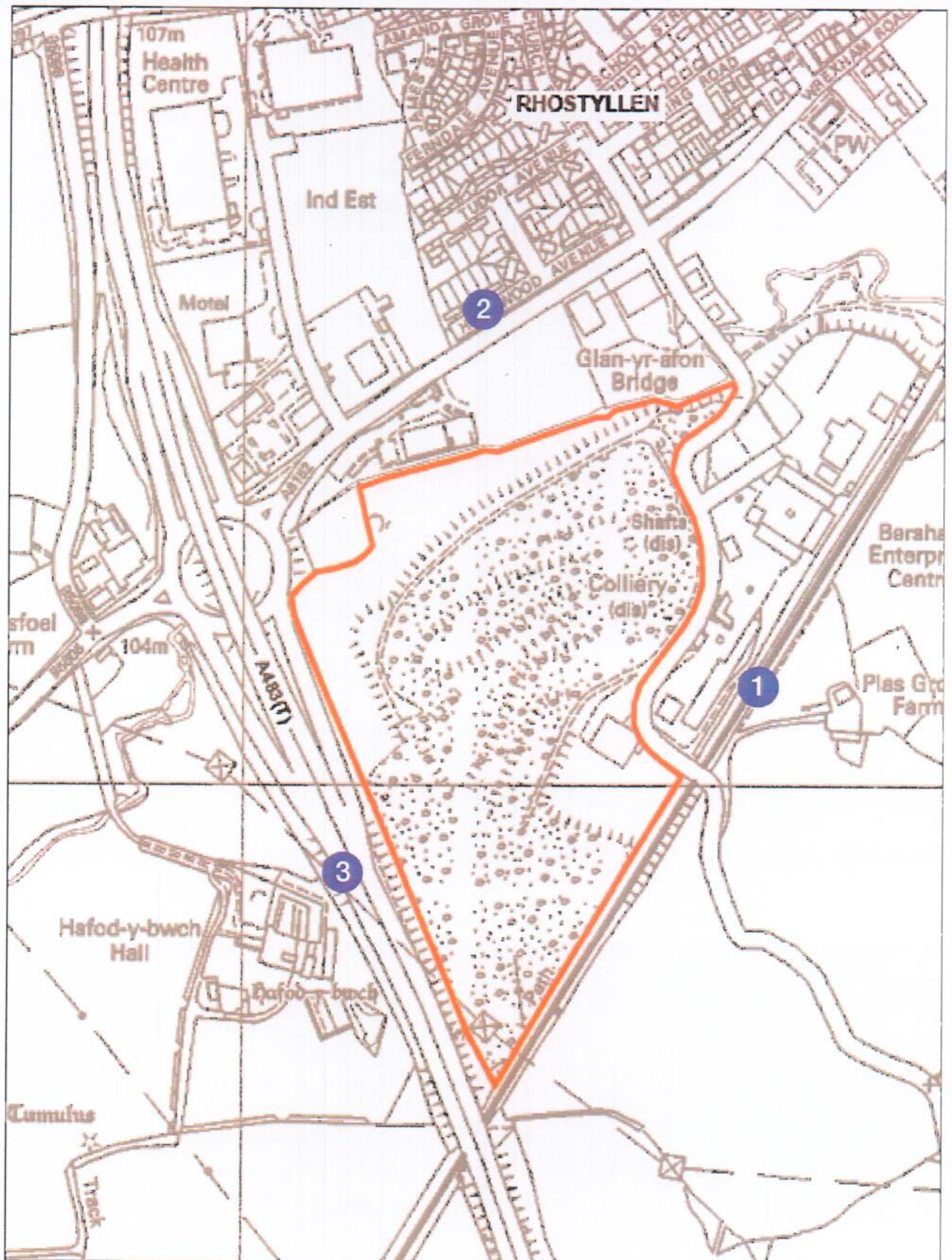
8.7 Summary

8.7.1 An assessment of the noise levels anticipated with the reclamation of the former Bersham Colliery Spoil Tip, Rhostyllan, Wrexham has been carried out. The approach for establishing the noise limit values is based on measurement of the existing background noise levels and the subsequent setting of limiting levels, based on MPG11, relative to the measured background.

8.7.2 Noise surveys have been undertaken at 3 identified noise sensitive receptors (near Plas Grono Farm, Holmwood Avenue and Hafod-y-bwch Hall) involving both attended and unattended measurements. Worst-case noise levels generated from the proposed mineral extraction have been predicted to the closest neighbouring properties at Plas Grono Farm, Holmwood Avenue and Hafod-y-bwch Hall during a typical working day in each of the 6 phases of development. The increase in road traffic noise is calculated by considering the predicted additional number of vehicle movements against the existing traffic count.

8.7.3 Noise levels due to essential operations such as soil stripping, bund formation and restoration will be within the MPG11 Guidelines of 70dB $L_{Aeq, 1 \text{ hour}}$ for temporary works, to all receiver positions. Materials extraction and processing activities are not predicted to exceed the MPG11 nominal noise limit to each receiver position. Noise impact from additional vehicular movements is predicted to be of an insignificant level to each receiver position.

8.7.4 With good working practices to prevent unnecessary noise, it can be concluded that noise emissions from the materials extraction and processing activities proposed are within acceptable levels..



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8.1
Site Location and
Monitoring Positions

FIGURE
TITLE
SCALE
DWG.NO.

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