

Technical Note

To: **Liam Toland** From: **Dr Robert Storey**
 Company: **Kedd Limited** Date: **28 January 2026**
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 Copies to: **Paul Tucker KC, Callum Baxter et al** Page: **1 of 4**
 Subject: **Noise Calculations for Bourbles Farm Quarry Development**

This email has been prepared to summarise the site noise calculations that I have completed this week for the Bourbles Farm development in preparation for the appeal against Lancashire County Council's refusal of planning permission for the site.

Basis and Method of Calculation:

The calculations have been undertaken using a spreadsheet and the methods outlined in BS5228-1: 2009 + A1:2014 "Code of practice for noise and vibration control on construction and open sites – Part 1: Noise".

The data included is based on the latest plans received for the site and the data in the previous Vibrock assessment. The intention was to replicate the calculations presented in the submitted assessment and this has been completed,

As in the submitted assessment, there are some locations where the calculated site noise level exceeds a site noise limit based on the advice in Planning Practice Guidance - Minerals (PPGM), i.e. not exceeding background noise levels plus 10 dB(A) up to a maximum of 55 dB $L_{Aeq, 1 \text{ hour}}$.

In the latest calculations, this occurs at three locations during a single phase in each. It is unclear how Vibrock also had this occur at Greenacres during Phase A unless there is some discrepancy in the location indicated on their plan.

Calculated Site Noise Levels:

The calculated site noise levels (dB $L_{Aeq, 1 \text{ hour}}$) are presented in the following table:

| Location | Phase A | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | PPGM Limits |
|------------------------------|---------|---------|---------|---------|---------|---------|-------------|
| Old Nickson's Cottage | 40 | 49 | 48 | 43 | 43 | 37 | 52 |
| Whinmore Field | 39 | 44 | 43 | 41 | 41 | 34 | 52 |
| Woodlands | 41 | 51 | 48 | 43 | 43 | 36 | 50 |
| Red Lea | 47 | 51 | 50 | 48 | 49 | 41 | 50 |
| Bourbles Farm | 47 | 50 | 50 | 50 | 53 | 40 | 50 |
| Crossing Cottage | 39 | 40 | 41 | 44 | 43 | 31 | 48 |
| Greenacres | 38 | 39 | 39 | 44 | 43 | 31 | 55 |
| Lyndale Farm | 42 | 43 | 43 | 48 | 47 | 35 | 55 |
| Mytax | 50 | 50 | 51 | 53 | 53 | 40 | 53 |
| New England Cottage | 49 | 49 | 50 | 52 | 52 | 39 | 53 |
| Hillfield House/Pointer Farm | 47 | 49 | 49 | 49 | 49 | 41 | 53 |
| The Beeches | 46 | 47 | 47 | 47 | 48 | 43 | 53 |
| Ourome | 45 | 47 | 47 | 46 | 47 | 43 | 47 |

The exceedances have been highlighted in **red and bold**.

It should be noted that there is a second property called Woodlands to the west of Ourome, to avoid confusion.

I will also point out that the on time used by Vibrock for the mobile crusher (50% so only 30 minutes in any hour) is not what I would recommend. Increasing the on time to 100% would result in a 3 dB(A) increase for that item only, which could have a minor impact on the overall calculated site noise levels.

The data input by Vibrock for the water bowser seems strange as the Sound Power Level is higher than that of the crusher and the speed of 20 mph seems far in excess of the speed for useful operation of the bowser. I would use a 104 dB Sound Power Level (down from 109 dB) and a speed of 10-15 kph (down from 32 kph). This actually results in no change to the calculated levels at the dwellings from the water bowser as the resulting increase in generated noise levels due to the lower speed is offset by the decrease in the Sound Power Level almost exactly.

Calculations were also taken to check the site noise levels due to temporary operations such as soil stripping and bund formation, but as these were in compliance with the higher short term site noise limit of 70 dB $L_{Aeq, 1 \text{ hour}}$ for those operations in both the Vibrock assessment and the latest calculations, these have not been presented in this note.

Separate calculations of the site noise levels due to the operations on the plant site and access road have also been made as this will be the main site noise during periods when campaign mineral extraction and/or infilling are not taking place.

These calculated plant site noise levels are as follows:

| Location | Plant Site and Access Road | PPGM Site Noise Limits |
|------------------------------|----------------------------|------------------------|
| Old Nickson's Cottage | 39 | 52 |
| Whinmore Field | 37 | 52 |
| Woodlands | 39 | 50 |
| Red Lea | 43 | 50 |
| Bourbles Farm | 49 | 50 |
| Crossing Cottage | 39 | 48 |
| Greenacres | 38 | 55 |
| Lyndale Farm | 42 | 55 |
| Mytax | 50 | 53 |
| New England Cottage | 49 | 53 |
| Hillfield House/Pointer Farm | 48 | 53 |
| The Beeches | 45 | 53 |
| Ourome | 42 | 47 |

It should also be noted that the presented levels are a 'worst case scenario' when all operations are taking place at once and the site noise levels presented in either table are not likely to be experienced over the course of the one hour assessment period at the dwellings considered in the assessment.

For context with regard to the exceedances of the PPGM site noise limits, they (as in the Vibrock assessment) are all below the 55 dB LAeq, 1 hour upper limit for routine mineral operations advised in the PPGM, which states in Paragraph 021:

“Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field.)”

It should also be noted that the calculated site noise levels as presented by Vibrock and above are no more than 3dB(A) above PPGM site noise limits at three locations, each during a single limited duration phase.

DeciBels are a logarithmic unit, i.e. an increase of 10dB(A) is equivalent to a doubling of the noise level and it is commonly accepted that an increase of 3dB is just reaching the border of human perception. It is unlikely an exceedance of 3dB would not noticeably exceeding the level that is considered acceptable when considered by all but a trained and experienced observer or someone of particular sensitivity to noise.

Investigation into Further Mitigation and Site Noise Levels:

In order to determine how the site could comply with the PPGM based site noise limits, extra investigation was undertaken.

There were three methods considered with regard to this investigation:

- Increase in bund heights;
- When the working distance (with the existing bund heights) would result in compliance; and
- When the working depth (with the existing bund heights) would result in compliance.

Bund Heights:

It was found that increasing the bund heights as follows would result in compliance with the PPGM based site noise limits:

Phase 1 – Woodlands – An increase of even 0.1 metres to a height of 10.1 metres AOD;

Phase 1 – Red Lead - An increase of even 0.2 metres to a height of 9.7 metres AOD; and

Phase 4 – Bourbles Farm – An increase of 1.5 metres to a height of 11 metres AOD.

Working Distance:

It was found that increasing the working distance as follows would result in compliance with the PPGM based site noise limits:

Phase 1 – Woodlands – A working distance of 50 metres;

Phase 1 – Red Lead – A working distance of 85 metres; and

Phase 4 – Bourbles Farm – A working distance of 100 metres.

Working Depth:

It was found that increasing the working depth at the nearest extraction points as follows would result in compliance with the PPGM based site noise limits:

Phase 1 – Woodlands – An increase in working distance of 0.5 metres from the top of the mineral;

Phase 1 – Red Lead – An increase in working distance of 0.5 metres from the top of the mineral; and

Phase 4 – Bourbles Farm – An increase in working distance of 2.5 metres from the top of the mineral.

Other Concerns:

There are some other concerns that arose regarding the proposed bunding on the site during the site noise calculations, which were:

- The bunding to the north of Phase 1 between the working area and the property at Woodlands needs to extend to prevent line of sight to any workings within 145 metres of the dwelling;
- It may also be useful to extend the western part of that bund to the southern boundary. This is not essential, but would provide greater protection to the properties to the west;
- The bunding to the north of Phase 4 that appears to be implemented during the works in Phase 3 would really need to be in place for the works in Phase 2 to address the cumulative noise impact at Bourbles Farm House of the plant site and the nearby workings in Phase 2; and
- The bunding between Phase 3b and Mytax/New England Cottage MUST be continuous or staggered so there is not line of sight between the properties and the workings.

It could be noted that if the owner and occupier of Bourbles Farm House has a financial stake in the development, that there is a precedent for allowing relaxation of the site noise limits at that property (especially when this would be of short duration only).

Summary and Conclusions:

Check calculations and investigations regarding potential compliance have been undertaken and minor changes to the scheme or the application of either conditional requirements regarding working distances and depth (potentially controlling the duration of the previously proposed 55 dB $L_{Aeq, 1 \text{ hour}}$ site noise limit) or the creation of the previously suggested (by both sides) Noise Management Plan should allow the site to be worked without causing ongoing noise issues at the nearest dwellings to the works.

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