



**Position Statement on the impact of
HS2 on the Chilterns' chalk aquifer and
its chalk streams**

**Buckinghamshire Council and Chilterns
Conservation Board**

Date: 05/05/2021

Buckinghamshire Council and the Chilterns Conservation Board have serious concerns about the impacts of HS2's tunnelling operations on Buckinghamshire's aquifer and chalk streams.

Background

Only 200 chalk streams are known globally, 85% of which are found in the UK in southern and eastern England. Nine of these iconic rivers are located in the Chilterns and are one of the reasons for the Chilterns being designated an Area of Outstanding Natural Beauty.

Our chalk streams emerge from the chalk aquifer, so the very pure water is rich in minerals and remains at a fairly constant temperature year-round. In Buckinghamshire these include the well-known south running streams such as the Misbourne, Bulbourne and Chess which drop into the Thames, as well as the lesser known streams emerging at the foot of the escarpment flowing north, for example Wendover Brook.

Key species are associated with chalk streams, many of which have conservation status in their own right due to the level of threat they are under, such as Bullhead, Brown Trout, Water Crowfoot, Otter and Water Vole.

Chalk streams are also a Priority Habitat and have been identified as being one of the most threatened habitats and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). Latterly the former UK BAP was succeeded by the UK Post-2010 Biodiversity Framework (2012).

Concerns regarding the impacts of tunnelling on the chalk aquifer and chalk streams are not new, but remain unresolved. For example, concerns were raised by Buckinghamshire Council, the Chilterns Conservation Board and others at the petitioning stage as the HS2 Act passed through Parliament.

While several safeguards were introduced in the final Act, these largely comprise protective provisions for the water companies. In addition, measures are set out in the Code of Construction Practice and the Chiltern/Wycombe Local Environmental Management Plan, but these are effectively just a plan, monitor and react position.

We are therefore seeking answers to the questions and concerns below. This has become particularly urgent given that HS2 Ltd is expected to apply any time now to the Environment Agency for consent to begin tunnelling operations.

Furthermore, the Judges' decision in the recent tribunal *Green vs High Speed Two (HS2) Ltd* (4 March 2021), makes clear that the impact of tunnelling and drilling on the chalk aquifer is of huge public interest and the public should be given access to the data and should be consulted. We are also therefore seeking full disclosure and a public consultation.

Concerns

Buckinghamshire Council and the Chilterns Conservation Board have a number of key concerns and questions that remain unanswered relating to HS2's tunnelling operations.

These include:

1. Pollution - how will HS2 Ltd mitigate against polluting the Chilterns' chalk aquifer and its chalk streams by its tunnelling operations and railway construction?

Contamination of the aquifer and chalk streams by pollutants is likely, either directly from the tunnelling process or afterwards where unclean waters enter chalk streams from drains, new road layouts, track beds, and viaducts etc.

Tunnelling by the two Tunnel Boring Machines (TBMs) grinding through the chalk, will create a liquid slurry to be pumped back through the tunnel. However, we are concerned that pollutants and sediment will be carried through the aquifer, impacting on both our chalk streams and on water abstracted for drinking water.

Potential pollutants include: substances such as oils and greases, which affect invertebrates' and fishes' ability to breathe; salt, which is toxic at low densities to many key species; litter; and fine sediments, which can cause de-oxygenation of water and swamp clean gravels leading to losses of fish, key plant species and invertebrates.

These effects will be further compounded by loss of natural water by infiltrating surfaces, such as through the construction of hard standings, road and engineering structures, car parks, ground stabilisation membranes, and the potential adding of non chalk stream waters into chalk streams through new drainage channels, ditches and culverts.

2. Abstraction - will HS2 Ltd's tunnelling operations result in increasing levels of water abstraction from the Chilterns' chalk streams and, if so, what measures are being taken to protect the Chilterns' chalk streams and drinking water supplies?

Of particular concern, is the huge volume of water required for tunnelling. While precise volumes have still not been fully determined, latest figures estimate that the Tunnel Boring Machines will require up to 10 million litres of water a day. Although some water will be recycled, this is the equivalent of four days water supply for the whole of the population of Amersham. It is still unclear how much water will be required - the average daily rate and also expected maximum rates - where the water required will come from. We also want to know how the contaminated waste water will be processed and disposed of.

A great deal of campaigning in recent years has resulted in a reduction to the levels of water abstraction that have been damaging our chalk streams. We are now extremely concerned at the prospect of HS2 Ltd's water requirements reversing these reductions and decreasing water flow in our chalk streams. This could have a devastating impact on our precious chalk streams and potentially impact on the availability of drinking water.

3. Impact on river flow – what assessments have been made of the risk of HS2 Ltd's tunnelling operations impacting on groundwater flow?

The geology of the chalk the Tunnel Boring Machines will be boring through is known to be deeply fractured. The capacity to cause major disruption to flows within the aquifer and to surrounding water bodies is therefore significant.

We have not seen any evidence to indicate that HS2 Ltd has sufficient information on the very complex geology to accurately model the tunnelling's impact and develop mitigation plans. The potential impacts on groundwater therefore remain unclear. Both the Rivers Chess and Misbourne are already on a knife edge in terms of flow rates.

4. Impact on the River Misbourne - has HS2 Ltd accurately modelled the impact of tunnelling operations on the flow of the River Misbourne?

Not only is the chalk bedrock fractured, but the River Misbourne is “perched” – the river-bed is above the water table - and so is particularly fragile. As the TBMs tunnel a mere 20m beneath the river at Chalfont St. Giles and Shardeloes Lake below Little Missenden, disturbance to the riverbed may cause water to drain away, leading to permanent damage to this rare chalk stream habitat and loss of wildlife.

It is our view that HS2 Ltd's mitigation plan for the River Misbourne - in the event of damage – is totally inadequate. The ‘plan’ appears to simply focus on monitoring and developing a mitigation plan to deal with the damage once it happens. This is likely to be too little, too late.

The loss of a chalk stream and the rich diversity of wildlife that it supports does not align with HS2 Ltd's commitment to causing ‘no net loss’ of biodiversity.

5. Impact on Weston Turville Reservoir - what plans are in place to mitigate for the loss of water in the Wendover area?

In addition to the issues raised by the main tunnelling process, we are concerned that the ‘cut and fill’ tunnel further north - through the side of Bacombe Hill, south of Wendover - may intercept and divert water from springs that feed the Wendover Arm of the Grand Union Canal (GUC) and the Weston Turville Reservoir Site of Special Scientific Interest (SSSI). The Wendover Arm of the GUC supplies water to irrigate the main GUC. If additional water is required from elsewhere to maintain levels in the canal, this could result in increased water abstraction in the Bulbourne valley with detrimental impacts to the River Bulbourne, a chalk stream which is already suffering from the effects of over-abstraction.

6. Longer term damage - does HS2 accept that longer lasting damage is likely to be caused by the tunnelling operations and will it accept responsibility for such damage?

Potential long term damage includes:

Changes to water temperature – a key characteristic of chalk streams is their stable water temperature. Water added to chalk stream systems that changes the temperature of the water - even if only by a degree or two - has a significant effect on the ability of the water to hold dissolved oxygen. This can have negative consequences for invertebrates which form the base of the food chain as well as the fish, birds and mammals which feed on them.

Introduction of non-locally native and invasive species – this is likely either by accidental deposition from plant and machinery, or from landscaping works where species are introduced which might be “native” but not locally so. Or, as is often the case, they can be accidentally introduced through tree and aquatic plants from nurseries.

7. Monitoring – what measures are being put in place to monitor tunnelling operations and to mitigate negative impacts if they occur?

Given the significant public interest in HS2 Ltd's operations and concerns regarding the chalk aquifer, we believe that monitoring of the tunnelling operations and its impacts needs to be carried out independently of HS2 Ltd.

8. Environmental standards - what measures are in place to ensure that the tunnelling operations cause no net loss of biodiversity and uphold the highest environmental standards, as set out in the Environmental Statement?

HS2 committed to no net loss of biodiversity in their Environmental Statement. We would like to know what measures HS2 are putting in place to ensure tunnelling operations do not result in a net loss of biodiversity, bearing in mind all the concerns raised above.

In conclusion, we are urgently seeking answers to the above questions before tunnelling operations commence, to ensure that we and Buckinghamshire's residents are fully informed of the likely impacts, and HS2 has plans in place to mitigate impacts.

Notes for Editors:

- Since HS2 was approved by the Government in 2010, Buckinghamshire Council and The Chilterns Conservation Board argued that the route should not pass right through the middle of the protected landscape of the Chilterns AONB. Over the past eleven years they have worked together along with the HS2 Review Group and other partners to secure the best possible outcome for the environment despite the Government's decision to proceed with the project.
- Both the Council and Chilterns Conservation Board have limited powers, with no formal role in decision making, and are therefore unable to stop the High Speed 2 Railway Project from progressing, however they do uphold their right to question, challenge and call out HS2 Ltd and its contractors when they have concerns about impacts that could, and should, be avoided.
- Buckinghamshire Council cannot refuse work that has been permitted through the HS2 Act, however they can refuse the details of those works. A refusal of such works is called a Section 17 and a recent example of this was seen last week when the Council refused to approve lorry route applications from HS2 Ltd.
- [The Chilterns Conservation Board](#) is an independent public body set up following the passing of the Countryside and Rights of Way Act, 2000, to conserve and enhance the natural beauty and increase awareness and understanding of the Chilterns Area of Outstanding Natural Beauty (AONB). The Board, which also aims to foster the social and economic wellbeing of local communities, employs a staff team of 24 that works in partnership with local authorities, voluntary organisations, businesses, local communities and others who live and work in the Chilterns.
- The Chilterns Area of Outstanding Natural Beauty (AONB) was designated in 1965 and covers 833 sq kms (326 sq miles) stretching from Goring, in Oxfordshire, to near Hitchin, in Hertfordshire. A home and workplace for over 80,000 people, the Chilterns AONB is the third largest AONB in England and is designated as one of the finest landscapes in the country.

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