Ian Sharland
LIMITED
Noise & Vibration Control Specialists

Bampfylde House
Poltimore
Exeter
Devon
EX4 0AF
Telephone: 01392 469090
Facsimile: 01392 469030
peter@iansharland.co.uk

Environment Noise Impact Assessment

Extension to Yennadon Quarry, Dousland, Yelverton, Devon, PL20 6NA

Ian Sharland Ltd Ref No.	5267/pja
Date	19th September 2011
Audit carried out by	Peter Ashford BSc MIOA
Reviewed by	John Hammond TechIOA

Client: Mr David Wallace
Yennadon Stone Ltd
Yennadon Quarry
Iron Mine Lane
Dousland
Yelverton
Devon PL20 6NA

1.0 Introduction

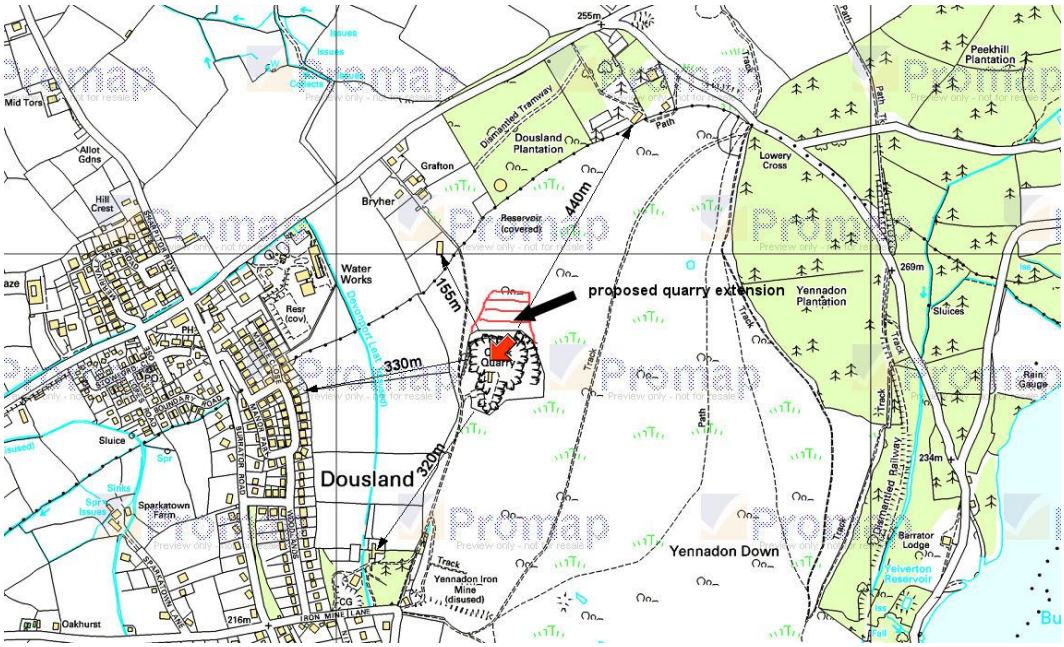
The operators of Yennadon Quarry are seeking Planning Permission to extend the quarry some 80m to the north to increase the quarry's useful life. John Grimes Partnership Ltd have prepared details of the quarries current situation and the proposed extension for consideration by the Planning Authority Dartmoor National Park Authority (DNPA), who have requested a Noise Impact Assessment for the proposed extension which will bring the north edge of the quarry to within 90m of a single dwelling to the north (Higher Yennadon).

Ian Sharland Ltd have been appointed by Mr David Wallace of Yennadon Stone Ltd to quantify the level of environmental noise across the environs as existing and by reference to Planning Policy Guidance consider the likely impact of the quarry extension and any mitigation that should be applied.

2.0 Location

The quarry lies to the east of Yelverton on the edge of the moors, Dousland is the nearest residential community some 300m to the west. The closest house (Higher Yennadon) lies some 155m to north west. This property is set at a lower level than the quarry and there is no direct line of site of the quarry.

The map below shows the site and its environs.



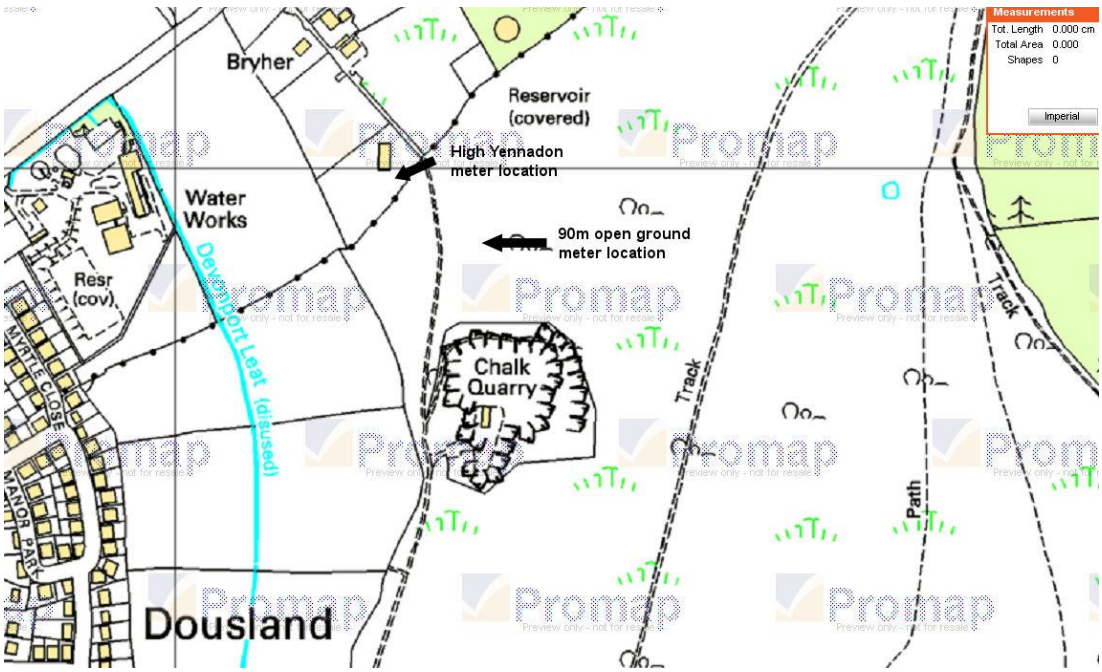
The proposed northern extension to the quarry will not be overlooked by any of the neighbours as the quarry is on higher ground and the line of sight from the houses to the quarry is interrupted by contours of the ground between.

3.0 Current Site Noise levels

I carried out a site inspection on Monday 22nd August from 1pm. During the afternoon I was on site the weather was fine with clear skies and a light intermittent wind from the south east.

When I arrived on site it was lunch time and there was very little activity taking place. The men returned to work at 2pm to the saw shop of (four of the five lines were in operation) and stone was being extracted from the north east corner of the quarry (the highest active section left of the quarry).

I set up an un-attended sound level meter, a Rion NL31 with a ½" microphone (serial No 01141942, Calibration certificate No.CAL100916) mounted on a tripod just above the southern garden wall of Higher Yennadon. The meter location is shown on the plan below along with a second one (NL31 serial No.01273081) on open ground between Higher Yennadon and the quarry, some 90m from the quarry edge.

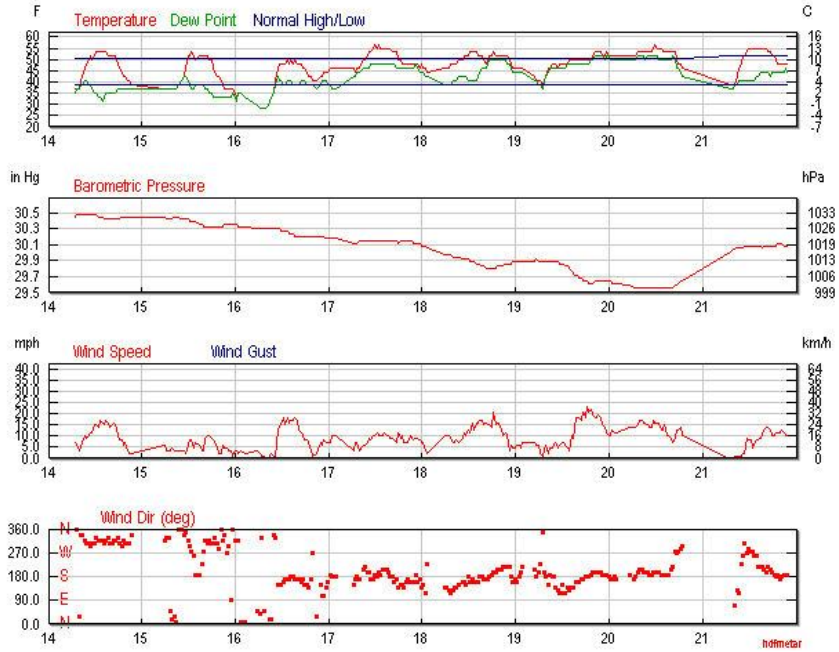


Both meters were calibrated before the survey with a Rion NC74 calibrator (serial No. 34794316 Calibration Certificate No.CONF090901) and checked again afterwards, I did not observe any significant variance.

The meters were set to record the following noise parameters every hour from 2pm on Monday 22nd through to 12am Tuesday 30th August 2011.

L_{Amax} (maximum event noise during the 5 minute period)
L_{Aeq} (the equivalent continuous energy level)
L_{A90} (the level exceeded for 90% of the time and is usually used to describe background noise)

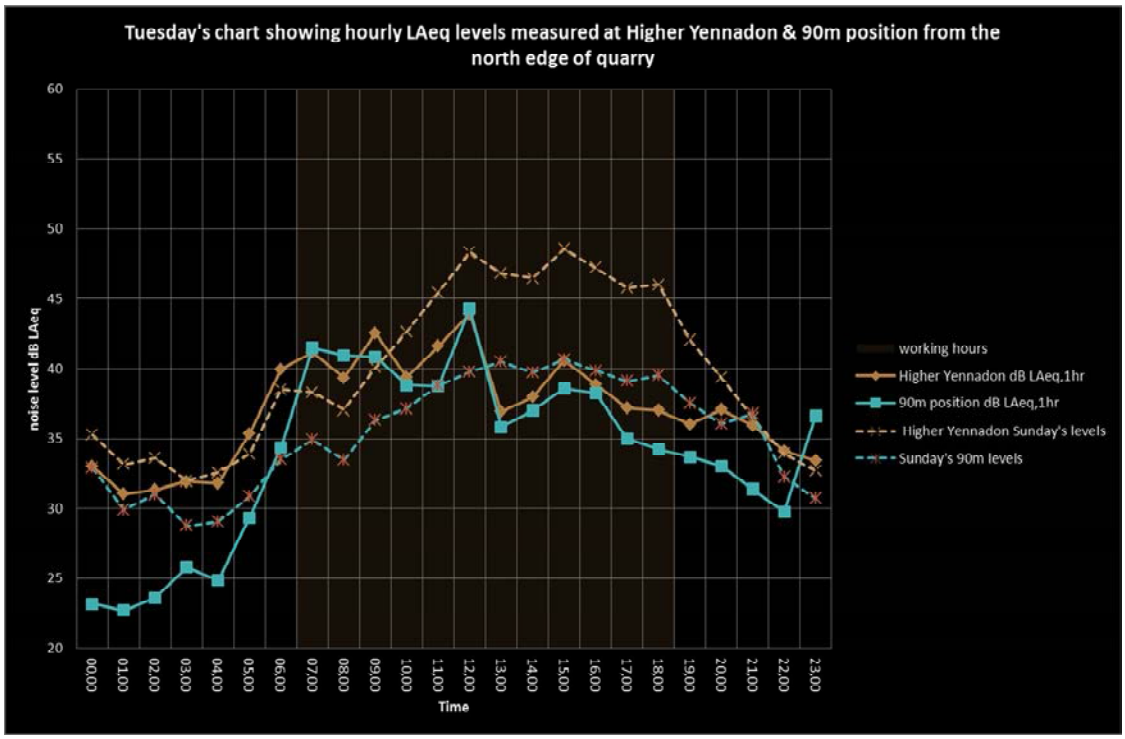
The weather during the survey period was largely fine and dry. The weather information recorded at Plymouth City Airport during this period is shown below;



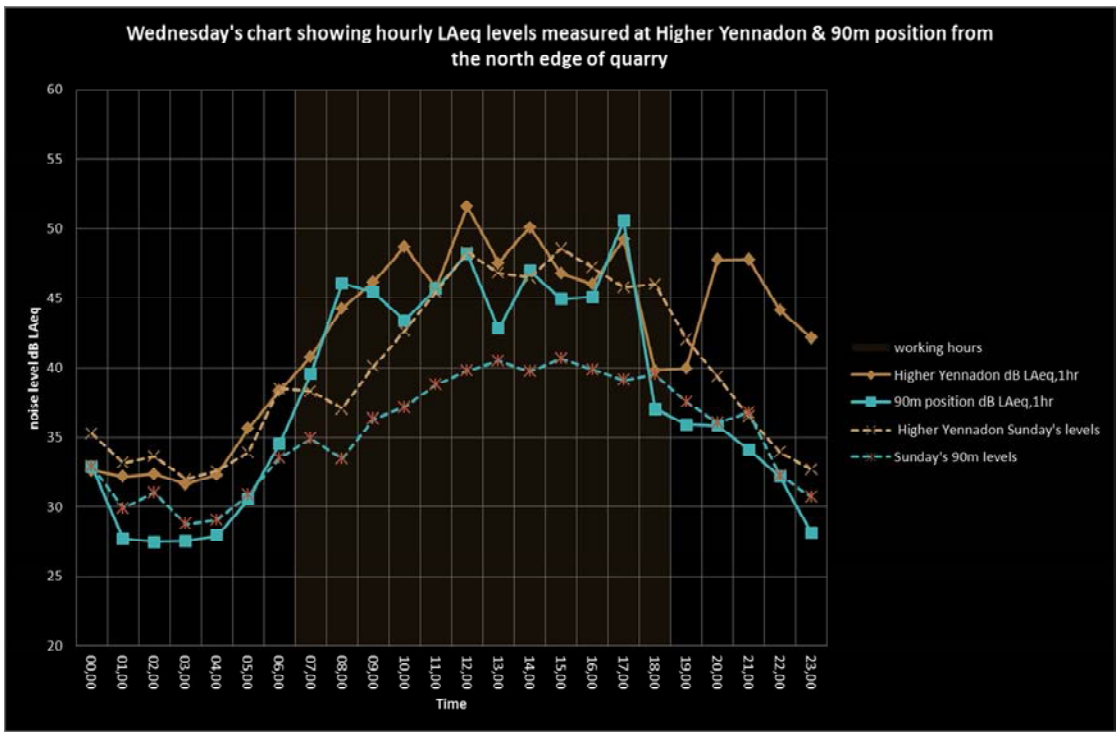
At the time of setting up the meters the contributors to the noise environment were bird song, distant traffic noise, over flying planes and intermittent quarry activity noise.

The purpose of the 90m open ground measurement position was to get a representation of what quarry noise activity levels would be at Higher Yennadon with the quarry extended.

The levels recorded are shown for each day of the survey on the Charts over page. On each the dotted lines show the noise level recorded on the Sunday 28th August when there was no activity within the quarry as this gives points of comparison with the noise levels recorded on the days when the quarry was working.

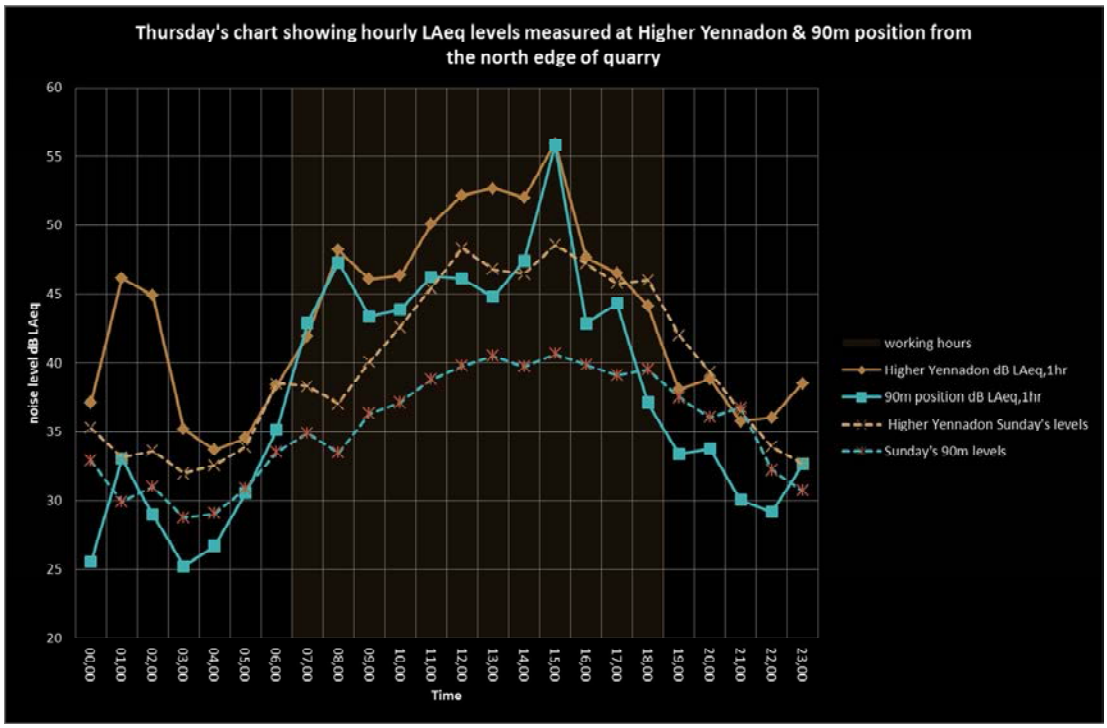


The noise levels recorded at Higher Yennadon were generally higher than the" 90m Position" from the edge of the quarry, which suggest proximity to the quarry is not the dominant factor in controlling noise levels throughout the day. However it is likely that the coincident spike which occurred at 1pm was due to the quarry.

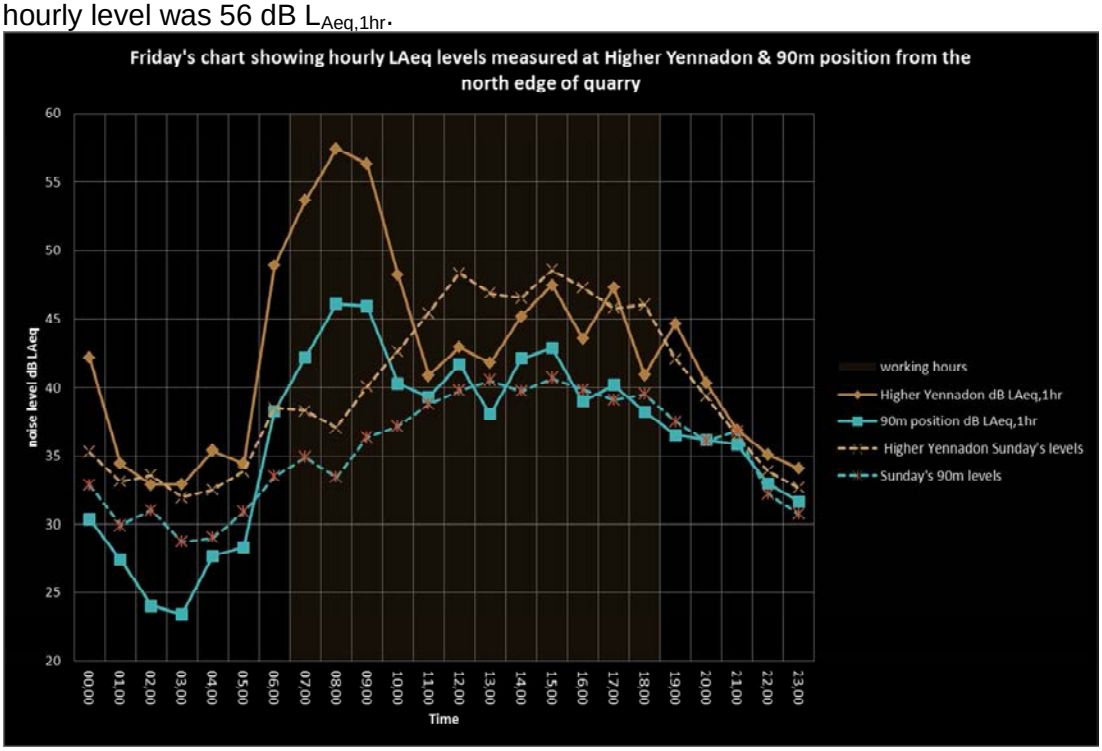


Wednesday's noise measurements again show levels generally higher at Higher Yennadon, which is further from the quarry that the 90m position and this may in part

be due to higher wind noise in the trees around the Higher Yennadon measurement position and more bird song than at the "90m Position" on the open moor.

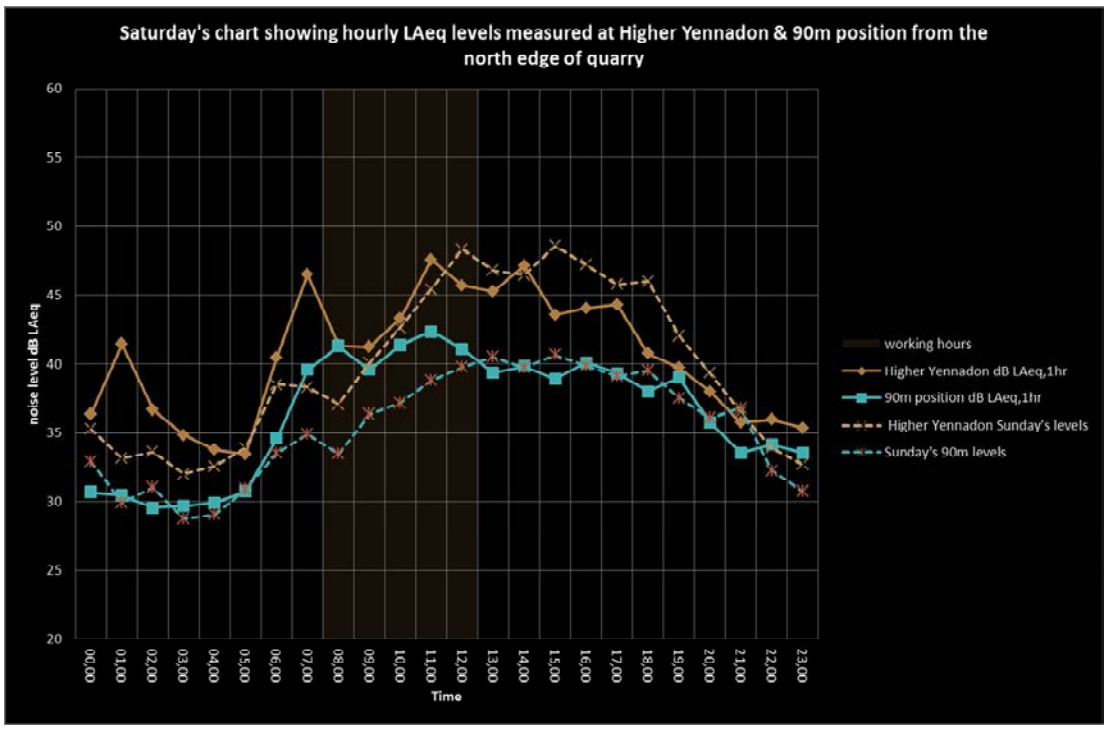


From the Thursday chart it would appear that quarry activity did control environmental noise level at both positions during working hours. The maximum hourly level was 56 dB $L_{Aeq,1hr}$.

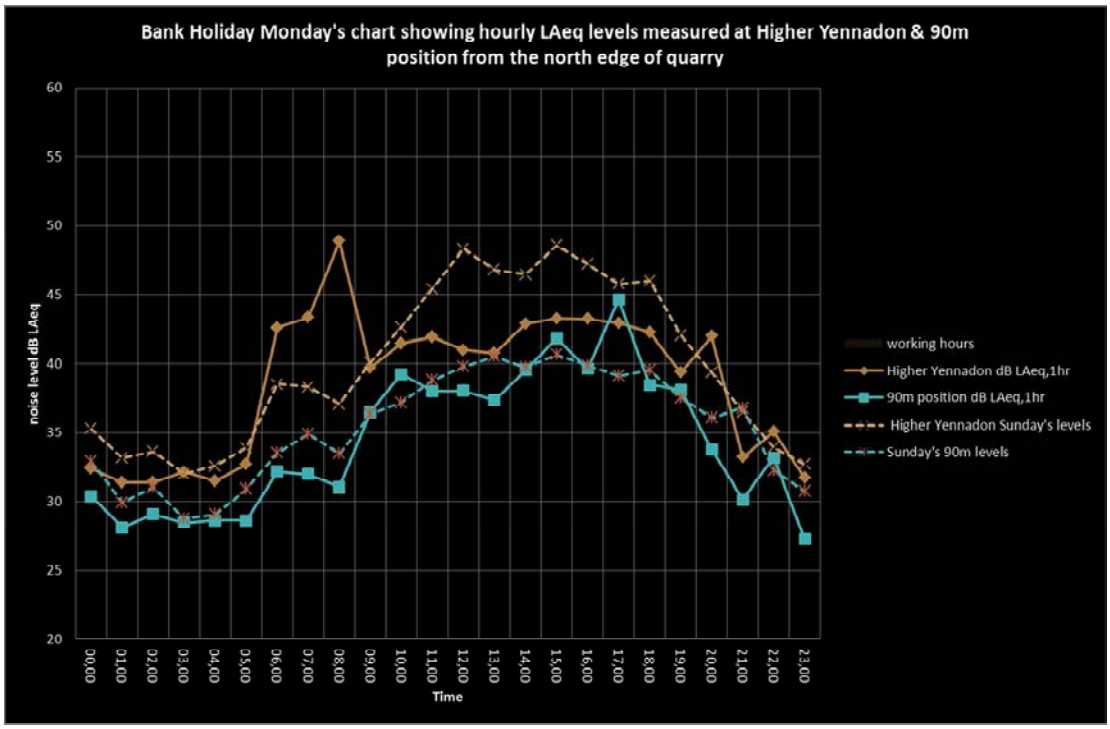


Friday's chart shows a similar shaped noise contour at both measurement locations. The explanation for the higher noise levels being recorded at Higher Yennadon,

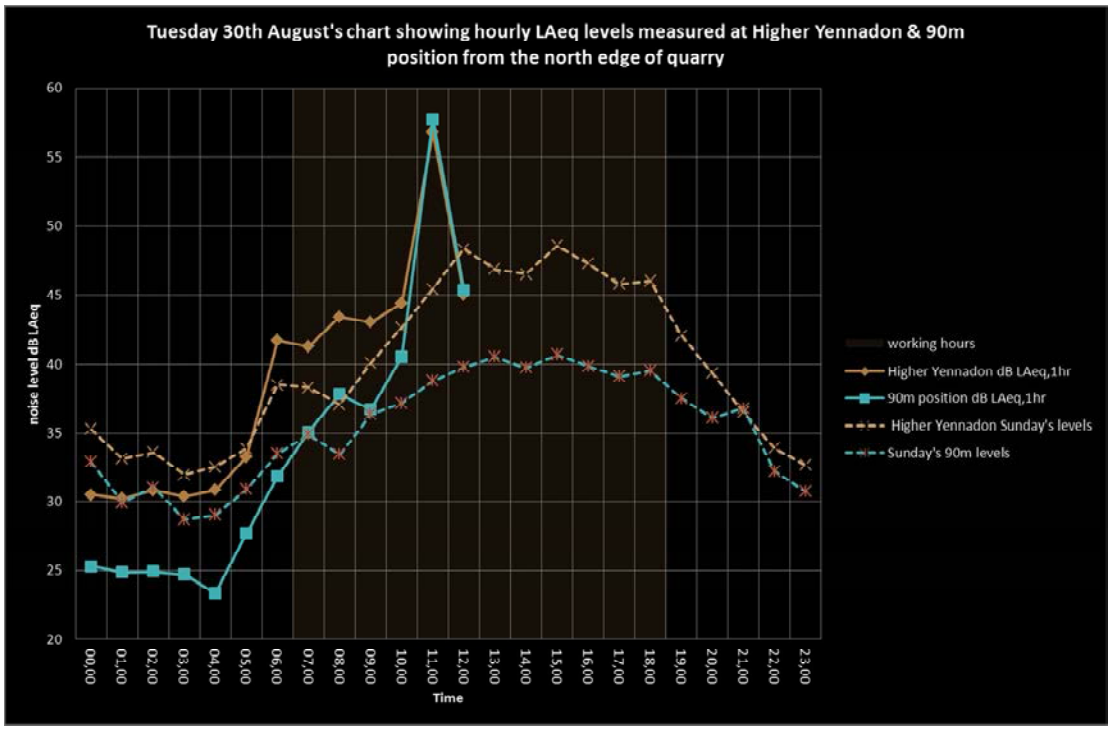
which is 65m further from the quarry, may well be due to the activity within the quarry taking place on the highest active part in the north east corner. From here there may be a less obscured line of sjght than from the “90m Position”. The highest hourly level recorded was at Higher Yennadon of 57 dB $L_{Aeq,1hr}$.



On Saturday the quarry open worked from 8am to 1pm and the chart shows that the separation in noise levels between the two measurement locations continued in a similar vane after 1pm as it did during the working when there was activity in the quarry. This is likely to be due to there being greater wind noise at High Yennadon.



On Bank Holiday Monday 27th August, when the quarry was closed, the general shape of the noise data was similar to that on Sunday, with the exception of the hours 6 & 7am at Higher Yennadon. I have no information to what the explanation for this is, however it is clear it was not caused by any activity within the quarry.



I understand from the men at the quarry that the peak recorded at 11am was due to low flying aircraft.

Whilst on site setting up and collecting the meters quarry activity noise was observed and I noted the following points,

1). I was not aware of the saw shop at either of the measurement locations,
2). The north east corner of the quarry was being worked during the week of my survey. Here the stone being extracted is fairly close to the ground level and although not visible from the north, work here would be the least screened by the quarry edge.
3). The plant used to extract the stone was;

i). 360° slew with riddler bucket recorded creating 84 dB L_{AEq} at 10m whilst riddling stone,

ii). Daewoo 360° slew with plan bucket for moving sorted stone into dumper, recorded creating 80 dB L_{Aeq} at 10m, as the stone is dropped in to the dumper a noise level of 84 dB L_{Aeq} was noted at 10m,

The photograph below shows the slew placing stone in the dumper truck;

iii). An Akerman 3060^{o} slew with plain bucket which was recorded at 84 dB $L_{Aeq\ at\ 10m,}$

iv). An ONK slew with “ripper” which was recorded at 85 dB L_{Aeq} at 10m;

4). The “pecker” attachment used to break stone away from the quarry face was not on site during my survey period as it was away being serviced.

5). Once the "pecker" or "ripper" frees stone from the working face the stone is then picked and worked using sledge hammers and axes before being loaded by hand in to one of the buckets of the slews. Outside of the quarry the most distinctive quarry noise is the rattle created as the slew drops its bucket of stone into the dumper truck. With four men working on the quarry face up to 6 dumper loads of stone can be brought back to be sorted, again by hand, outside the "saw shed".

6). The slew tend to only run for a few minutes at a time as the stone is being picked and loaded, but when ripping and pecking is being carried out this can go on for a couple of hours in a day.

4.0 Compliance with Planning Guidance

In 2005 what was the Office of the Deputy Prime Minster published guidance on noise and mineral extract in Annex 2 of Mineral Policy Statement (MPS2), which states;

PLANNING CONDITIONS

2.18 Where appropriate, planning conditions should be used to ensure that mineral operations are carried out in such a way that noise emissions are minimised at the source and thereby controlled to acceptable levels. The layout and plant location, the sequencing of operations and the hours of working can have significant effect on the level of noise emissions and their impact on sensitive receptors. Enclosure of a noisy plant and the use of acoustic screening and baffle mounds can reduce noise emissions as well as having other benefits.

It may be appropriate to incorporate a buffer zone around the operations. This is of particular significance in controlling the encroachment of other development towards an existing mineral working. Where certain species may be significantly affected by noise (e.g. breeding birds), it may be appropriate to restrict certain mineral activities at sensitive times. Guidance on noise reduction is given in Appendix 2B.

2.19 Planning conditions should be used to apply absolute controls on noise emissions with limits normally being set at particular noise-sensitive properties (the terms used are defined in Appendix 2A). This enables the effect of noise to be related most directly to its impact on local people. In some circumstances, however, it might be more appropriate to set the limits at the site boundary or some other point. Subject to a maximum of 55dB(A) $L_{Aeq,1h(free\ field)}$, MPAs should aim to establish a noise limit at the noise-sensitive property that does not exceed the background level by more than 10dB(A). It is recognised, however, that this will in many circumstances, be difficult to achieve without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near that level as practicable during normal working hours (0700-1900) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). Evening (1900-2200) limits should not exceed background level by more than 10dB(A) and night-time limits should not exceed 42dB(A) $L_{Aeq,1h}$ (free field) at noise-sensitive dwellings. Where tonal

noise contributes significantly to the total site noise, it may be appropriate to set specific limits for this element. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise — e.g. L_{max} in specific octave or third-octave bands — and should not be allowed to occur regularly at night.

2.20 All mineral operations will have some particularly noisy short-term activities that cannot meet the limits set for normal operations. Examples include soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance. However, these activities can bring longer-term environmental benefits. Increased temporary daytime noise limits of up to 70dB(A) $L_{Aeq1h\ (free\ field)}$ for periods of up to 8 weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs. Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered.

In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits.

Within this framework, the 70 dB(A) $L_{Aeq1h\ (free\ field)}$ limit referred to above should be regarded as the normal maximum. L_{As} should look to operators to make every effort to deliver temporary works at a lower level of noise impact. Operators should seek ways of minimising noisier activities and the noise emissions from them when designing the layout and sequencing of temporary operations, and should liaise with local residents prior to such operations taking place.

2.21 Conditions on planning permissions should identify the noise-sensitive properties at which the noise limits are set, including the relative sensitivity to noise, which may result in different limits for different types of property, and establish a scheme of monitoring that identifies how, where and when noise is to be measured, who should be responsible and how the results will be assessed and used. Alternatively, a condition should be attached requiring a scheme of compliance noise monitoring to be submitted to and approved by the MPA. Where necessary, the MPA should seek to use Agreements under Section 106 of the Town and Country Planning Act 1990, as amended, to ensure access to noise-sensitive sites for monitoring purposes. Conditions should also be used to secure effective procedures for dealing with complaints. Planning obligations can help to ensure continued effective liaison with the local community and others affected by noise emissions.

The week long noise survey has demonstrated that the noise levels at the nearest residential dwelling (Higher Yennadon), some 155m from the current northern edge of the quarry fell between 36 & 57 dB L_{Aeq} during week day working hours. Day time levels recorded over the Bank Holiday week end (when the quarry was shut) fell into a very similar range of 40-57 dB L_{Aeq}.

Measurements at the "90m position" much closer to the quarry than the house was rarely higher than at Higher Yennadon and across the working week this only occurred in five separate hours. The highest hourly level at the "90m position" was 51 dB L_{Aeq} recorded at 5pm on Wednesday 24th August when the quarry reported a slew was working on top of the spoil mound on the north west edge of the quarry, where the slew would be in a direct line of sight of both the measurement locations.

Typically day time noise levels at "90m Position" were somewhere between 45 & 50 dB L_{Aeq} and this I believe would be indicative of the likely noise level at Higher Yennadon if the quarry was to be extended 90m to the north.

MPS 2 Annex 2 suggests at upper limit of 55 dB L_{Aeq} from quarry activity at the closest neighbours for week day working.

Given that the working hours of the quarry are already limited by Planning Condition to week days 7am to 6pm, 8am to 1pm Saturdays and no working on Sundays or Bank Holidays then it can be seen that the MPS 2 55 dB L_{Aeq} criterion can be complied without mitigation.

5.0 Mitigation

The noise survey results over the weekend, when the quarry was shut does show that ambient noise levels can fall less than 40 dB L_{Aeq} and therefore a limit of 55 dB L_{Aeq} on noise from the quarry extension could be more than 10 dB greater than ambient levels.

To help protect the amenity of the neighbour to the north it would therefore be sensible to construct a bund, at least 4m high, so as to visually screen all quarry workings, right from the surface down. This bund would increase screening losses by at least 5 dB and therefore it would not be unduly constrictive to consider the imposition of a noise condition of 50 dB $L_{Aeq(free\ field)}$ at the nearest neighbouring property.

Appendix 1 at the report of this report sets out some very useful examples of Good Practice in Noise Reduction for surface mineral operations, this should be read and implemented where appropriate.

6.0 Summary

A detailed noise survey has been carried out of existing quarry activity noise at the nearest neighbour Higher Yennadon some 155m from the northern edge of the existing quarry. Noise levels were also monitored 90m from the edge of the quarry, which would effectively be the distance from the extended quarry to Higher Yennadon.

The survey has shown that noise levels are typically higher at Higher Yennadon than they are at the closer "90m position" and this suggests that quarry activity noise does not control the noise climate at the neighbours.

Typically noise levels at the "90m position" fell in the range of 45-50 dB L_{Aeq} during the working day. The highest hourly level was 51 dB $L_{Aeq,1hr}$ which was recorded

whilst a 360° slew worked on top of the spoil mound, to the north west of the quarry, in direct sight of the measurement positions.

Government Guidance offered in MPS 2 Annex 2 suggest that mineral extract noise should be limited to no more than 55 dB L_{Aeq} when measured at the nearest neighbour, however it does also point out that if this is more than 10 dB higher than ambient levels a lower limit might be more appropriate.

The report therefore proposes that with the aid of a substantial bund constructed on the northern edge of the proposed quarry extension noise from the extended quarry could be controlled to no more than 50 dB L_{Aeq}.

Written by;

Peter Ashford BSc MIOA
Ian Sharland Ltd

Appendix 1: Examples of Good Practice in Noise Reduction

INTRODUCTION

2B.1 Surface mineral operations can be, by their nature, noisy, in common with many activities of an industrial character. It is not practicable to stop all noise emissions but a variety of practices can assist in reducing emissions from a mineral operation and reducing its impact on the surrounding area and properties.

SITE LOCATION AND LAYOUT

2B.2 While the location of mineral extraction is clearly dictated by the location of the mineral resource, it may be possible to avoid some impacts on noise-sensitive properties without undue effect on the amount of mineral available for extraction. Incorporation of buffer
zones into the design of the site and its environs can help to mitigate noise emissions and is particularly useful in resisting the encroachment of new development towards mineral operations. This may assist in keeping available for exploitation, mineral resources of value to the economy and society that would otherwise be sterilised. Not all noise-sensitive properties and land uses are equally sensitive and this should be taken into account in establishing stand-off zones and noise limits.

2B.3 Noise emissions should be fully considered in the design of mineral operations. The site should be laid out in such a way as to minimise the noise impact. Fixed plant and facilities, including maintenance areas, should be located accordingly, taking advantage of any shielding available from the natural topography. It may also be possible to use the quarry face or existing tips, or overburden or soil mounds to shield fixed plant and facilities. Plant that generates noise emissions, including pumps operated at night, should be located as far as possible from noise-sensitive properties. In some cases, it may be appropriate to use mobile plant on the quarry floor rather than a fixed plant at normal ground level. Site buildings may also be grouped to form a barrier between site operations and noise-sensitive properties. Haul roads should not be routed along exposed locations and should have as low a gradient as possible and as smooth a surface as is feasible.

CHOICE OF EQUIPMENT

2B.4 Where a choice of methods or plant is available, the quieter should be chosen. For example, it is possible to reduce emissions by 5–10dB(A) using a quieter, earth-moving plant. Mineral operators should ensure they know the level of noise emissions (in comparable working conditions to those expected on site) from a plant under consideration, and manufacturers should include sound level output in the specification of their equipment. Operators should consider the use of an electrically-powered plant with its power source in an acoustic enclosure.

2B.5 Vehicle-reversing alarms, because of their tone, are one of the principal causes of complaints about noise from mineral operations. The need for safety in operation is clearly

paramount but consideration should be given to the use of adjustable or directional audible alarms or other alternative warning systems – e.g. white noise alarms give a full spectrum of noise rather than a single tone, which is claimed to be as good as single tone alarms at close range and at a distance, it blends into the background noise. Operators should discuss with the Health & Safety Executive and the MPA whether less intrusive systems can be safely used. Where such alternatives are not feasible then it may be possible to arrange site layout and working practices so that vehicles reverse away from noise-sensitive properties.

MAINTENANCE OF PLANT

2B.6 Regular and effective maintenance of plant can play an important role in keeping noise within reasonable standards as well as contributing to greater efficiency in operation. Particular attention should be paid to the lubrication of bearings, the sharpness of cutting edges and the integrity of silencers and any acoustic enclosures around plant.

SITE OPERATIONS

2B.7 Some operations are inherently noisy but consideration in use can help to reduce the impact of such operations. Examples of how noise reductions can be achieved include:

- minimising the height from which material drops from lorries or other plant, emptying dragline buckets as near as possible to the final placement area of spoil and minimising the clanging of dragline chains and buckets by careful operation;
- use of rubber linings in chutes, dumpers, transfer points etc. to reduce the noise of rock falling on metal surfaces;
- using simple baffles around washing drums, rubber mats around screening, crushing and coating plants;
- enclosing pumps, covering conveyors, cladding the plant (ensuring that cladding is kept free of holes) and keeping noise control hoods closed when machines are in use;
- within the constraints of efficient production, limiting the use of particularly noisy plant, limiting the number of items in use at any one time, starting plants one-by-one and switching off when not in use;
- avoiding unnecessary revving of engines, reducing speed of vehicle movement, particularly to avoid body slap from empty lorries, keeping lorry tailgates closed where possible, designing and maintaining haul roads to minimise vehicle noise; and
- pointing directional noise away from sensitive areas where possible.

SEQUENCING OF ACTIVITIES

2B.8 Where possible, workings should be arranged so that earlier operations provide screening for noise-sensitive properties from noise generated by subsequent activities. This could influence both the direction of working of the quarry, subject to any other constraints on it, and the placement of overburden and soil mounds on the site perimeter. For example, working away from noise-sensitive properties means the noise received will reduce with time. If excavation proceeds towards noise-sensitive properties, the quarry face can itself

provide protection by acting as a screen to those properties. Mineral operators should liaise with the local community to enable noisy operations near to noise-sensitive properties to take place at times when they would have the least impact on the occupiers.

ACOUSTIC SCREENING

2B.9 Acoustic screening can be effective both near the source of noise and near the noise sensitive property. Reductions of 5–10dB(A) can generally be obtained depending on whether the noise is partly or completely screened from the measurement point.

2B.10 Maximum opportunity should be taken in laying out and sequencing operations to enable screening of noisy activities. As far as reasonably possible, sources of significant noise should be enclosed. BS5228 provides advice on various types of acoustic enclosures. Acoustic fencing between the operation and noise-sensitive properties can provide protection against noise, particularly where space is limited. It can be used on its own or in combination with other methods of screening. A simple wall of straw bales can significantly reduce noise emissions.

2B.11 Baffle mounds around the perimeter of the site or at other appropriate locations can make a significant reduction in the exposure of local people to noise from mineral operations. Such mounds are frequently constructed of soil or overburden that has to be removed and stored to enable access to the mineral.

2B.12 The process of baffle mound construction, though short-lived, is itself one of the noisiest aspects of mineral working. It will generally be appropriate for higher noise levels to be allowed for a limited period to allow construction to take place. While this will lead to temporary inconvenience, the longer-term benefits will be substantial. MPAs and mineral operators should liaise with the local community to explain this.

2B.13 Acoustic screening can also be used at the point of impact. It may, exceptionally, be appropriate to reduce the impact of noisy operations by installing acoustic secondary glazing or acoustic fencing at noise-sensitive properties. Requests to do so should be considered in the light of advice on the use of planning obligations in DETR Circular 01/97 *Planning Obligations*. Action at the property should not be seen as an alternative to reducing noise at source, or a means of legitimising higher noise limits. It should be seen as an additional safeguard to the quality of life for local residents to be used in exceptional circumstances and only with the agreement of owners/occupiers of noise-sensitive properties.

Addendum
Environment Noise Impact Assessment
Extension to Yennadon Quarry
Dousland
Yelverton
Devon, PL20 6NA

Client:
Mr David Wallace
Yennadon Stone Ltd
Yennadon Quarry
Iron Mine Lane
Dousland
Yelverton
Devon PL20 6NA

Prepared by
Peter Ashford
Acoustic Associates South West Ltd
Exeter
UK

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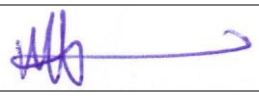
signature	
Reviewed	John Hammond
signature	
Date	24th March 2014

CONTENTS

1.0 Introduction

1.1 A planning application for the extension of Yennadon Quarry was submitted to the local authority at the end of December 2013 along with a Noise Assessment prepared by myself Peter Ashford (2011) whilst working for Ian Sharland Ltd, since which time I have set up Acoustic Associates South West Ltd and am now its managing director. Ms Andrea Robertson of John Grimes Partnership has asked that I provide additional information requested by Local Authority relating to the planning application, namely;

- Whether there is a direct line of sight from Higher Yennadon to the quarry,
- NPPF now needs to be taken into consideration,
- A substantial bund is proposed, partially in order to attenuate the noise resulting from the development. Additional information should be provided to show the length of time the creation of the bund would take and the likely noise levels resulting from this. Tipping at surface level is often given as an example of an aspect of development which is particularly noisy and is associated with higher noise levels. The assessment to comprise a cumulative assessment as the normal quarry operations would presumably continue at this time.
- The noise assessment does not appear to make an assessment of the differing pitch of noise levels or recommendations relating to this. It would usually be expected some projection and analysis of the effect of reversing beepers.

1.2 One of Yennadon Quarry competitors Lantoom Ltd, who operate from Lantoom Quarry Liskeard have provided a review of my acoustic assessment carried out by SLR Consulting Limited, who have queried the proposed noise limits and noted that no information has been provided about likely level of noise which will be created during the early phases of working on the quarry extension.

1.3 This addendum report provides further detail and clarification of these points.

2.0 Sight Lines from Higher Yennadon

2.1 The photographs below has been taken from the northern edge of the existing quarry looking towards Higher Yennadon which can be made out behind a stone wall and trees in the centre of the photograph;

2.2 Currently the quarry activity is sufficiently deep into the ground that it is completely screened from view of Higher Yennadon. The creation of the perimeter bund and some of the surface working of the quarry extension will be just visible from Higher Yennadon.

2.3 The photograph over page shows the view from Higher Yennadon looking south to the quarry, where the existing quarry bund can be seen behind the trees (centre right) the quarry extension will see this bund extended to the right and increased in height so that the surface of the quarry floor behind it will be obscured.

3.0 National Planning Policy Framework

3.1 The Department for Communities and Local Government published in March 2012 Technical Guidance to the National Planning Policy Framework. The Noise Standards set out in Paragraphs 30 and 31 have been taken from the document published in 2005, by what was the Office of the Deputy Prime Minster, Annex 2 of Mineral Policy Statement (MPS2), which stated;

> ***PLANNING CONDITIONS***
>
> *2.18 Where appropriate, planning conditions should be used to ensure that mineral operations are carried out in such a way that noise emissions are minimised at the source and thereby controlled to acceptable levels. The layout and plant location, the sequencing of operations and the hours of working can have significant effect on the level of noise emissions and their impact on sensitive receptors. Enclosure of a noisy plant and the use of acoustic screening and baffle mounds can reduce noise emissions as well as having other benefits.*
>
> *It may be appropriate to incorporate a buffer zone around the operations. This is of particular significance in controlling the encroachment of other development towards an existing mineral working. Where certain species may be significantly affected by noise (e.g. breeding birds), it may be appropriate to restrict certain mineral activities at sensitive times. Guidance on noise reduction is given in Appendix 2B.*

2.19 Planning conditions should be used to apply absolute controls on noise emissions with limits normally being set at particular noise-sensitive properties (the terms used are defined in Appendix 2A). This enables the effect of noise to be related most directly to its impact on local people. In some circumstances, however, it might be more appropriate to set the limits at the site boundary or some other point. ***Subject to a maximum of 55dB(A) $L_{Aeq,1h(free\ field)}$, MPAs should aim to establish a noise limit at the noise-sensitive property that does not exceed the background level by more than 10dB(A). It is recognised, however, that this will in many circumstances, be difficult to achieve without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near that level as practicable during normal working hours (0700-1900) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). Evening (1900-2200) limits should not exceed background level by more than 10dB(A) and night-time limits should not exceed 42dB(A) $L_{Aeq,1h}$ (free field) at noise-sensitive dwellings. Where tonal noise contributes significantly to the total site noise, it may be appropriate to set specific limits for this element. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise — e.g. L_{max} in specific octave or third-octave bands — and should not be allowed to occur regularly at night.***

2.20 All mineral operations will have some particularly noisy short-term activities that cannot meet the limits set for normal operations. Examples include soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance. However, these activities can bring longer-term environmental benefits. Increased temporary daytime noise limits of up to 70dB(A) $L_{Aeq1h\ (free\ field)}$ for periods of up to 8 weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs. Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) $L_{Aeq1h\ (free\ field)}$ limit referred to above should be regarded as the normal maximum.

3.2 The paragraphs highlighted **in bold type** now appear in the NPPF document para' No. 30 & 31

LA's should look to operators to make every effort to deliver temporary works at a lower level of noise impact. Operators should seek ways of minimising noisier activities and the noise emissions from them when designing the layout and sequencing of temporary operations, and should liaise with local residents prior to such operations taking place.

2.21 Conditions on planning permissions should identify the noise-sensitive properties at which the noise limits are set, including the relative sensitivity to noise, which may result in different limits for different types of property, and establish a scheme of monitoring that identifies how, where and when noise is to be measured,

who should be responsible and how the results will be assessed and used. Alternatively, a condition should be attached requiring a scheme of compliance noise monitoring to be submitted to and approved by the MPA. Where necessary, the MPA should seek to use Agreements under Section 106 of the Town and Country Planning Act 1990, as amended, to ensure access to noise-sensitive sites for monitoring purposes. Conditions should also be used to secure effective procedures for dealing with complaints. Planning obligations can help to ensure continued effective liaison with the local community and others affected by noise emissions.

3.3 In summary NPPF states, as did the old MPS2, that noise from mineral extract should be limited with reference to three criterions, namely;

1). to prevent serious annoyance levels should be less than 55 dB L_{Aeq},
2). to prevent moderate annoyance levels should be less than 50 dB L_{Aeq},
3). Mineral extract noise should not exceed the background noise level by more than 10 dBA, however it is recognised that this may impose an unreasonable burden on the operator, therefore the limit should be set as near that level as practicable but not to exceed 55 dB $L_{Aeq\ 7am\ to\ 7pm}$.

4.0 Quarry phase working and noise levels

4.0.1 The proposed quarry extension and the new bunding around it is shown on John Grimes Partnership Ltd drawing No. 7395-RP-01, a copy of which is attached at the rear of this report. The closest area (to the nearest receptor) of stone extract will be Zone I in the north west corner of the site.

4.1 Temporary works

4.1.0 The operators of Yennadon Quarry have confirmed the following time estimates for the creation of the bunding along the west and northern edges of the quarry extension;

i). fencing approx. 1 week
ii). stripping topsoil approx. 2 weeks
iii). create bund approx. 3 weeks
iv). re-soil, shape and seed approx. 2 weeks
v). remove fencing (once vegetation has been established) less than 1 week

4.1.2 Paragraph 31 of NPPF which states for "*Increased temporary daytime noise limits of up to 70dB(A)* $L_{Aeq1h\ (free\ field)}$ *for periods of up to 8 weeks in a year"* can be assumed. Here the temporary works are estimated to be completed within 7 weeks.

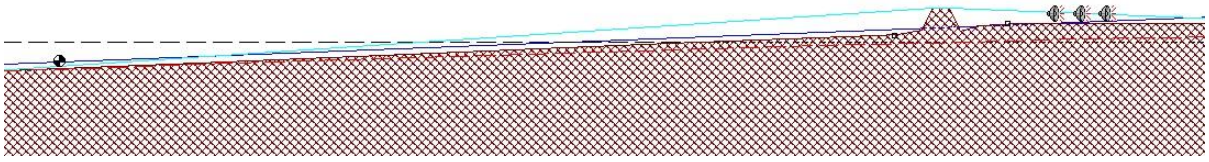
4.1.3 The noise level calculated using ISO 9613 – Part 2 at Higher Yennadon with a 360° slew and a dumper carrying out the temporary works, whilst normal quarry activity is being carried out is 59 dB $L_{Aeq,T}$ (see calculation in Appendix 1) and this has been based on all items of plant running continuously. This is the "worst" case assumption as the plant used for quarrying are run intermittently and the staff operating the plant carryout the temporary works will be staff taken from the quarry.

4.1.4 This predicted noise level is well within the NPPF suggested limit for temporary works of 70 dB $L_{Aeq,T}$.

4.2 Quarry works at 5m below surface level Zone I

4.2.1 The predicted noise level at Higher Yennadon with mineral extract being carried out 5m below surface in the north west corner of the quarry extension (Zone I), the closest point to Higher Yennadon is 49 dB $L_{Aeq,T}$ (see Appendix 2). It should again be recognised that this is the worst case when all plant is running continuously.

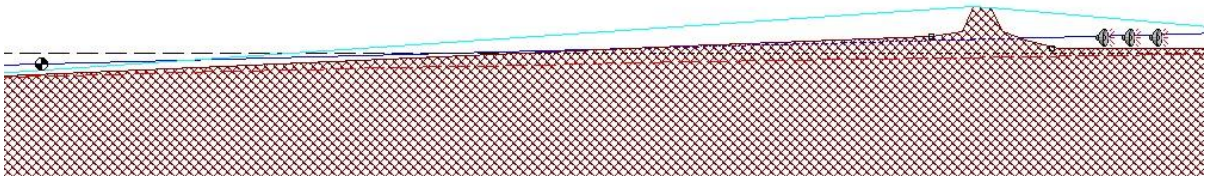
4.2.2 The section taken from the 3-D IMMI computer model shows the section through the quarry towards Higher Yennadon the perimeter bund has been assumed to be 5m high;



4.3 Quarry works at 10m below surface level

4.3.1 The predicted noise level at Higher Yennadon with mineral extract being carried out 10m below surface in the north west corner of the quarry extension (Zone I), the closest point to Higher Yennadon is 44 dB $L_{Aeq,T}$ (see Appendix 3). It should again be recognised that this is the worst case when all plant is running continuously.

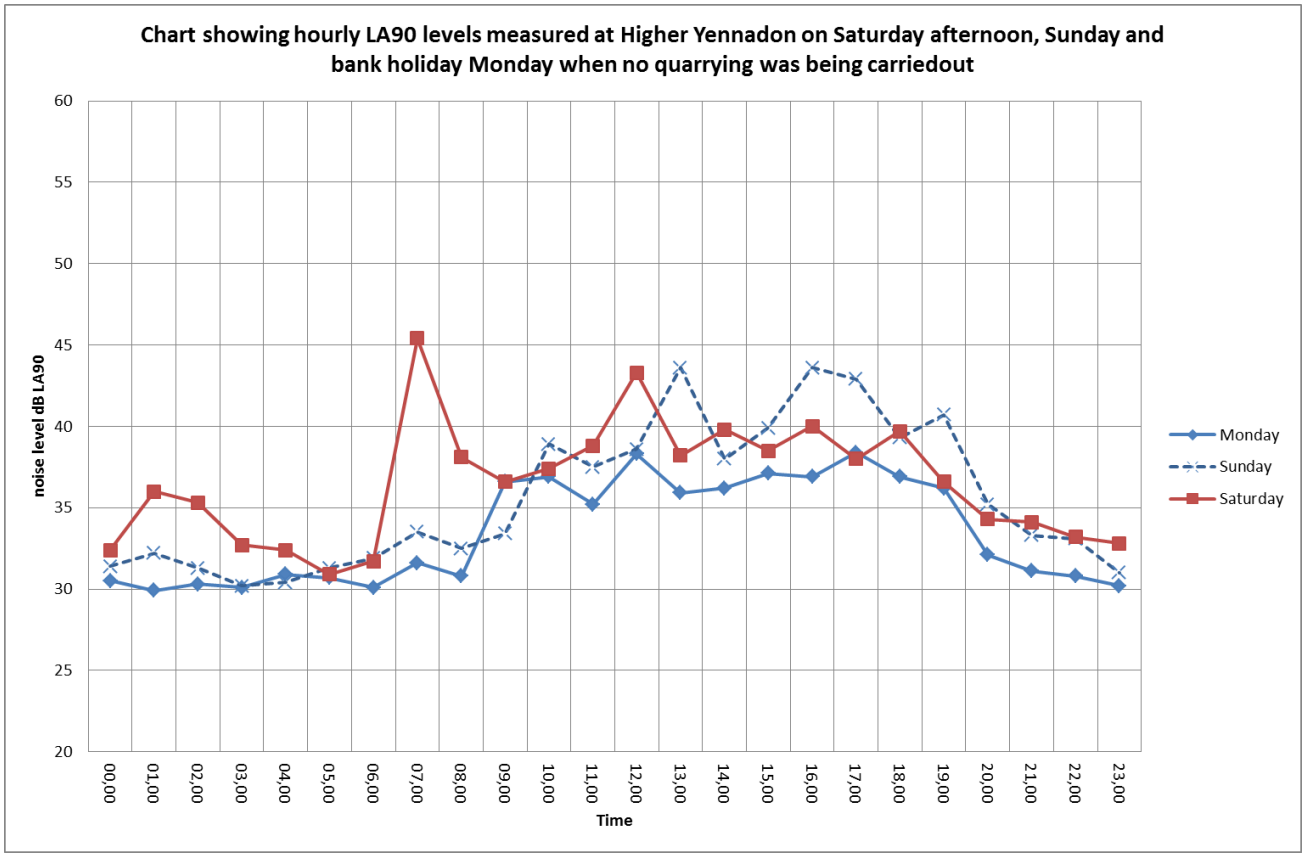
4.3.2 The section taken from the 3-D IMMI computer model shows the section through the quarry towards Higher Yennadon the perimeter bund has been assumed to be 5m high;



5.0 Quarry working Noise Criteria

5.0.1 NPPF sates that consents *"should be subject to a maximum of 55 dB $L_{Aeq,T}$, MPAs should aim to establish a noise limit at the noise-sensitive property that does not exceed the background level by more than 10dB(A). It is recognised, however, that this will in many circumstances, be difficult to achieve without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near that level as practicable during normal working hours (0700-1900) and should not exceed 55dB $L_{Aeq,T}$."*

5.0.2 The background noise levels taken from my survey in August 2011 at Higher Yennadon are shown in the chart below;



5.0.3 From the noise levels recorded from 1pm on Saturday 27th, Sunday 28th and Monday 29th August 2011 are shown in the table below;

Time	Saturday 27/08/2011 LA90	Sunday 28/08/2011 LA90	Monday 29/08/2011 LA90
07,00		33.5	31.6
08,00		32.5	30.8
09,00		33.4	36.6
10,00		38.9	36.9
11,00		37.5	35.2
12,00		38.6	38.3
13,00	38.2	43.6	35.9
14,00	39.8	38	36.2
15,00	38.5	39.9	37.1
16,00	40	43.6	36.9
17,00	38	42.9	38.4
18,00	39.7	39.3	36.9
mean	38		

5.0.4 The mean background noise level recorded over the weekend when the quarry was not working was 38 dB L_{A90} during the hours of 7am to 6pm.

5.0.5 The noise created by the quarrying activity should, if practical, be limited to no more than 10 dB above the background noise level or 48 dB L_{Aeq}.

5.0.6 With the bund constructed to a height of 5m, which is practically as high as a simple earth bund can be with a 15m width, the highest noise level predicted with stone extraction taking place at the top of Zone I will be just over the background plus 10 dB criteria, but just under the 50 dB $L_{Aeq,T}$. The strict imposition of the background noise plus 10 dB criteria would therefore be considered overly restrictive.

5.0.7 It can therefore be seen that the 50 dB $L_{Aeq,T}$ criteria proposed at the nearest residential property in my original report is appropriate for this site and is 5 dB lower than the maximum level recommended in the NPPF.

Appendix 1 Calculation of temporary work noise levels

Point calculation	Receiver point:	Higher Yenadon		Emission variant: Day										
		X = 1071.92	Y = 847.	Z = 244.60										
	Variant:	Variant 0												
Elem. type:	Single point source (ISO 9613)													
Noise prediction following ISO 9613	LfT = Lw + Dc - Adiv - Aatm - Agr - Afol - Ahous - Abar - Cmet													
Element	Label		Lw	Dc	Distance	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	LfT	LfT	LAT tot
			/ dB	/ dB	/ m	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB(A)	/ dB(A)
EZQi001	Slew 360														
		63 Hz	108	0	85.1	49.6	0	-3	0	0	0	0	61.4	35.2	
		125 Hz	117	0	85.1	49.6	0	1.6	0	0	0	0	65.8	49.7	
		250 Hz	111	0	85.1	49.6	0.1	10.6	0	0	0	0	50.7	42.1	
		500 Hz	107	0	85.1	49.6	0.2	5.9	0	0	0	0	51.4	48.2	
		1000 Hz	103	0	85.1	49.6	0.3	0.6	0	0	0	0	52.4	52.4	
		2000 Hz	101	0	85.1	49.6	0.8	0	0	0	0	0	50.6	51.8	
		4000 Hz	97	0	85.1	49.6	2.8	0	0	0	0	0	44.6	45.6	
		8000 Hz	94	0	85.1	49.6	9.9	0	0	0	0	0	34.5	33.4	
		Overall level												57.4	
EZQi002	Daewoo 360														
		63 Hz	112	0	228.1	58.2	0	-4.6	0	0	14.5	0	43.9	17.7	
		125 Hz	105	0	228.1	58.2	0.1	2.9	0	0	9.4	0	34.5	18.4	
		250 Hz	104	0	228.1	58.2	0.2	12.9	0	0	2.4	0	30.3	21.7	
		500 Hz	104	0	228.1	58.2	0.4	7.1	0	0	12.1	0	26.2	23	
		1000 Hz	100	0	228.1	58.2	0.8	0.8	0	0	22.9	0	17.3	17.3	
		2000 Hz	98	0	228.1	58.2	2.2	0	0	0	25	0	12.6	13.8	
		4000 Hz	95	0	228.1	58.2	7.5	0	0	0	25	0	4.4	5.4	
		8000 Hz	90	0	228.1	58.2	26.7	0	0	0	25	0	-19.8	-20.9	
		Overall level												27.5	
EZQi003	Akerman 360														
		63 Hz	116	0	233.5	58.4	0	-4.7	0	0	14	0	48.3	22.1	
		125 Hz	109	0	233.5	58.4	0.1	2.9	0	0	8.7	0	38.9	22.8	
		250 Hz	108	0	233.5	58.4	0.2	12.9	0	0	1.8	0	34.7	26.1	
		500 Hz	108	0	233.5	58.4	0.5	7.1	0	0	11.6	0	30.5	27.3	
		1000 Hz	104	0	233.5	58.4	0.9	0.8	0	0	22.3	0	21.7	21.7	
		2000 Hz	102	0	233.5	58.4	2.3	0	0	0	25	0	16.4	17.6	
		4000 Hz	99	0	233.5	58.4	7.7	0	0	0	25	0	8	9	
		8000 Hz	94	0	233.5	58.4	27.3	0	0	0	25	0	-16.7	-17.8	
		Overall level												31.8	
EZQi004	Onk Slew / Ripper														
		63 Hz	117	0	236.4	58.5	0	-4.7	0	0	13.6	0	49.5	23.3	
		125 Hz	110	0	236.4	58.5	0.1	2.9	0	0	8.2	0	40.3	24.2	
		250 Hz	109	0	236.4	58.5	0.2	12.9	0	0	1	0	36.4	27.8	
		500 Hz	109	0	236.4	58.5	0.5	7.1	0	0	10.4	0	32.5	29.3	
		1000 Hz	105	0	236.4	58.5	0.9	0.8	0	0	21.2	0	23.7	23.7	
		2000 Hz	103	0	236.4	58.5	2.3	0	0	0	25	0	17.3	18.5	
		4000 Hz	100	0	236.4	58.5	7.7	0	0	0	25	0	8.8	9.8	
		8000 Hz	95	0	236.4	58.5	27.6	0	0	0	25	0	-16.1	-17.2	
		Overall level												33.5	
EZQi005	Dumper														
		63 Hz	120	0	87.4	49.8	0	-3	0	0	0	0	73.2	47	
		125 Hz	102	0	87.4	49.8	0	1.6	0	0	0	0	50.6	34.5	
		250 Hz	103	0	87.4	49.8	0.1	10.7	0	0	0	0	42.4	33.8	
		500 Hz	101	0	87.4	49.8	0.2	5.9	0	0	0	0	45.1	41.9	
		1000 Hz	102	0	87.4	49.8	0.3	0.7	0	0	0	0	51.2	51.2	
		2000 Hz	99	0	87.4	49.8	0.8	0	0	0	0	0	48.3	49.5	
		4000 Hz	94	0	87.4	49.8	2.9	0	0	0	0	0	41.3	42.3	
		8000 Hz	89	0	87.4	49.8	10.2	0	0	0	0	0	29	27.9	
		Overall level												54.9	
Total noise impact level		63 Hz											73.5	47.3	
		125 Hz											66	49.9	
		250 Hz											51.6	43	
		500 Hz											52.4	49.2	
		1000 Hz											54.9	54.9	
		2000 Hz											52.6	53.8	
		4000 Hz											46.3	47.3	
		8000 Hz											35.5	34.4	59.3

Appendix 2 Calculation of quarry working noise levels at 5m below surface level

Point calculation	Receiver point:	Higher Yenadon	Emission variant: Day											
		X = 1071.92 Y = 847.	Z = 244.11											
	Variant:	Variant 0												
Elem. type:	Single point source (ISO 9613)													
Noise prediction following ISO 9613	LfT = Lw + Dc - Adiv - Aatm - Agr - Afol - Ahous - Abar - Cmet													
Element	Label		Lw	Dc	Distance	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	LfT	LfT	LAT tot
			/ dB	/ dB	/ m	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB(A)	/ dB(A)
EZQi001	Slew 360 Riddler														
		63 Hz	108	0	129.1	53.2	0	-3.6	0	0	9.3	0	49	22.8	
		125 Hz	117	0	129.1	53.2	0.1	2	0	0	4.5	0	57.2	41.1	
		250 Hz	111	0	129.1	53.2	0.1	12	0	0	0	0	45.6	37	
		500 Hz	107	0	129.1	53.2	0.2	6.6	0	0	3.4	0	43.5	40.3	
		1000 Hz	103	0	129.1	53.2	0.5	0.7	0	0	12.7	0	35.9	35.9	
		2000 Hz	101	0	129.1	53.2	1.2	0	0	0	17.5	0	29	30.2	
		4000 Hz	97	0	129.1	53.2	4.2	0	0	0	21.2	0	18.3	19.3	
		8000 Hz	94	0	129.1	53.2	15.1	0	0	0	24.4	0	1.3	0.2	
		Overall level												45.3	
EZQi002	Daewoo 360														
		63 Hz	112	0	228.1	58.2	0	-4.6	0	0	14.5	0	43.9	17.7	
		125 Hz	105	0	228.1	58.2	0.1	2.9	0	0	9.4	0	34.5	18.4	
		250 Hz	104	0	228.1	58.2	0.2	12.9	0	0	2.4	0	30.3	21.7	
		500 Hz	104	0	228.1	58.2	0.4	7.1	0	0	12.1	0	26.1	22.9	
		1000 Hz	100	0	228.1	58.2	0.8	0.8	0	0	22.9	0	17.3	17.3	
		2000 Hz	98	0	228.1	58.2	2.2	0	0	0	25	0	12.6	13.8	
		4000 Hz	95	0	228.1	58.2	7.5	0	0	0	25	0	4.4	5.4	
		8000 Hz	90	0	228.1	58.2	26.7	0	0	0	25	0	-19.8	-20.9	
		Overall level												27.4	
EZQi003	Akerman 360														
		63 Hz	116	0	233.5	58.4	0	-4.7	0	0	14	0	48.2	22	
		125 Hz	109	0	233.5	58.4	0.1	2.9	0	0	8.8	0	38.9	22.8	
		250 Hz	108	0	233.5	58.4	0.2	12.9	0	0	1.8	0	34.7	26.1	
		500 Hz	108	0	233.5	58.4	0.5	7.1	0	0	11.6	0	30.4	27.2	
		1000 Hz	104	0	233.5	58.4	0.9	0.8	0	0	22.3	0	21.6	21.6	
		2000 Hz	102	0	233.5	58.4	2.3	0	0	0	25	0	16.4	17.6	
		4000 Hz	99	0	233.5	58.4	7.7	0	0	0	25	0	8	9	
		8000 Hz	94	0	233.5	58.4	27.3	0	0	0	25	0	-16.7	-17.8	
		Overall level												31.7	
EZQi004	Onk Slew / Ripper														
		63 Hz	117	0	122.9	52.8	0	-3.4	0	0	9.1	0	58.5	32.3	
		125 Hz	110	0	122.9	52.8	0.1	1.9	0	0	4.6	0	50.7	34.6	
		250 Hz	109	0	122.9	52.8	0.1	11.9	0	0	0	0	44.2	35.6	
		500 Hz	109	0	122.9	52.8	0.2	6.6	0	0	3.4	0	46	42.8	
		1000 Hz	105	0	122.9	52.8	0.4	0.7	0	0	12.7	0	38.4	38.4	
		2000 Hz	103	0	122.9	52.8	1.2	0	0	0	17.5	0	31.5	32.7	
		4000 Hz	100	0	122.9	52.8	4	0	0	0	21.2	0	22	23	
		8000 Hz	95	0	122.9	52.8	14.4	0	0	0	24.4	0	3.4	2.3	
		Overall level												45.6	
EZQi005	Dumper														
		63 Hz	120	0	126.2	53	0	-3.5	0	0	8.9	0	61.6	35.4	
		125 Hz	102	0	126.2	53	0.1	1.9	0	0	4	0	43	26.9	
		250 Hz	103	0	126.2	53	0.1	12	0	0	0	0	37.9	29.3	
		500 Hz	101	0	126.2	53	0.2	6.6	0	0	2.1	0	39	35.8	
		1000 Hz	102	0	126.2	53	0.5	0.7	0	0	11.1	0	36.7	36.7	
		2000 Hz	99	0	126.2	53	1.2	0	0	0	15.7	0	29	30.2	
		4000 Hz	94	0	126.2	53	4.1	0	0	0	19.3	0	17.5	18.5	
		8000 Hz	89	0	126.2	53	14.8	0	0	0	22.5	0	-1.3	-2.4	
		Overall level												41.6	
Total noise impact level		63 Hz											63.6	37.4	
		125 Hz											58.3	42.2	
		250 Hz											48.6	40	
		500 Hz											48.5	45.3	
		1000 Hz											41.9	41.9	
		2000 Hz											34.9	36.1	
		4000 Hz											24.7	25.7	
		8000 Hz											6.4	5.3	49.4

Appendix 3 Calculation of quarry working noise levels at 10m below surface level

Point calculation	Receiver point:	Higher Yenadon	Emission variant: Day										
		X = 1071.92 Y = 847. Z = 244.11											
	Variant:	Variant 0											
Elem. type:	Single point source (ISO 9613)												
Noise prediction following ISO 9613	LfT = Lw + Dc - Adiv - Aatm - Agr - Afol - Ahous - Abar - Cmet												
Element	Label		Lw	Dc	Distance	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	LfT	LfT	LAT tot
			/ dB	/ dB	/ m	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB	/ dB(A)	/ dB(A)
EZQi001	Slew 360 Riddler														
		63 Hz	108	0	128.8	53.2	0	-3.6	0	0	12.6	0	45.7	19.5	
		125 Hz	117	0	128.8	53.2	0.1	2	0	0	9.2	0	52.6	36.5	
		250 Hz	111	0	128.8	53.2	0.1	12	0	0	1.8	0	43.9	35.3	
		500 Hz	107	0	128.8	53.2	0.2	6.6	0	0	10.4	0	36.5	33.3	
		1000 Hz	103	0	128.8	53.2	0.5	0.7	0	0	20.5	0	28.1	28.1	
		2000 Hz	101	0	128.8	53.2	1.2	0	0	0	25	0	21.6	22.8	
		4000 Hz	97	0	128.8	53.2	4.2	0	0	0	25	0	14.6	15.6	
		8000 Hz	94	0	128.8	53.2	15.1	0	0	0	25	0	0.7	-0.4	
		Overall level												40.4	
EZQi002	Daewoo 360														
		63 Hz	112	0	228.1	58.2	0	-4.6	0	0	14.5	0	43.9	17.7	
		125 Hz	105	0	228.1	58.2	0.1	2.9	0	0	9.4	0	34.5	18.4	
		250 Hz	104	0	228.1	58.2	0.2	12.9	0	0	2.4	0	30.3	21.7	
		500 Hz	104	0	228.1	58.2	0.4	7.1	0	0	12.1	0	26.1	22.9	
		1000 Hz	100	0	228.1	58.2	0.8	0.8	0	0	22.9	0	17.3	17.3	
		2000 Hz	98	0	228.1	58.2	2.2	0	0	0	25	0	12.6	13.8	
		4000 Hz	95	0	228.1	58.2	7.5	0	0	0	25	0	4.4	5.4	
		8000 Hz	90	0	228.1	58.2	26.7	0	0	0	25	0	-19.8	-20.9	
		Overall level												27.4	
EZQi003	Akerman 360														
		63 Hz	116	0	233.5	58.4	0	-4.7	0	0	14	0	48.2	22	
		125 Hz	109	0	233.5	58.4	0.1	2.9	0	0	8.8	0	38.9	22.8	
		250 Hz	108	0	233.5	58.4	0.2	12.9	0	0	1.8	0	34.7	26.1	
		500 Hz	108	0	233.5	58.4	0.5	7.1	0	0	11.6	0	30.4	27.2	
		1000 Hz	104	0	233.5	58.4	0.9	0.8	0	0	22.3	0	21.6	21.6	
		2000 Hz	102	0	233.5	58.4	2.3	0	0	0	25	0	16.4	17.6	
		4000 Hz	99	0	233.5	58.4	7.7	0	0	0	25	0	8	9	
		8000 Hz	94	0	233.5	58.4	27.3	0	0	0	25	0	-16.7	-17.8	
		Overall level												31.7	
EZQi004	Onk Slew / Ripper														
		63 Hz	117	0	122.6	52.8	0	-3.4	0	0	13.2	0	54.4	28.2	
		125 Hz	110	0	122.6	52.8	0.1	1.9	0	0	10.1	0	45.1	29	
		250 Hz	109	0	122.6	52.8	0.1	11.9	0	0	2.9	0	41.3	32.7	
		500 Hz	109	0	122.6	52.8	0.2	6.6	0	0	11.6	0	37.9	34.7	
		1000 Hz	105	0	122.6	52.8	0.4	0.7	0	0	21.6	0	29.4	29.4	
		2000 Hz	103	0	122.6	52.8	1.2	0	0	0	25	0	24.1	25.3	
		4000 Hz	100	0	122.6	52.8	4	0	0	0	25	0	18.2	19.2	
		8000 Hz	95	0	122.6	52.8	14.3	0	0	0	25	0	2.9	1.8	
		Overall level												38.8	
EZQi005	Dumper														
		63 Hz	120	0	125.9	53	0	-3.5	0	0	12.5	0	58	31.8	
		125 Hz	102	0	125.9	53	0.1	1.9	0	0	9.1	0	37.9	21.8	
		250 Hz	103	0	125.9	53	0.1	12	0	0	1.7	0	36.2	27.6	
		500 Hz	101	0	125.9	53	0.2	6.6	0	0	10.4	0	30.8	27.6	
		1000 Hz	102	0	125.9	53	0.5	0.7	0	0	20.4	0	27.4	27.4	
		2000 Hz	99	0	125.9	53	1.2	0	0	0	25	0	19.8	21	
		4000 Hz	94	0	125.9	53	4.1	0	0	0	25	0	11.9	12.9	
		8000 Hz	89	0	125.9	53	14.7	0	0	0	25	0	-3.7	-4.8	
		Overall level												35.5	
Total noise impact level		63 Hz											60.2	34	
		125 Hz											53.6	37.5	
		250 Hz											46.6	38	
		500 Hz											41.2	38	
		1000 Hz											33.6	33.6	
		2000 Hz											27.4	28.6	
		4000 Hz											20.8	21.8	
		8000 Hz											5.6	4.5	43.8

LEGEND:-

(A) VEGETATED SLOPE TO REMAIN

(B) EXISTING BUND UN-VEGETATED AREA HATCHED TO BE PROFILED (WEST FACING SLOPE ANGLE TO BE REDUCED AND LANDSCAPED) SOILED AND PLANTED

(C) LANDSCAPE BUFFER ZONE - TO BE PLANTED / PROTECTED TO ALLOW TREES / VEGETATION TO ESTABLISH. ONCE ESTABLISHED FENCING CAN BE MOVED INWARDS

(D) POSITION OF V-NOTCH DUG INTO OVERBURDEN TO ALLOW ESTABLISHMENT OF VEGETATION. THIS WILL PROGRESS 1-2 MONTHS AHEAD OF TOPSOIL STRIPING

(E) POSITION OF 3m WIDE, 45° ANGLED SLOPE THROUGH OVERBURDEN. TO BE PLANTED IMMEDIATELY TO ENABLE VEGETATION TO ESTABLISH

(F) MAX 1m HIGH BUND WITH TREES PLANTED ON OUTSIDE FACE TO BE LANDSCAPED TO PROVIDE 'NATURAL' PROFILE

(G) PROPOSED NEW TEMPORARY BUND (MAX 4m HIGH) (TREES / SHRUBS PLANTED ON OUTSIDE FACE ON LOWER 1m ; UPPER SLOPE GRASSED. UPPER BUND TO BE REMOVED AS PART OF RESTORATION WORKS

(1, 2&3) FOR PHASE 1, 2 & 3 LAYOUTS, SEE DRAWING 7397-08

VEGETATED AREAS

NEW BUND'S TO BE LANDSCAPED

EXISTING UN-VEGETATED BUND TO BE BE RE-GRADED, SOILED AND VEGETATED

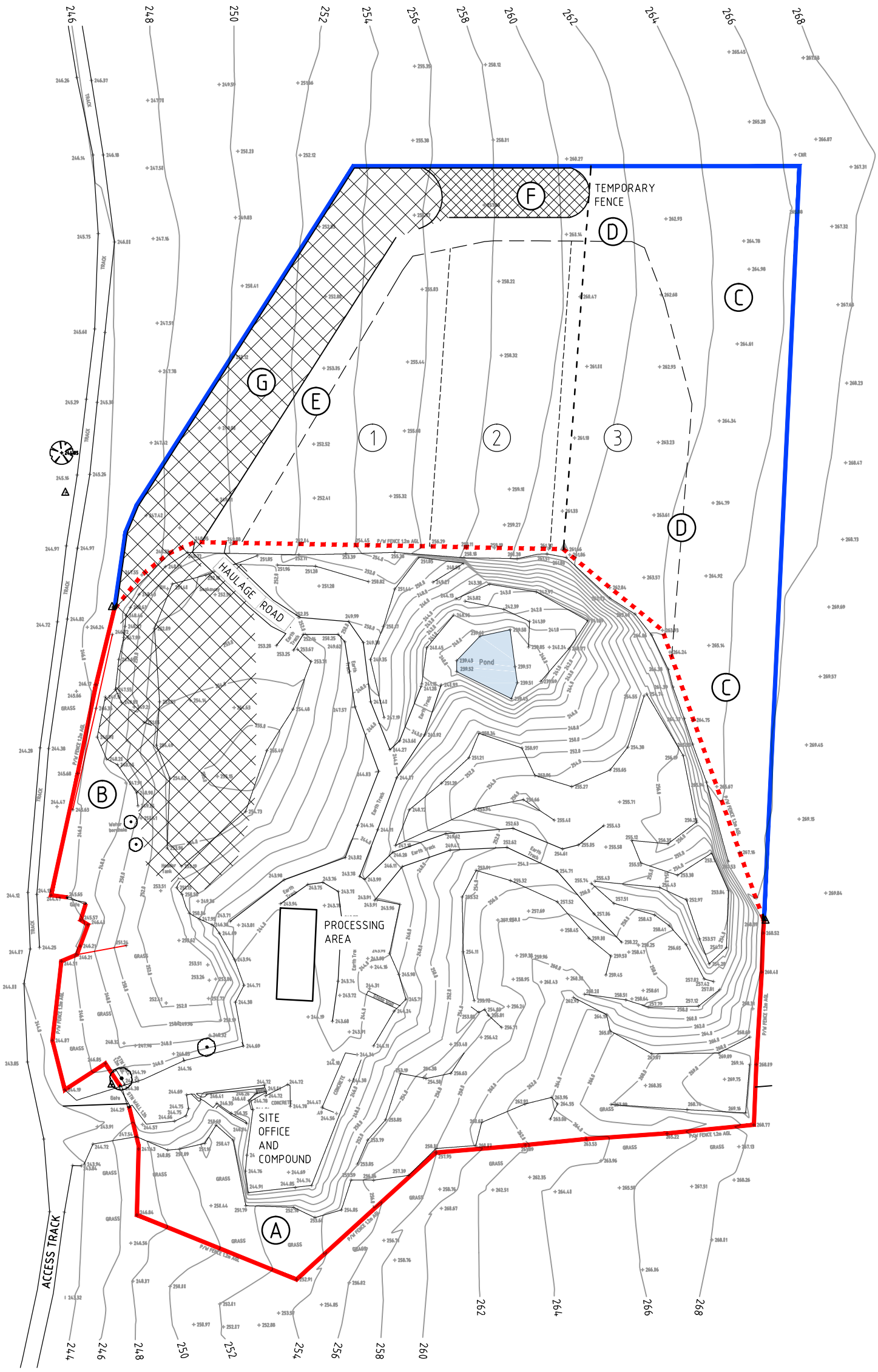
WORKING AREA

POND

CURRENT SITE BOUNDARY

PROPOSED SITE BOUNDARY

CONTOURS BASED ON SURVEY DATED OCTOBER 2014



Issue	Description	Date	Drwn	Chkd
R2	REVISED DRAWING	17JUN16	TG	AR
R1	REPORT ISSUE	10JUN15	TG	AR

Client: Yennadon STONE LIMITED

Status: REPORT

First Issue Signatures

Scales: 1:1000 — Author: T. Grimes

Original Size: A3 — Checker: A. Robertson

Project: PROPOSED EXTENSION TO YENNADON QUARRY

Title: PRE EXCAVATION WORKS LAYOUT PLAN

JOHN GRIMES PARTNERSHIP
Leonards Road, Ivybridge, Devon, PL21 0RU
Tel: +44 (0)1752 690533 Fax: +44 (0)1752 690570
post@johngrimes.co.uk www.johngrimes.co.uk

Project No. 7397 — Drawing No. RP-01 — Rev. R2

50mm on Original

FILENAME: P:\7000-7999\7397 Yennadon Quarry\Drawings\Drawings\JGP\Drawings\Current\Restoration Plan\7397-RP01-R2, PLOTTED BY: Tim Grimes, DATE: 24 June 2015 11:32:47