Tom Childs
SANGs Officer
Guildford Borough Council

FAO: Jo Trask (Planning and Regeneration)

Dear Jo,

Reference: 19/P/00634
Location: East Horsley
Proposal: Land rear of Chicane and Quintons, Ockham Road North, East Horsley

Outline application for the demolition of two dwellings and alteration to access to allow for outline consent with all matters reserved (except for means of access from Oakham Road North not to include internal roads) for up to 110 dwellings and up to 300sqm of offices floor space (Use Class B1a) (0.01ha), open space, sustainable urban drainage system and associated landscaping, infrastructure and earthwork's at Lollesworth Fields, Ockham Road North, East Horsley.

Comment from Guildford Borough Council SANGs Officer

The proposed development is adjacent to Ancient Semi-Natural Woodland forming part of Lollesworth Wood Site of Nature Conservation Importance dominated by oak.

OBJECTION:

- the current proposal may result in new occupants being exposed to an unacceptable risk from air pollution
- further information is required from the applicant on how this issue can be resolved
- recommendation on the basis of the current proposal and information available that the buffer between the Ancient Semi-Natural Woodland and the development is inadequate and should be increased to 100m.

My comments are based specifically on the impact and relationship of Oak Processionary Moth within the Ancient Woodland on the proposed development. The comments do not include an assessment of the possible loss of foraging areas used by species associated with the Ancient Woodland, any other impacts on the Ancient Woodland or any proposed mitigation enhancements.

Ancient Woodland

Natural England's and the Forestry Commission 'Standing Advice' on protecting Ancient Woodland and veteran trees from development is a material planning consideration in planning applications.

The standing advice states that *'for ancient woodlands, you should have a buffer zone of at least 15 metres to avoid root damage. Where assessment shows other impacts are likely to extend beyond this distance, you're likely to need a larger buffer zone'.*

Additionally NPPF 175.c states: *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused*

The adjacent ASNW provides additional benefits of importance to the proposed development: it is identified in the Landscape and Visual Appraisal as a strong screening feature between the development and surrounding countryside in the Green Belt. It provides physical and visual containment of the site and supports the site's release from the Green Belt in Guildford Borough Council's adopted Local Plan (2019).

The proposed development will meet the minimum requirements of standing advice for a buffer of at least 15m between the development and the ASNW.

However the statutory advice allows for further assessment of other relevant impacts. This assessment shows other impacts are likely to extend beyond the minimum distance of at least 15m and therefore a significantly greater buffer between the development and ASNW is needed.

Oak Processionary Moth

The oak processionary moth (Thaumetopoea processionea; OPM) is a pest which has established itself in oak trees in the north of our borough in recent years after being accidentally introduced from mainland Europe. As such impacts have not been considered in previous reviews of effects on ASNW such as *Impacts of nearby development on ancient woodland* – Ryan (The Woodland Trust 2012). This brief assessment may in fact be the first instance of OPM being appraised in relation to a proposed new development and its proximity to oak dominated ancient woodland.

The proposed development is situated within the Forestry Commission's OPM Control Zone. Numerous OPM nests have been recorded within close proximity to the site and the adjacent Lollesworth Wood and these infested sites are currently included in the Forestry Commission's 2019 OPM Control Programme as 'Spray Sites'.

An OPM survey has not been provided for Lollesworth Wood with the application. Given its proximity to multiple infested sites within the OPM Control Zone it would seem highly likely that some of the woodland and trees are either already infested/ or if OPM is not already present in Lollesworth Wood then inevitably it will become infested in the very near future. It is also possible that to a minor extent the proposed development itself may encourage infestation as the female moth is known to be attracted to light and warmth around developed areas.

Health impact risk for new residents

Health impacts from OPM have been reviewed by Public Health England in their reports:

Health effects associated with exposure to oak processionary moth larvae: a systemic review – Summary of findings. (2015)

Each OPM caterpillar can release over 600,000 setae (tiny hairs) which contain an irritating substance called thaumetopoein. This substance can cause itching skin rashes, eye irritations and breathing difficulties in people and animals. Additional research is required into the long-term health impacts of OPM exposure however when individuals have been in regular contact with the setae of processionary caterpillars hyper-sensitization has resulted.

As a relatively new occurrence, OPM is not included in Natural England and the Forestry Commission's Assessment Guide: Helping to assess the impact of planning development proposals on ancient woodland and veteran trees. However Point 7 of the assessment guide states *Does the development have the potential to affect the woodland through changes to air quality or to ground water (through pollutants or changes in hydrology)?* It may be considered that this impact could apply to treatment for OPM such as spraying which may result in harm to wildlife associated with the ASNW and as it percolates downwards contamination of ASNW soils. Within a risk based approach such spraying might not otherwise necessarily need to occur once the site is within the Core OPM Zone if it were not for the proximity of the proposed new development.

New occupants will potentially be exposed to an unacceptable risk from air pollution

The proposal provides an Air Quality Assessment however despite the proximity of oak woodland to the development this does not mention the potential health impact of OPM on the occupants of new dwellings within their homes and gardens.

NPPF 15. 170. States ' Conserving and enhancing the natural environment': *Planning policies and decisions should contribute to and enhance the natural and local environment by:*

170 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….

There are numerous references to health impacts caused by OPM on local authority websites, Forestry Commission literature, academic journals and in the press. The proximity of the proposed development means that it may be adversely affected by unacceptable levels of air pollution caused by OPM.

The NPPF is not prescriptive on the methodology for assessing air quality effects and does not define what is meant by 'air pollution'. It would however seem obvious that air pollution applies to airborne substances with health impacts. Clearly airborne OPM setae can have negative consequences for health and amenity. It is therefore concluded that airborne OPM setae should be considered as a form of air pollution and contamination from OPM setae would by default apply to this statement in the NPPF. In its current form the occupants of the proposed development may therefore:

- be put at an unacceptable risk from air pollution from OPM and
- the proposed development may be adversely affected by air pollution from OPM in other ways such as loss of amenity and nuisance.

Assessments should be proportionate and specific to the location. If warranted it is also appropriate to include expected future air quality impacts.

Many of the acute reactions to OPM setae are a result of thaumetopoein and I consider these issues alone are great enough in themselves to equate airborne OPM setae to being a form of air pollution.

Further potential but unassessed impacts

However it is also proposed that the size and nature of the particles means that they cannot currently be ruled out as a potential cause of further air pollution impacts.

The harmful effects of dust are frequently linked to particle size and shape. For example PM10 particles are an issue because they remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health. No statutory or official numerical air quality criterion for dust annoyance has been set so consequently dust assessments tend to be risk based and commensurate with the risk to be identified on the basis of professional judgement.

For receptors similar in number to the proposed development 19/P/00634 the IAQM Guidance on the assessment of dust from demolition and construction sets out a distance of 350m from the site boundary. Within a lesser distance it is agreed that there is potential nuisance and effects on human receptors. And for this very reason such guidance is followed in the proposal for the demolition of existing buildings.

The ASNW lies to the west of the development extending north and south co-terminus to the southwest and northwest of the proposed development. The proposed buffer between the woodland and the nearest homes and gardens in the proposed development is just 15m. This is the minimum distance specified in guidance between a development and Ancient Woodland. Such a small distance is well within range of airborne contamination from setae a major cause of health impacts*.

**The oak processionary caterpillar as the cause of an epidemic airborne disease survey and analysis: Maier, Spiegel, Kinaciyan, Krehan, Cabaj, Schopf, Honigsmann (2003)*

The prevailing wind in summer in the south of England when outbreaks of OPM reach their peak is southwesterly. The direction of the prevailing wind increases the likelihood and severity of airborne pollution impacting on the proposed development. It is therefore likely that a high percentage of any airborne setae shed during this period will be carried by the wind towards homes, gardens and open spaces within the proposed development. Health impacts occur when airborne OPM setae make direct contact with people and pets but indirect vectors such as drying laundry also bring setae into contact with humans.

Similarly, as the harmful effects of thaumetopoein on the setae can endure they may also accumulate in areas. It is feasible that they may accumulate on building surfaces, garden items such as benches or trampolines and shrubs and long grass. Such accumulations of setae may only be felt at such a time in the future when grass is mown or surfaces disturbed.

Morphological risk

Acute reactions to setae are caused by exposure to thaumetopoein. However as setae consist of chitin they possess a degree of bio-persistence within the lungs and human body tissues. For example setae have been removed from an eye a decade after exposure. Whilst not suggesting that setae have similar levels of bio-persistence to asbestos or concluding they bear any such confirmed risk of carcinoma it is clinically inappropriate to disregard the intrinsic toxicity of any needle-shaped small particle. As such a cautious approach is recommended on the basis that other potentially harmful effects should perhaps not be ruled out without further research.

The health impacts of OPM setae therefore have potential to extend beyond reviewed reactions to thaumetopoein. Physical interaction with cell molecules and DNA is one of the mechanisms of asbestos pathology and an inherent property of any similarly sized fibre. The World Health Organisation has defined respirability for asbestos as fibres having a diameter of ≤ 3μm and length ≥ 5μm dimensions that correspond to OPM setae.

The perception of natural fibres presenting little health risk is considered to be due to natural fibre sizes typically being above 10 μm diameter and therefore unable to readily penetrate into the pulmonary regions of the lung.

An inventory of fibres to classify their potential hazard and risk (HSE 2006)

Like asbestos and other problematic particulates OPM setae are below 10 μm diameter (3-7 μm). Small, narrow particles although inhaled deeply are particularly difficult for macrophages to expel increasing the risk of skin penetration. It is these finer diameter respirable fibres that are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Additionally if setae particles penetrate the skin membranes (such as via entry through the gut from ingested or particles cleared in mucus and swallowed) the hollow nature of the setae can act as a vector for bacteria. Just a few setae passing through soft tissues into the uterus and foetus have been linked to miscarriage in grazing animals. Research on human miscarriage has shown a link between higher levels of ambient, particulate matter air pollution and pregnancy loss.

Ambient air pollution and the risk of pregnancy loss: a prospective cohort study (Ha, Sundaram, Buck Louis, Nobles, Seeni, Sherman, Mendola: 2018)

The depth to which particles are inhaled relates to their morphology and narrowest diameter. The size and needle-shaped morphology of OPM setae provides a biologically optimised risk of deep inhalation. The diameter of OPM setae vary between 3 to 7 μm and setae or their barbs may also sheer resulting in more numerous and smaller or narrower particles. But although its morphology is so similar to asbestos and other harmful fibres no such research has taken place on any long term health effects. To repeat my earlier statement this comment is not intended to proportion any such risk as that of asbestos but to advocate a cautious approach and to raise relevant concerns in the hope that they can be reasonably and pragmatically addressed to the benefit of the proposed development and future occupants.

The number and dosage of an airborne particulate increases the risk of serious health impacts. In the case of OPM setae numbers would very much depend on the level of infestation. I realise that few people will have the combined knowledge of air pollution and OPM to make such an assessment. I

have just a basic knowledge of air pollution but in reference to OPM in a major outbreak thousands of caterpillars can be present on a single tree. (E.g. 30 nests of 200 caterpillars). We also know that each individual caterpillar can possess 610,000 setae. (60,000 per mm^2) As setae may also sheer and break this can further increase the number of particles. OPM caterpillars also shed their skins into nests on the side of trees which may break down over time resulting in the risk of cumulative and persistent airborne setae throughout the year from unmanaged OPM nests. A high number of trees within the adjacent ASNW are oak and could therefore be affected and upwind of the proposed development.

To illustrate this point:

50 trees x 610,000 setae x 30 nests x 200 caterpillars = 183,000,000,000 setae (183 billion).

OPM caterpillars shed their skin not once but several times during their lifetime as they pass through different instar stages. Although earlier instars have fewer setae the moulted skins magnify the overall figure. Similarly, there is a possibility of accumulations of setae shed in the previous years and the fact that 50 trees is a modest estimate to use within this woodland as during an outbreak year. In reality, all oak trees may be affected in an outbreak year and some other species may also be affected if there is insufficient oak.

On this basis there are concerns that airborne OPM setae may result in harmful and persistent air pollution affecting the proposed development.

Research shows that an OPM seta can travel extensive distances in low winds* and it is therefore naïve with any knowledge of dust impacts to solely consider that health impacts will only occur as a result of direct contact with a caterpillar or be limited to immediately below the canopy of an infected tree.

**Dispersion of the bio-aerosol produced by the oak processionary moth: Fenk et al (2007)*

These potential dispersal distances of OPM setae require consideration in the selection and design of development sites. The purpose of this comment is to highlight concerns and take the first steps to appropriately assess and resolve these issues. It is hoped that the information will help to provide a suitable safe and practicable solution for occupants of new development in proximity to oak woodland to deliver the best outcomes for both.

In order to explore a way forwards we need to find a way to provide a satisfactory solution for the new development and the future occupants that is pragmatic and achievable. Some comparison with vehicle particulate range would seem an appropriate consideration in relation to dispersal models for OPM setae. The information from vehicle emissions which includes similar sized particulates to OPM relates to distances within which a receptor is subject to higher exposure. 200m is commonly used for car pollution for similar sized particulates with most effects shown to occur within 50m. As a minimum 50m is therefore a sensible initial distance to consider for a buffer. But given the height of the trees on which the OPM will be present (i.e. higher than a road) studies into dispersal of setae show the added height increases dispersal distances. Smaller numbers of setae could also have an effect on an individual than vehicle emission particulates. Therefore it is reasonable to suggest that a slightly greater range of 100m should be provided as a safety buffer for most effects and to protect the new occupants of the homes from harm.

Conclusion

It is not known if the development would have any access or control over the adjacent ancient woodland to carry out OPM control. However control methods for OPM are currently costly and would provide a heavy ongoing burden on the occupants of the new homes if included within service charges or similar or made a condition for the development. However if the buffer was just 15m then failure to address the problem may affect the health and welfare of the occupants and their enjoyment of amenity and their homes.

Treatment methods for OPM may also be harmful to the Ancient Woodland. They may reduce non-target insect numbers and subsequently woodland birds that feed on them. Additionally the combination of a high cost to treat oaks in the ASNW for OPM and a high nuisance to occupants and the potential to reduce property values, may place oak trees within the ASNW at increased risk of felling at least similar to that if they were casting shade on new homes.

Having provided this initial assessment on the risk of air pollution from OPM to new development, I consider that the effects of thaumetopoein on human health and enjoyment of amenity alone are serious enough to amount to air pollution in regard to the NPPF. The recommendation is therefore relevant and appropriate. Additionally I consider that it would be inappropriate to rule out further complex and serious health impacts due to the needle-shaped morphology and dimensions of the fibres and have summarised some initial concerns in that respect.

My comment is made on the basis of my combined knowledge of Ancient Woodland and involvement in current research into Oak Processionary Moth. It is suggested that further information on how this issue can be resolved is provided by the application. However based on the information available, I strongly recommend that to minimise and reduce risk to occupants of the proposed development a buffer of a minimum 50m-100m is provided between the proposed development and the Ancient Woodland.