April 2025

Proposed Sand and Gravel Quarry. Land off Bourbles Lane, Preesall

Dr Andrew Buroni
Human Health Technical Note
Written Response to Examination Questions

Planning Inspectorate Reference: APP/6002168

Local Authority Reference: LCC/2023/0030

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1 Summary

1.1.1 In the absence of any evidence of a health impact from the proposed development from any party; given that all tangible environmental parameters with the potential to impact upon health have been satisfactorily addressed; and that the Statement of Case from, and Statement of Common Ground with Lancashire County Council (LCC) lacks any mention of health impact (solely focusing on noise/dust amenity impacts), I was not called to the Inquiry.

1.1.2 However, a series of questions were raised by the Rule 6 Party, to which I am providing this written response.

1.1.3 Please see below for the questions framed, and the response provided.

2 Question 1

2.1 Rule 6 Question

2.1.1 You state in 2.6.2 of your note: “The existence of a hazard by itself does not constitute a risk, it is only when there is a hazard source, a receptor and a credible pathway that there is potential for a health risk”.

2.1.2 In terms of pathway, the pathway to nearby receptors has been referred to as HIGHLY EFFICIENT throughout the appellants assessments, and the particulate pod commissioned by rule 6 group also evidences that there is a pathway between hazard, source and receptor.

2.1.3 **Do you agree that all three of the criteria you have stipulated are indeed present for the nearby residents and therefore there is a potential health risk considering my residents are EXTREMELY close to quarry workings which needs to be carefully assessed?**

2.2 Written Response

2.2.1 Yes, the Hazard is present, as are Receptors, and a credible mode of Exposure. This is why the air quality assessment was scoped in to provide an objective assessment to recognised UK air quality standards protective of health.

2.2.2 Please note that the UK air quality standards are derived through a process that applies decades of clinical and epidemiological research into regulatory thresholds, primarily guided by the Committee on the Medical Effects of Air Pollutants (COMEAP). This independent expert body reviews global health studies, including those from the World Health Organization (WHO), to identify the physiological health risks associated with pollutants (cardiovascular disease, stunted lung growth, asthma etc), and are updated as and when the continually evolving health evidence warrants it.

3 Question 2

3.1 Rule 6 Question

3.1.1 In 2.4.5 of your technical note, you state that " the Air quality Assessment met both the original scoping opinion geared to meeting the regulatory requirements, and the scoping opinion supplement to better respond to risk perceptions… this included a dedicated " Health Impact Assessment " explaining how the worst case concentration projections lies well within air quality objectives….."

3.1.2 The assessment mentioned above has simply concluded that because there is currently a PM_{10} concentration of 8.89ug/m3 there is little risk that PM concentrations will exceed the target values.

3.1.3 There is then a conclusion made that because PM_{10} concentrations are not likely to exceed the target level "the potential for emissions from the development of PM_{10} concentrations to affect human health receptors is predicted to be negligible".

3.1.4 Are you stating that this unconnected reasoning translates as a Health Impact Assessment?

3.1.5 Are you implying that remaining below annual Air Quality Objective Levels is sufficient to act as a Health Impact Assessment ?

3.2 Written Response

3.2.1 As explained in the context rationalising the scope of my Technical Note, following formal scoping demonstrating that an air quality assessment would be sufficient to meet the regulatory planning process protective of health, a supplementary health study was encouraged to respond to residual risk perceptions, and was further steered to focus on silica specific Health and Safety Executive and NHS guidance.

> *"Given the concerns that have been expressed I would advise that your assessment should contain an analysis of the human health impacts of dust including silica rich particulates. The assessment should take into account guidance from the HSE and NHS regarding silica dust impacts including any other research into silica dust related health impacts"*

3.2.2 As mentioned in my Technical Note, the Air Quality Assessment met both the original scoping opinion geared to meeting the regulatory requirement, and the scoping opinion supplement to better respond to risk perceptions. This included:

I. a legislative and policy review, framing all pertinent air quality objectives protective of health (CD1.22 Section 2);

II. a technical guidance review, framing all pertinent air quality, health and mineral extraction specific assessment guidance (CD1.22 Section 2.4);

III. a health impact study review, providing a summary of pertinent occupational and public health research on the health effects from dust and mineral extraction (CD1.22 Section 2.5);

IV. a hazard characterisation, baseline and exposure rationale (to establish any credible hazard-receptor- exposure pathway to assess) (CD1.22 Section 4);

V. a dust assessment (CD1.22 Section 5); and

VI. a dedicated Human health assessment section (CD1.22 Section 6); explaining:

(a) How the worst-case projected concentration at any receptor remains well within air quality objectives which have been set to be protective of health for PM10 and PM2.5; (CD1.22 Paragraph 61.17);

(b) The absence of any significant Respirable Crystal Silica public health exposure pathway (CD1.22 Section 6.2);

(c) That transport movements fall well below the threshold criteria for air quality assessment, and is not considered significant in air quality or health terms (CD1.22 Section 7.0); and

(d) That coarse dust, (i.e. not small enough to bypass the respiratory defence or impact upon physical health) are considered a negligible impact when following the recognised Institute for Air Quality Management (IAQM) guidance (CD1.22 Section 8).

3.2.3 Yes, I am saying that that what was requested in the formal Scoping Opinion and the Scoping Supplement represents the Health Analysis requested.

3.2.4 No, I am not implying that remaining below annual Air Quality Objective Levels is sufficient to act as a Health Impact Assessment or would meet the very specific scope requested by the Planning Officer. I am saying that meeting the requested Air Quality Objective Levels is the legal requirement for planning purposes protective of health. This is true for a sand quarry, a power station, or the construction and operation of a hospital.

4 Question 4

4.1 Rule 6 Question

4.1.1 In 2.6.7 of your report, you state that "The assessment submitted has already concluded that changes in air quality are negligible, remain well within air quality objective thresholds which are informed by PROVEN DOSE RESPONSE RESEARCH which are protective of health, and do not present any significant risk to the achievement of air quality standards and objectives locally. That does not mean that any possible individual risk can be scientifically excluded, but rather that such risk has been assessed properly and has been appropriately assessed to fall within acceptable limits".

4.1.2 Although it has been concluded that changes in Air Quality are likely to remain within Air Quality Objective thresholds

4.1.3 Has there been any analysis of the likely magnitude of the peaks; their duration; and potential risk of adverse health impacts resulting from repeat, short term exposures on nearby residents?

4.2 Written Response

4.2.1 Any concern for short term, intermittent and transient emissions to air from specific equipment, activity and phasing and associated worst case process contributions from what is a wet extractive process would have been directed to and answered by the air quality Expert Witness at the inquiry.

4.2.2 No, from a health perspective, and given my review of the air quality assessment short term, intermittent and transient peaks are not significant, and again, remain well within air quality objective thresholds protective of health. They wouldn't be of a concentration or exposure to quantify any adverse health outcome. My response to the following question, provides additional clarity to this question.

4.2.3 To put it into context, much of the activity and associated emissions are not dissimilar to construction activities, or agriculture.

5 Question 5

5.1 Rule 6 Question

5.1.1 With regards to dose response studies my understanding is that they are generally used to inform decision makers regarding the likely effects of pollutants on a large population level.

5.1.2 I am aware that CRF calculations associated with health risks regarding air quality can be applied at specific sites, but there are challenges in using these methods.

5.1.3 Was the data used appropriate to the specifics of this site?

5.1.4 Also, can details of the data used be provided?

5.2 Written Response

5.2.1 Yes, the Rule 6 understanding is correct and corroborates with the evidence I have provided. Quantitative exposure response assessments a generally applied where the change in air quality is greater than 10ug for a population over a 100,000. It is an assessment I would typically provide on select Nationally Significant Infrastructure Projects (NSIP)s, but even then, only when proportionate to what is proposed, and if there is a likely health risk.

5.2.2 As explained in sections 2.6.6 to 2.6.16 of my Technical Note, the relative change in emission concentration and exposure remain orders of magnitude lower than is required to quantify any measurable adverse health outcome.

5.2.3 Yes the data and risk ratios applied were appropriate, and yes, details to back my conclusion on this are provided as follows.

5.2.4 I ran a highly hypothetical assessment, where we firstly explored what the highest burden of poor health is throughout all of Lancashire. As per the most recent OHID data below, within Lancashire, Blackpool UA shows the highest mortality rate from respiratory diseases for all ages (per 100,000 of the population), and Burnley shows the highest mortality rate within the districts.

Mortality rate from respiratory disease in Lancashire-14 districts (all ages)

Unitary Authorities (UA) and Districts		**Rate**
UA	Blackburn with Darwen	171.94
	Blackpool	**197.47**
District	Burnley	**170.73**
	Chorley	137.95

Unitary Authorities (UA) and Districts		Rate
	Fylde	123.25
	Hyndburn	170.72
	Lancaster	126.59
	Pendle	146.46
	Preston	157.08
	Ribble Valley	103.40
	Rossendale	147.59
	South Ribble	124.86
	West Lancashire	115.94
	Wyre	133.83

Source: OHID data using 2022-2024 average.

5.2.5 These were then converted into mortality rates per 1,000 of the population, and applied as a universal constant (meaning, I assumed everyone in the assessment has the worst health in the area):

Blackpool: (197.47 /100,000) x 1,000 = 1.97 per 1,000

5.2.6 The following appropriate Relative Risks were then adopted:

1.04 per 10 µg / m^3 for PM_{10} [1]

1.08 per 10 µg / m^3 for $PM_{2.5}$ [2]

[1] Chen and Hoek (2020) as cited in World Health Organisation (2021). WHO global air quality guidelines. Available at: https://iris.who.int/server/api/core/bitstreams/551b515e-2a32-4e1a-a58c-cdaecd395b19/content,

[2] Chen and Hoek (2020) as cited in COMEAP (2022). Statement on quantifying mortality associated with long-term exposure to $PM_{2.5}$. Available at: https://assets.publishing.service.gov.uk/media/623302158fa8f504aa780865/COMEAP_Statement_on_PM2.5_mortality_quantification.pdf,.

5.2.7 The Assessment for PM_{10} equated to the following:

Using the equation $RR_{\Delta C}=e^{ln(RR10) \times (\Delta C/10)}$ where $_{\Delta C \text{ is}}$ 15 ug for PM10:

$RR_{15}=e^{ln(1.04) \times (1.7/10)} = 1.06$

Population attributable risk = 1.06 – 1 / 1.06 = 0.06

Attributable mortality = 1.97 x 0.06

Attributable mortality = **0.11** per 1,000 population

5.2.8 The Assessment for $PM_{2.5}$ equated to the following:

Using the equation $RR_{\Delta C}=e^{ln(RR10) \times (\Delta C/10)}$ where $_{\Delta C \text{ is}}$ 1.5 ug for PM2.5:

$RR_{1.5}=e^{ln(1.08) \times (1.7/10)} = 1.012$

Population attributable risk = 1.012 – 1 / 1.012 = 0.012

Attributable mortality = 1.97 x 0.012

Attributable mortality = **0.023** per 1,000 population

5.2.9 What this concludes is that even when I applied the highest burden of poor health as a universal constant (meaning I inflate relative sensitivity) for a hypothetical 1000 people (meaning I inflate exposure) exposed to the maximum worst case guidance reference of 15ug PM_{10} as an annual average (meaning I assume 1000 people live in the active quarry), and then I assuming 10% of the PM_{10} is $PM_{2.5}$, and I apply the higher risk ratio for $PM_{2.5}$ to an inflated worst case concentration to an inflated receptor exposure, one still cannot quantify any measurable adverse health outcome.

5.2.10 This is why I state in my Technical Note that such a result is to be expected given the project has already demonstrated that the change in air quality is negligible; that air quality will remain well within recognised air quality objectives thresholds protective of health; and given that the County Council is not pursuing any points regarding unacceptable health impacts from changes in air quality. The change is just not significant or sufficient to quantify any change in health when applying the accepted scientific health evidence. On this basis, the proposed development remains well within air quality objectives protective of health, and the absolute change does not present any measurable risk to local community health, even when assuming the highest burden of poor health as a universal constant for all residents.

5.2.11 Going back to the previous question, this is also why it is not possible to quantify any health outcome from temporary peaks, they are just not significant.

6 Question 2

6.1 Rule 6 Question

6.1.1 In 2.6.11 you refer to " a quantitative exposure response assessment ".

6.1.2 <u>In this assessment what increase, over the current baseline in PM levels were assumed?</u>

6.2 Written Response

6.2.1 As per the Air quality Proof of Evidence (see Para 6.1.29) I applied 15µg/m^3 for PM_{10}, and assumed 10% of this was $PM_{2.5}$ (1.5 µg/m^3). Please note however, that this is both a worst case concentration, and exposure scenario, inferring 1000 will be living within the highest concentration within an active quarry.