
From: Curley, Jane
Sent: 30 May 2023 09:42
To: Planning Comments (SMDC)
Subject: FW: Moneystone Quarry further safety concerns over silica sand itself .SMD/2019/0646

Categories:

Jane Curley (Mrs)
Senior Planning Officer (Majors &
Commercial) Mobile

From: SheilaWalters
Sent: Sunday, May 21, 2023 1:39 PM
To: Curley, Jane
Cc: Stokes, Andrew
Subject: Moneystone Quarry further safety concerns over silica sand itself .



Dear Mrs Curley,

Objection on grounds of health and safety issues at Moneystone Quarry

A simple question to start .

Would you think a holiday development in an asbestos quarry would be something that a planning officer with the experience, knowledge and wisdom such as yourself would entertain as a potential winner and look seriously into, if an application was made, or would you be inclined to turn it down without a hesitation even if there were aspects of the design that seemed acceptable as a way of a restoration plan or reuse of the site ?

Well I'm sure you wouldn't in the former example and the latter option would be your preference of choice.

Though asbestos quarries are still around in the world in about 6 countries and the popularity of asbestos is currently rising in developing nations, we are so aware of the dangers of asbestos related illnesses that even disposal of products made from it has to be rigorously policed in strictly controlled recycling centres or allocated dumps.

Even so, the world health organisation claims more than 107,000 workers still die each year from a related disease and notably in addition, several thousand people die from asbestos in the environment each year.

You may be wondering why I have mentioned the above as a prelude to yet another objection to the Moneystone scheme and that is of course to do with silica and the silica sand quarry into which the development is planned to be sited.

We have recently explored the safety risks of deep water drowning in this flooded, former silica sand extraction pit and Abbeydale BEC have provided ample evidence in past reports (passim) of the potential risks of collapses and rock failures with the confines of quarry 3 that make it hazardous.

But apart from the dangers of the instability of the quarry itself and even more so the dangers from quicksands and landslides within the lagoon, where the un-surveyed faces of saturated sands form the edges on to which lodges will be sited, another, seemingly overlooked safety aspect of this proposal, is the potential exposure of those residents staying in the midst of these quarry faces to the risk of silica itself.

Health surveillance by the HSE has proved that in crystalline form, respirable crystalline silica (RCS) is responsible for the death of 600 people per year in Great Britain with 450 of those to workers in construction industry. What's more, an estimated 50,000 workers are exposed to silica dust globally.

The importance of the dangers of silica dust must now be realised, especially with what is known about how dangerous asbestos is. The evidence of the comparative similarity of the dangers of silica dust is also there for all to see.

A dust which is made up of silicate materials is as hazardous in the same way as asbestos fibres are, and thus as a respirable dust which is just as lethal, if not more lethal, in comparison to asbestos dust, it has to be considered in the same dangerous category as far as the public is concerned.

But because it isn't known to people as being the same risk as asbestos, the dangers seem to be less of a concern to those **without** the scientific knowledge.

At Moneystone Quarry, although dust has been considered from the point of view of the construction stages in establishing the development and is conditioned on a shorter basis during that phase, what has been overlooked, or not considered at all, is the longer, accumulated exposure of those residents staying there to the dust hazard emanating from the site.

With the amount of vehicles using the site in order to make it a viable economic enterprise, the ongoing problem of airborne pollution from traffic, not only just in terms of exhaust fumes and other particles associated with cars, will be high and prolonged, but also with that continuous movement in, out and around the site, there will be a hitherto unconsidered hazard arising from the inevitable disturbance of the residual silica dust which will be weathering out of the open exposures of the inner quarry faces and be circulating around within its confined space and as a result becoming more concentrated.

If you were told that this accumulated airborne dust which you were inevitably inhaling was asbestos, you would, I hope, regard the site as hazardous and give it a wide berth even for a short stay.

Likewise if the dangers of silica dust are comparable in terms of potency and risk, especially with what is known about how dangerous asbestos is, then putting oneself at risk by staying in such an environment is equally foolish and from a planning perspective inducing the public into such circumstances, for whatever reason, is both unacceptable and irresponsible.

This respirable silica dust causes lung disease and lung cancer. It only takes a very small amount of airborne silica dust to create a health hazard.

If we look at the scientific background and the burgeoning knowledge of the harmful effects of silica, then you will be able to see very clearly that there is irrefutable evidence that the planned development within this quarry is one that should be curtailed and an alternative restorative after care plan should be encouraged or imposed as a safer option.

Scientific and medical background

We are fully aware of the facts that there is worldwide recognition of the dangers associated with asbestos exposure.

However, while it is increasingly common to see an article in which silica is dubbed “the new asbestos”, the effects caused by silica exposure have attracted far less attention. But that has changed recently and silica dust is now getting the adverse publicity it thoroughly deserves.

In the field of medicine at least, the risks associated with prolonged and extensive exposure to free crystalline silica have been recognised for centuries. Silica exposure is associated with the development of an array of diseases, including silicosis, lung cancer and chronic obstructive pulmonary disease.

However it has now been recognised that sand and gravel quarrying should not be located close to housing. This is the conclusion drawn from evidence gathered internationally in recent years and counters UK Government historic guidance now nearly 20 years out of date.

Recent research and case law into microscopic particles of silica that exist within sand dust show that the dust can travel many kilometres and is responsible for a disease called silicosis. Silicosis is associated with cancer, asthma, breathing difficulties, COPD, lung scarring and other lung diseases. It particularly affects the very young, the very old and those with existing lung conditions.

The key points of the research are as follows:

In 2020 the World Health Organisation published a Report that PM 10 and PM 2.5 (small dust particles) were contributing to 4.2 million deaths globally by penetrating deep into the lungs and entering the blood stream causing arterial disease in the heart and brain and cancer and that maternal exposure to air pollution can lead to low birth weight and congenital defects in the new born.

Around the world countries have now woken up to the dangers:-

Canada:

The Canadian Centre for Occupational Health and Safety has issued the following edicts for Silica dust.

1. May cause cancer if inhaled
2. Very toxic if exposed to long term inhalation
3. American Conference of Government Industrial Hygienists recommend exposure limits for silica of 25 micrograms

per cubic meter over an 8 hour day.

An advocacy group liaising with government and the aggregates industry based in Ontario, Canada, has commented on dust blown off site as follows

“Recent studies show that fine particulates pose a greater danger to our health than better known kinds of air pollution such as smog, sulphur dioxide and carbon monoxide. There is incontrovertible evidence that increased PM10 is related to increases in heart and lung disease and premature death in those with pre-existing disease. Mitigation measures for quarries in dust suppression are inadequate”

America:

In the US concern about dust has led the “Environmental Protection Agency” (EPA) through the “Clean Air Act” to regulate national and regional rules to reduce emissions. Over time, the EPA have reduced the maximum allowable exposure to concentrations of PM 2.5 to 12 micrograms per cubic metre.

A US based organisation, Environmental Working Group state that “none of the air quality standards for silica are adequate to protect people living or working near sand mining sites. The danger of airborne silica is especially acute for children. Freshly mined silica is more damaging to the lungs by producing a more severe inflammatory response as opposed to older, smoother particulates weathered by heat, wind and moisture such as silica dust blown from crop land”. (This is now established science). “Silica air pollution has become a danger for residents near open sand mining and processing. Children, older adults and others with existing disease are especially at risk.” As a result, 6 States have set their own standards ranging from 3 micrograms per cubic metre in California to 0.06 micrograms in New York”. The EWG have concerns for residents 750 – 1500 metres from excavation sites. Silica levels measured near open sand mining in Wisconsin and Minnesota were at least 10 times higher than the 3 micrograms per cubic metre recommended limit.

The USA National Institute of Health quotes “residents near quarries and sand and gravel operations are potentially exposed to respirable crystalline silica. Citizens living near sand and gravel mines in Wisconsin have found layers of silica dust on their belongings and are concerned about the health of children attending a school a quarter of a mile away.”

Symptoms of silicosis may not manifest themselves for 15 to 20 years after exposure and the negative effects on health from silica dust exposure will not be fully understood for decades.

The Occupational Safety and Health Administration (OSHA) which is the American equivalent of UK Government HSE, had in 2018 announced a limit of 25 micrograms per cubic metre of PM2.5 over an 8 hour day the same as the standard set by the American Conference of Government Industrial Hygienists . They hope this new edict will save 700 lives per year and prevent 1600 new cases of silicosis annually.

The British Government HSE states that the workplace exposure limit (set in 2002) is 100 micrograms per cubic metre over an 8 hour day – 4 times that of the USA, Canada and Australia. Those limits of UK Government HSE are now 18 years out of date.

The World Health Organisation has an Air Quality guideline of 20 micrograms per cubic metre. They state further that “there is no evidence of a safe level of exposure or threshold below which no adverse health effects occur”.

United Kingdom:

In 2016 the Royal Colleges of Physicians and Paediatricians produced a report concluding that the concentration limits set by Government and the WHO are not safe and improved air pollution monitoring was needed.

Also in 2016, the Institute Air Quality Management stated “ the location of residential areas, and schools within 1 kilometre of a sand and gravel excavation site should be identified and need to consider topography and prevailing winds”.

In November 2017 ‘The Lancet’ published an article on child and adolescent health saying that PM2.5 was associated

with pre-term birth and low birth weight, both of which increase the risk of developing asthma in later life.

In 2018 the British Medical Journal quoted a study finding first evidence of particulates PM_{2.5} and less passing through pregnant mothers' lungs and lodging in the placenta harming unborn children.

In 2019 the British Medical Journal printed an article that studied 95 million hospital admissions in the USA having measured the PM_{2.5} levels the day before admission and were able to confirm previous association between PM_{2.5} and respiratory, cardio vascular, Parkinson's Disease and Diabetes Mellitus. Further for every one microgram per cubic metre increase in PM_{2.5} there were an extra 2050 hospital admissions.

In March 2020 a BBC 2 Horizon documentary, Toxic Town, (background available at <https://www.bbc.co.uk/programmes/m000gp8s>) highlighted a major legal case from Corby Northamptonshire in 2009 which shed new light on the question of how far small dust particles can travel on the wind. The case related to the demolition of the old Corby Iron and Steel Works in Northamptonshire and the subsequent reclamation of land contaminated with toxic waste. The court accepted findings of an arithmetic error in a 1995 research report "The Environmental Effect of Dust from Surface Mineral Workings". The effect of this error was that the PM₁₀ particles would be typically carried 3 kilometres on the wind rather than the 1 kilometre previously thought. (For PM_{2.5} particles, the distances are far greater). The case proved for the first time in history that there is a link between toxic substances released into the air and children born with birth defects.

In December 2020, a coroner's court in London ruled that air pollution contributed to the death of an 8 year old asthmatic girl. This is the first time a person in the UK has had air pollution listed as a cause of death. <https://url6.mailanyone.net/scanner?m=1q0iLS-0003JH-5C&d=4%7Cmail%2F90%2F1684672200%2F1q0iLS-0003JH-5C%7Cin6d%7C57e1b682%7C10609168%7C13286642%7C646A1102E770EDA5D797DE727A6933E8&o=%2Fphti%3A%2FbtsFyt.52K9l%2FYp&s=YlvcdjPyE5cRwpXiRlesvX7Kkek>

Silica particulates pose a bigger threat to health than better known types of air pollution. Silicosis is incurable and insidious, building up over years of exposure to dust from sand and gravel extraction.

There is growing international agreement that gravel and sand extraction close to housing exposes local residents to silicosis, chronic obstructive pulmonary disease (COPD) and cancer. The old and the young are vulnerable. Silicosis takes years to develop and is incurable.

There is significant scientific evidence and case law supporting this in the UK.

Carcinogenic Health Risks of PM₁₀ Silica Particles

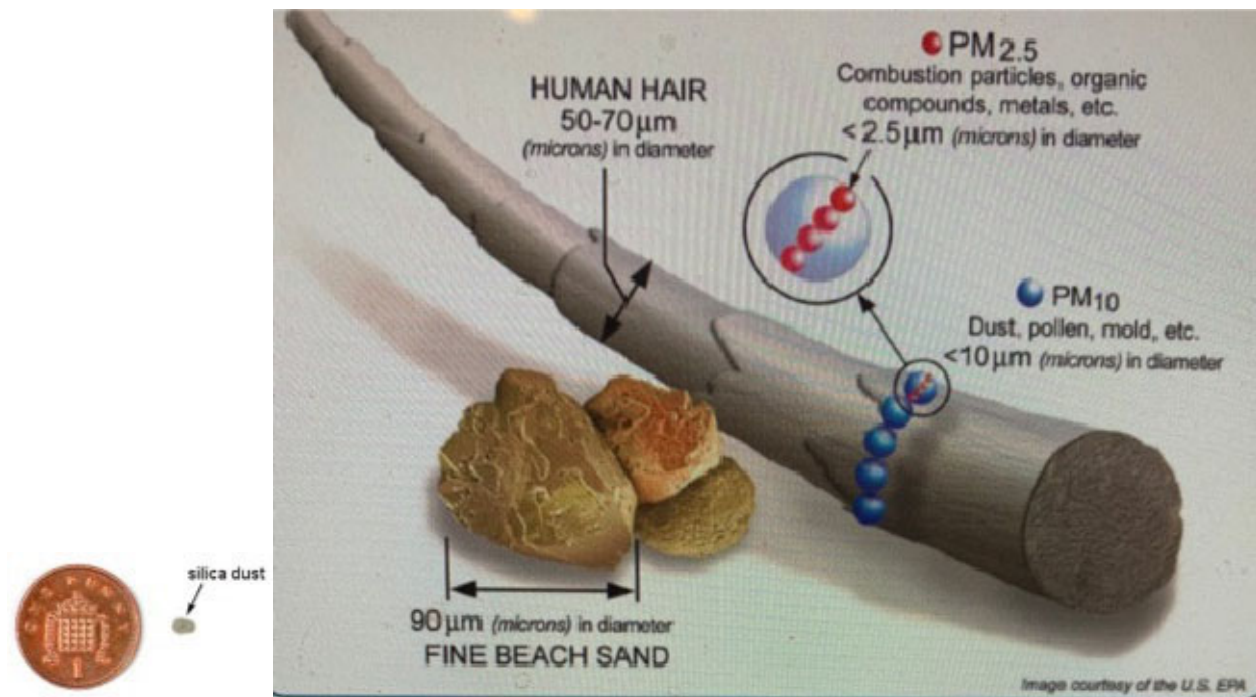
By itself, silica dust is not toxic. The health risk arises when silica particles are small enough to get into the deepest parts of the lungs, especially the alveoli where inhaled air passes into the bloodstream. Chronic or long-term exposure to fine silica particles can lead to lung inflammation and produce a severe lung disease known as silicosis. This has prompted government and international health agencies to declare silica to be a human carcinogen (IARC, 2012; NTP, 2011; Steenland, 2014).

The recommended World Health Organisation exposure limit for PM₁₀ silica particles is around 50 µg/m³ over a 24 hour period.

The Health and Safety Executive (HSE) 24 hour exposure limit to avoid adverse health effects is around 0.1 mg/m³ or 100 µg/m³. HSE have provided a graphic visual illustration of this tiny amount, as shown below.

To put the 10 µm (PM₁₀) and 2.5 µm (PM_{2.5}) particles into perspective, the diameter of a human hair is around 50-70 µm and fine beach sand has a typical diameter of around 90 µm. Talcum powder has a mean particle diameter of around 15 µm and pollen grains have a diameter of around 10 µm (see blue balls below) and PM_{2.5} particles have a diameter of 2.5 µm as shown by the very tiny red dots superimposed onto the blue pollen balls below. These PM_{2.5} and PM₁₀ particles are so fine that they make fine beach sand look like boulders. The PM₁₀ particles are invisible to the naked eye and are highly dangerous as they dry out quickly and are blown about even in light winds and

absorbed by the lining of the lungs if breathed in.



Buffer Zones

All quarries that either extract sand or rock are now required to have an appropriate buffer zone to protect local residents from the carcinogenic dust. Buffer zone protection works by giving sufficient distance for coarse sand particles to settle out within the buffer zone and for fine sand particles to be sufficiently diluted by the air volume within the buffer zone so as not to cause a serious health hazard.

The buffer zone for sand quarries is typically set at around 100m but it is increased to 250 to 500m for hard rock quarries as the blasting creates very fine dust which travels much further than coarser sand particles.

The results from a study of airborne respirable silica near a sand and gravel facility in central California (Environ Sci Technol., December 2002 by Shiraki & Holmen) confirm the absolute need for appropriate buffer zones. The California study showed that PM10 levels were above World Health Organisation 24 hour exposure limits of 50 µg/m³ at distances of 22m (60.6 µg/m³) and 62.4 µg/m³ at 62m.

In the UK, although some planning authorities prefer to treat planning applications on a case by case basis rather than being too prescriptive, the best practice exclusion zones are adopted by various planning authorities to keep noise and dust levels to within statutory limits.

This best practice is underpinned by the Department of the Environment and the Institute of Air Quality Management.

The Department of the Environment Planning Guide, Section 5.3 states that:

“Residents living in proximity to quarries can potentially be affected by dust up to 0.5km from the source, although continual or severe concerns about dust are most likely to be experienced within about 100m of the dust source. The main potential impacts of dust are visual impacts, coating/soiling of property (including housing, washing and cars), coating of vegetation, contamination of soils, water pollution, change in plant species composition, loss of sensitive plant species, increased inputs of mineral nutrients and altered pH balances. Respirable particles, i.e. those less than 10 micrometres (10µm) in diameter, have the potential to cause effects on human health, depending on exposure levels”.

In relation to quarry dust, the Department of Environment issued a detailed technical report on buffer zones in 1995 which stated:

“The DoE study concluded that severe or persistent concerns about dust are most likely to be experienced near to significant dust sources (generally within 100m). In

practice, standoff distances are often incorporated into local planning policy, with m distances of 250-500 metres typically adopted”

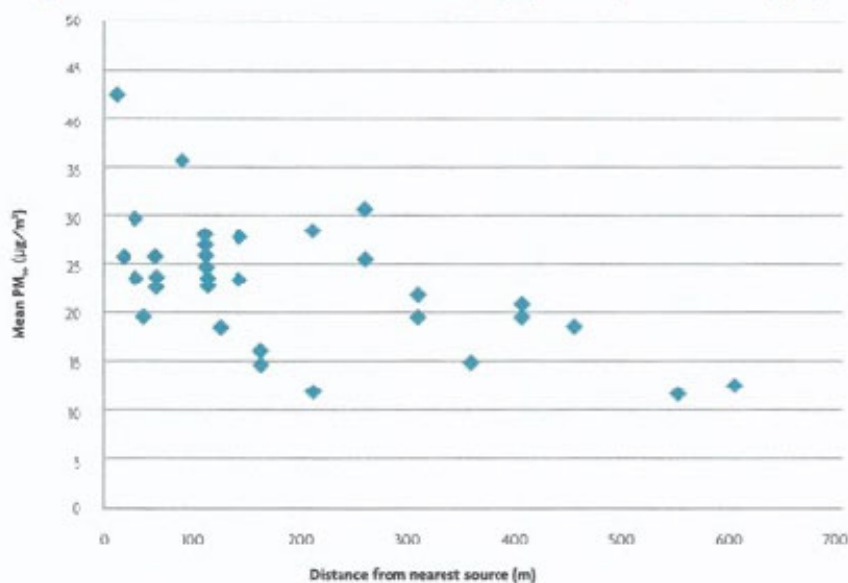
The IAQM guidance for Mineral Dust also considers the effects of 10µm particles (PM10) as a function of distance from quarry operations as shown below:

The graph shows that PM10 levels only reduce to consistent low levels at distances greater than 300-400m.

The IAQM guidance for Mineral Dust (Box 2. Typical Impacts with Distance From the Experience of the Working Group):

“Adverse dust impacts from sand and gravel sites are uncommon beyond 250m and beyond 400m from hard rock quarries measured from the nearest dust generating activities (see Appendix 2). In the absence of other information it is commonly accepted that the greatest impacts will be within 100m of a source and this can include both large (>30 µm) and small dust particles. The greatest potential for high rates of dust deposition and elevated PM10 concentrations occurs within this distance. Intermediate-sized particles (10 to 30 µm) may travel up to 400 m, with occasional elevated levels of dust deposition and PM10 possible. Particles less than 10µm have the potential to persist beyond 400m but with minimal significance due to dispersion”

Table A2-3
Mean PM₁₀ Concentration as a Function of Distance from Quarry Operations (Various Mineral Types)



Air quality has long been talked about as an issue. The Clean Air Act 1956 addressed the evident shocking risks to human health at that time. The threats were clear for all to see—or not, given the smog of the first part of that century. We should now be alive to the hidden threats of invisible particulates and noxious gases.

As mentioned earlier, In April last year, a coroner concluded that the tragic death of nine-year-old Ella Adoo-Kissi-Debrah was triggered by poor air quality in her community due to vehicle emissions. She had endured 28 visits to hospital because of breathing problems. Following the case, the coroner wrote a prevention of future deaths report that urged the Government to introduce legally binding limits as regards air quality based on World Health

Organisation guidelines. That case alarmed the public and should certainly have caused alarm among the Government. While PM10 and PM2.5 are now part of our lexicon in addressing air-quality issues, there are wider issues that urgently need legislation.

The science is extremely concerning and there is much research on the issue. On air toxicity, the Environmental Working Group, a US-based body specialising in research and advocacy, has stated that

“none of the air quality standards for silica are adequate to protect people living or working near sand mining sites. The danger of airborne silica is especially acute for children...Silica air pollution has become a danger for residents near open sand mining and processing. Children, older adults and others with existing disease are especially at risk.”

As a result, the group had concerns for any resident living within 1,500 metres of any excavation site, because of the dissipation of dust particles. According to its evidence, gathered in open sandmines in Wisconsin and Minnesota, the silica levels were at least 10 times higher than the recommended limit of 3 micrograms per cubic metre. I can see no reason why that would be much different from levels found in areas that border sand and gravel quarries in the UK.

HAZARD IDENTIFICATION

All of the above information has emphasised the risk of personal contact with silica dust and obviously you will no doubt be aware of much of the above evidence and its application to planning where quarries are concerned.

Much of the precautionary guidance applies to working quarries where the nature of the industry of itself will create the potentially toxic environment.

It may be argued that Moneystone is no longer a working quarry and that the proposed physical development of the site, should it be permitted, will only cause a temporary phase of disturbance during which quantities of silica dust be released into air in the immediate environment.

However attention has not been drawn to the permanent risk of airborne pollution continuing **after** the building phase of development has finished.

This has not been acknowledged or identified in any of the environmental statements surrounding the applications, yet by its innate geological characteristics and its enclosed terrain and topography at Moneystone Quarry, the permanence of risk from the inhalation of silica dust remains and the longevity of the problem has been completely overlooked.

The proposal is to house people directly inside the quarry where the dust hazard will be at its most intense. There is no buffer zone or protective distancing from the housing. The lodges are to be embedded in the quarry itself. They cannot be any closer to the source of the danger from silica dust emissions.

The friability of exposed weathered surfaces within that enclosed environment will cause cumulative concentrations of airborne silica dust to be permanently contained or captured thereafter, for however long that the frequency, movement and distribution of people using the quarry will contribute to its circulation.

Any one, indeed everyone, housed in that quarry for whatever period of time they stay, or in the case of employees, are at work, will be at risk of inhaling dust particles released during the normal activities planned at the site.

You will recall from earlier that any dust which is made up of silicate materials is as hazardous in the same way as asbestos fibres are, and thus as a respirable dust which is just as lethal, if not more lethal, in comparison to asbestos dust, it has to be considered in the same dangerous category as far as the public is concerned.

Exposure to particles of any sort for any duration has to be a cause for alarm. It only takes a very small amount of airborne silica dust to create a health hazard.

The body of scientific and medical evidence for the dangers of such interaction between people and that potentially hazardous environment is overwhelming.

However, no account of that risk factor has been taken into consideration at any stage in the documentary submissions in support of the applications at Moneystone regarding the long term effect of exposure of human health arising from the siting of the housing and facilities directly in the midst of this open silica sand quarry.

Bare rock faces are exposed in every direction and everywhere inside the quarries you will see that even after 15 years of neglect, no vegetation amply clothes the site. There is no way that with its steep sides subsoils can form easily to hide the exposures. The planned forms of the landscaping even after construction will continue leave large areas of steeply inclined and in many areas almost sheer exposed silica sand faces at risk of weathering and erosion, all of which will dissipate into fine dust next to which the lodges will be sited.

Like so much of the outdated planning for this project, this wanton neglect cannot be ignored and should be addressed before further time effort and expense are wasted on what is in reality a white elephant.

This is an ill conceived concept; a plan to house people in a sand pit full of deep water and dodgy stability is bad enough. To do so in a sand pit that has an internationally recognised potential for airborne toxicity of a lethal and life endangering quality to the numbers of people who will be tightly enclosed within it, seems even more reckless and foolish.

This is a crucial factor that has to be accounted for in determining the future of this site.

I should be grateful therefore if you would investigate the evidence provided here yourself, if you are not already aware of the dangers. An ignorance of the consequences or risks attached to contemplating such a scheme as is being proposed, appears prevalent when the current documentation surrounding it is scrutinised.

After all, you will be well aware that the NPPF requires sustainable development that includes under 8 b) a social objective to support strong, vibrant and healthy communities ensuring safe and healthy living conditions and in particular 174 e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Also under the section that covers ground conditions and pollution, it states that planning decisions should ensure that a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, (quarrying likewise) and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation).

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.

Site investigation information should include a risk assessment of land potentially affected by contamination, or ground stability and slope stability reports, as appropriate. All investigations of land potentially affected by contamination should be carried out in accordance with established procedures (such as BS10175 Investigation of Potentially Contaminated Sites – Code of Practice).

As far as I am aware these requirements have not been fully met both by the applicants in their documentation, or investigated by yourself as the case officer as given the seriousness of the risk to public health, you would have rejected the application by now.

Please acknowledge receipt of this objection and add it to the others on the appropriate web pages for **SMD/2019/0646 and SMD/2022/0014.**

Yours sincerely
David Walters
Secretary
Churnet Valley Conservation Society
CVCS

Do you really need to print out this Email? Be green - keep it on the screen.

This email is intended for the addressee(s) only and may contain sensitive, privileged or confidential information that could be protectively marked. If you are not the addressee please do not use the information in any way. If you have received this email in error please notify the sender immediately and delete it from your system. Thank you.

The Council may be required to disclose this email or any responses to it under the Freedom of Information Act 2000. The way in which we handle personal information is set out in our privacy notice and is available at <https://www.staffsmoorlands.gov.uk/YourData>
