

Sir James Bevan
PO Box 544
Rotherham
S60 1BY
United Kingdom

28th April 2021

Dear Sir James

HS2 Request for Environmental Agency Permission to tunnel through the Chiltern Aquifer

We understand that HS2 Ltd have applied to the Environmental Agency for permission to tunnel through the chalk aquifer under the Misbourne Valley.

The Chiltern Society has serious reservations about the risks that would be taken with this activity. These reservations arise from the fractured nature of chalk as revealed both by HS2's ground investigations works and the latest British Geological Society survey, both of which have been reviewed by our Geological Advisor, Dr Haydon Bailey.

We have also reviewed a redacted version of HS2 Ltd's paper '[1MC05 Options for mitigation of the effects of shaft construction on groundwater](#)', which only looks at the potential impact of vent shaft construction on groundwater, and does not cover impact of tunnelling either on groundwater or the risks to the River Misbourne, a precious chalk stream.

These reviews give rise to the following questions:

- **Will HS2 tunnelling cause irreversible changes to groundwater flow?** Will the tunnelling process disrupt water flow patterns, including affecting water supply to-
 - the River Misbourne and other rare chalk streams such as the River Chess?
 - the drinking water abstraction sites along the Misbourne valley and the Colne?
- **Should we expect partial or total loss of flow in the River Misbourne?** Between Amersham and Chalfont St. Giles the River Misbourne is "perched" – the riverbed is above the water table - and is therefore particularly fragile. Will shallow tunnelling (at c.20m depth) beneath the river at Chalfont St. Giles cause disturbance to the riverbed and drainage of water from the river leading to permanent damage to this rare chalk stream habitat and loss of wildlife?
- **Will there be pollution to the aquifer?** The two TBM's will grind through the chalk creating a liquid slurry that will be pumped back through the tunnel. Will any turbid water flow be created within the adjacent aquifer and what impact will this have on water supplies and the health of our chalk streams? How will any resulting loss of potable water be mitigated?

- **Should we expect subsidence at Chalfont St Giles?** The ground between the bed of the Misbourne and the solid chalk aquifer at Chalfont St Giles comprises unstructured chalk rubble and gravel at least 16m deep. There is potential for the vibration of the TBMs to create subsidence across the path of the twin bore tunnel and for the water to be diverted away from the Misbourne. How will this be mitigated?
- **The reduction of abstraction to protect the Chilterns' chalk streams has been a long-fought battle. Will recent gains from water companies reducing abstraction be lost with HS2 demanding more water to carry out their tunnelling?** Of particular concern, is the huge volume of water required for tunnelling. Precise volumes have still not been fully determined, with latest estimates of the machines requiring up to 10 million litres of water a day. **Where will the water come from?** Although some water will be recycled, 10 million litres is the equivalent of four days water supply for the whole of the population of Amersham.
- **Once the tunnelling starts, it is unlikely to stop.** What contingency plans does HS2 have in place if it becomes apparent that the tunnelling is causing serious damage to the aquifer and/or to the River Misbourne?
- **Monitoring** the impacts of construction relies on data provided by HS2. This is akin to asking students to mark their own homework. **What measures will be in place to ensure effective monitoring of the entire tunnelling operation?** We are concerned that **mitigation plans are inadequate** –the mitigation 'plan' for the River Misbourne amounts to little more than monitoring for an impact and then exploring how to address the damage, after it has occurred. By this stage irreparable damage will have been caused.

We ask that in your considerations that you ensure that the above questions are satisfactorily answered before permission to proceed is granted. and that monitoring is independent of HS2 Ltd. A safer alternative would be to require HS2 to tunnel in the clay underlying the chalk aquifer.

Yours Sincerely

A handwritten signature in blue ink, reading "Simon Kearey", enclosed in a thin black rectangular border.

Simon Kearey

Chair - Chiltern Society

Campaigning for, Conserving and Promoting the Chilterns