HS2 Environmental Statement response by The Chiltern Society

February 2014

Introduction

The Chiltern Society is a registered charity with 6,800 members that works to promote, conserve and improve the unique character of the Chiltern Hills which stretch across parts of Oxfordshire, Buckinghamshire, Hertfordshire and Bedfordshire. This includes the Chilterns Area of Outstanding Natural Beauty (AONB).

The Society is not opposed to high speed rail in principle. It strongly objects to the proposed HS2 route crossing the AONB. It believes the route is neither justified nor proven and that alternative routes have not been properly considered.

However, if, by default, this route is selected by Parliament, the Society believes it is vital that the AONB should be fully protected by the construction of a tunnel under the entire Chilterns AONB.

General comments on the Environmental Statement (ES)

All of these points are expanded upon in other areas of the Society's response.

1. The ES pays no meaningful regard to the fact that the AONB is a nationally protected landscape that requires special consideration.

- It contravenes Section 85 of the Countryside and Rights of Way Act 2000 spelling out the duty of public bodies to conserve and enhance the natural beauty of the AONB.
- It dismisses the overall impact of HS2 on the AONB as of little significance without seemingly recognising that the Misbourne Valley, which will be directly affected, is at the centre of the AONB and at its widest part.
- It fails to recognise that design of infrastructure in an AONB should be of the highest standard, overseen by an independent design panel
- It fails to demonstrate an overriding public interest to justify crossing and damaging an AONB

2. The ES fails to evaluate a route that does not cross the Chilterns AONB. It has not considered the environmental or other advantages of constructing a tunnel under the entire AONB.

3. The ES has not considered the geology of the Chilterns in any detail. This is of particular concern because of the potential danger to water supplies and existing water courses.

4. The ES proposes dumping at least 12 million tonnes of spoil in the AONB, significantly changing the landform of a protected landscape. This completely undermines, either deliberately or through ignorance, the entire concept of protected landscapes in the UK.

5. The ES outlines a mitigation approach with a first priority to avoid adverse effects. This approach has been ignored in the Chilterns AONB.

- The combination of proposed permanent constructions such as ventilation shafts, balancing ponds, viaducts, catenary towers, noise barriers, security fences, new roads and new bridges will have a severe negative impact on the AONB.

- The disruption to nationally important public rights of way (PRoWs), such as the Ridgeway, the Icknield Way, the Chiltern Way and the network of PRoWs for which the Chilterns is famous is either ignored or treated with scant regard

6. The ES is poorly researched, hurriedly prepared and lacks transparency.

- No account has been taken in this final version of comments made by parties to the draft version.

- Too many "desk-top" exercises have been undertaken to assume likely impacts.

- Assessors failed to gain access to some areas to conduct studies.

- Ecology studies normally carried out over three years have been conducted in one year.

- The Landscape Character Areas (LCAs) used to describe the impact of the proposals on the landscape are different from long established LCAs used by other bodies, including local authorities.

- It fails to identify the rush hour period properly.

- Its traffic calculations are often wrong and highly improbable.

- It offers no safety or security recommendations.

- Contributors to the ES include companies such as Arup and Atkins who are likely to have a financial interest in any HS2 construction.

7. The ES states that all mitigation measures are proposals. There are no commitments.

- The Code of Construction Practice (CoCP) is only in draft form and is seriously flawed.

- The ES does not lay down any rules of accountability for the principal undertaker who will be responsible for the construction of the railway and the implementation of mitigation measures.

- The ES is full of vague and non-committal statements, indicating measures will be taken "where practicable" and "where reasonably practicable". This offers no reassurance whatsoever to a public concerned about the environmental impact of this proposal. To illustrate this there are 44 mentions of ‘reasonably practicable’ and 4

‘practicable’ in the CoCP. There are also approximately 20 mentions of ‘reasonably practicable’ and 4 ‘practicable’ in CFA 7, 8, 9 & 10.

- There are no detailed proposals for the maintenance and management of affected land once construction is completed.

8. The ES shows a lack of understanding of the Chilterns community in assessing the social and economic impacts.

- It fails to appreciate how its communities are inter-linked: how frequent journeys are made to other communities for education, health, leisure and social facilities.

- It does not consider the impact on tourism to the area.

- It fails to consider the impact on local business, especially during the lengthy construction period.

- It does not consider the impact on ambulances and other emergency services, especially during the construction period.

- It does not analyse the cumulative impact the proposals will have on the thousands of walkers, cyclists and horse riders the Chilterns attracts.

9. The ES downplays the historical, geological and woodland importance of the Chilterns AONB

- It fails to recognise the global importance of the area's chalk streams.

- It fails to refer to threatened species first recognised in the draft ES.

- It undervalues nationally important ancient woodland.

- It understates the amount of woodland and hedgerow loss, and incorrectly assesses that loss to be insignificant.

- It trivialises or ignores the area's archeological significance (a number of archeological sites will be destroyed by the HS2 project), the loss of ancient sunken lanes, the destruction of part of Grim's Ditch, a scheduled ancient monument, or the fact that 550 Grade 1 or Grade 2 listed buildings in the Misbourne Valley alone will be impacted to some degree by the project.

10. The ES misinterprets the environmental impacts - either by design or accident - partly because of a lack of local knowledge.

- It uses noise levels that are higher than the World Health Organisation guidelines.

- It fails to recognise the extent to which the tranquillity of the Chiltern valleys will be disturbed.

- It treats the loss of Best and Most Versatile (BMV) land as an incidental issue and fails to illustrate the total and cumulative impact on farmland.

- It pays no regard to potential water pollution or potential risk to water supply locally or to the London area.

Conclusion

Despite its enormous length and complexity the Environmental Statement is highly unsatisfactory if it is meant to answer people's questions about the environmental impact of HS2 and reduce their fears by proposing meaningful mitigation measures. It fails on all counts. It often reads like a marketing document rather than an independent examination.

Next steps

If the Government believes a new high speed rail network should be developed, it should:

1. Properly evaluate routes from London to the Midlands and the North that do not cross the Chilterns AONB - the only AONB to be directly affected by the HS2 project as currently proposed (including Phase 2 where AONBs have been avoided and major transport corridors like motorways or existing intercity railways have been followed.)

2. Properly evaluate the construction of a two bore or three bore tunnel under the entire length of the Chilterns AONB in order to fulfil its obligations under the Countryside and Rights of Way Act.

3. Develop a National Infrastructure Plan, including the rail network, once it has agreed the future development of Britain's airports, following the Davies Report.

4. Once 1 and 2 above have been completed, undergo a national consultation over the entire proposed high speed routes which would enable the public to properly consider alternative routes and comparative costings.

5. Ensure that any environmental impact assessment carried out for the national consultation is thoroughly researched by truly independent bodies which will not be influenced by any potential involvement in the eventual construction of the project.

The benefits of avoiding the AONB, whether by varying the route or by a fully bored tunnel:

- The loss of 11 hectares (ha) of ancient woodland would be avoided

- The loss of 188ha of farmland would be avoided

- The loss of other woodland would be avoided

- The loss of 38km of hedgerows would be avoided

- The loss or severe impact on PRoWs would be avoided
- There would be no cuttings, viaducts or embankments in the AONB
- There would be no balancing ponds in the AONB
- There would be no need for a spoil dump in the AONB
- There would be no loss of 16 properties and 30 outbuildings
- There would be no impact on Grim's Ditch
- There would be no impact on 550 Grade 1 and Grade 11 listed buildings
- There would be a greatly reduced impact on barn owls, bats, crested newts, and other wildlife
- There would be no disruption to animal migration trails
- There would be a greatly reduced traffic impact
- There would be a greatly reduced impact on schooling
- There would be a greatly reduced impact on the communties of Amersham, Beaconsfield, Great Missenden, Little Missenden, Little Kingshill, Prestwood, Hyde Heath, South Heath, Potter Row, Dunsmore and Wendover.
- There would be a greatly reduced impact on local business and tourism.

THE NON-TECHNICAL SUMMARY (NTS)

Fundamental points affecting the Environmental Assessment

Lack of regard to Chilterns AONB (Area of Outstanding Natural Beauty) considerations

AONBs are designated areas of high scenic quality that have statutory protection in order to conserve and enhance the natural beauty of their landscapes. Together with the National Parks, they represent the finest quality of English landscape requiring the highest status of landscape protection. The Chilterns Area of Outstanding Natural Beauty is the ONLY AONB crossed by the HS2 route within the whole of the proposed HS2 network (including Phase 2).

Neither the NTS nor Volume 1 make reference to the priority of this longstanding government policy and the requirement under planning law to place great weight on conserving and enhancing the Chilterns AONB. Nor does the documentation (here or elsewhere in the ES) present comprehensive and convincing evidence or argument that demonstrates that HS2 Ltd placed due priority and proper weight on seeking a route that avoided directly crossing the Chilterns AONB. The highly subjective statement (Section 9.2) that the project "is unlikely to result in any significant adverse effects on the special characteristics of the Chilterns AONB" emphasises the lack of attention and weight placed on this fundamental issue.

Limitations of HS2 Ltd's heavily biased initial remit

In outlining the background to Phase One of HS2, the NTS fails to mention that in early 2009, when the Government established HS2 Ltd to develop proposals for a new high speed railway between London and the West Midlands, the then Secretary of State agreed that two 'Absolute Requirements' of the HS2 Ltd remit should be:
the provision of a 'Heathrow International Station', and that
'There should be no intermediate stations between Heathrow International and West Midlands'.

These absolute requirements introduced a highly constrained bias into HS2 Ltd's option generation and short-listing processes which inevitable favoured route options that would have to cross the Chilterns AONB. Route options, such as any exiting London to the North (e.g. an M1 corridor alignment) rather than to the West towards Heathrow, were therefore subjected to relatively superficial evaluation in comparison and eliminated at an early stage without rigorous environmental examination.

This is indicative of the low priority attached to the conservation of the Chilterns AONB landscape throughout HS2 Ltd's work and the failure of the Company and the Government to have full and proper regard to the statutory and policy provisions referred to above.

Categories of Alternatives considered

Section 6.1 of the Summary (and para. 10.1.3 of Vol. 1) identifies the four categories of alternatives considered by HS2 Ltd. Neither here nor in the subsequent description of high speed rail alternative options evaluated is there any reference to HS2 Ltd identifying a *preferred alternative* option, should a route across the Chilterns AONB not be acceptable to Government or to Parliament.

This again demonstrates the lack of recognition and importance attached to the statutory and policy provisions referred to above. Those provisions could only properly be satisfied had HS2 Ltd conducted an in-depth rigorous comparison of their recommended cross-AONB route with a preferred option for avoiding the AONB. But no such alternative has been specifically identified, rigorously analysed and tested. The principal test of such a comparative evaluation, as set out in a train of successive policy and law, would be the objective weighing of conflicting aspects of what was in the national/public interest.

The current HS2 proposal is fundamentally flawed as a consequence.

Two further points need to be noted:
First, the opening paragraph of Section 1.2 of the Summary claims that 'Environmental assessment has been the foundation of route selection.' The omissions and failures of process highlighted above show blatantly that was not the case.
Second, notwithstanding any legal proceedings that may have addressed these fundamental issues, the ultimate decision is one of public policy as decided by Parliament through the hybrid bill process. That process has clearly been frustrated by these omissions and failures.

Influence of the West Coast Main Line (WCML) capacity issue

Both the company objectives for HS2 Ltd and the company's original restricted remit were promulgated on the basis of perceived future capacity restrictions on the WCML. The then Secretary of State confirmed that 'Passenger capacity' was 'the driving consideration' and first priority. That, together with the 'absolute requirement' for a Heathrow international station, not only precluded an unrestricted objective assessment of options that would avoid crossing the Chilterns AONB, but also precluded an unrestricted strategic assessment of all options:

- For linking the north of England to London by high speed rail, including routes that would have accessed the North via the East Midlands.
- That could provide a multiple track high speed rail link between HS1 and a new high speed rail route connecting London to the Midlands and the North with sufficient capacity to meet future demand for …
    - high speed rail services from mainland Europe to the Midlands and the North, and
    - domestic high speed services that would connect UK points South of London to major conurbations to the North of London.

There is no evidence that either HS2 Ltd or any other Government agency/department has conducted any such full strategic assessment.

Speed - Changed goal posts

The preoccupation of HS2 Ltd from its foundation with designing a very high speed route network (400kph) for future proofing purpose, coupled with the critical dependence of the HS2 project's business case on the value of time, introduced a further strong bias towards giving priority to the most direct cross-country alignment between West London and the West Midlands. This added further weight to the choice of a cross-Chilterns AONB route (the only AONB between London and Birmingham). It also reinforced HS2 Ltd's reluctance and failure to consider in parallel a preferred non-AONB route for the purpose of a fully objective comparison of the environmental costs of their recommended route.

In recent months, the Government has stressed that its support for a high speed rail project connecting London to the North is based on capacity, connectivity and on economic development, not high speed. This only serves to emphasise the inappropriateness of the original remit for HS2 Ltd (and its interpretation by the company), which effectively predetermined the specification, design and high cost of the HS2 proposal as it was further developed between 2009 and 2013. As a result, the HS2 project has evolved in a manner that has prejudiced fully objective assessment of the environmental and national value attached to protecting and conserving AONBs, and the Chilterns AONB in particular.

Tunnelling

Notwithstanding our concerns about the lack of a fully considered alternative to crossing the Chilterns AONB, HS2 Ltd has also failed to include in the Environmental Statement a rigorous evaluation of tunnelling under the whole of the Chilterns AONB. In the absence of a preferred non-AONB route option (one has not been properly identified and fully evaluated - even for comparison purposes), a fully tunnelled option should be the next logical step to demonstrate that the objectives of policy and planning law provisions to protect AONBs in the national interest had been fully considered. No such option has been fully evaluated for ES purposes.

For example, the advantages of a fully bored tunnel to the north of Wendover proposed by parties during consultation have not been seriously considered and evaluated. Such a tunnel would greatly reduce the environmental impact on the AONB, including wildlife. In addition it would lead to a substantial reduction in the amount of spoil. A fully bored tunnel through the Chilterns AONB would also substantially reduce the social and economic damage caused by up to seven years of construction, including the loss of visitors (see response to CFA 7).

There is, however, a very significant range of risks arising from any tunnelling through the Chilterns AONB that have yet to be fully assessed by HS2 Ltd (see following paragraphs). Those risks could have been minimised had HS2 Ltd decided at an early stage to select a tunnel alignment that would have passed through the interfluve between river valleys, rather than following a river valley floor. This fundamental error, which increases the risks of groundwater ingress, was committed at an early stage of the route selection process, no doubt in order to reduce overall project costs.

Water resources and supply risks

In August 2010 the Chiltern Society submitted a detailed paper to HS2 Ltd on the geology and hydrology issues of tunnelling through the Chilterns AONB aquifer. The paper, prepared by Dr Haydon Bailey, the Society's geological adviser, raised some serious concerns about the potential impacts of constructing a high speed rail route through the Chilterns. We suggested that a meeting between Dr Bailey and his colleagues and HS2 Ltd and its advisers might help clarify key issues. A meeting was refused and discussion with HS2 Ltd and their consultants did not take place until November 2012, well after the preferred route had been confirmed and local forum meetings had begun.

Dr Haydon Bailey's latest comments are set out in detail in the Society's responses to the CFA sections of this response. However, the following key points should be noted in response to the NTS:

- The Introduction to this project (Volume 1, page 158, Section 8.12.16) notes that "There are limited borehole records available from which to understand the local geological and hydrogeological conditions likely to be encountered for areas of below ground construction". No new boreholes have been drilled and logged, no new geological information appears to have been considered and groundwater flow is stated to be based on assumptions.

- Nowhere in this Environmental Statement is the underlying geology discussed in any detail whatsoever. Yet major tunnel construction is going to be carried out through this geology and potential disruption to both surface water courses and groundwater flow will inevitably ensue. The existing geological maps along the HS2 route show little or no structure (e.g. faults) at surface and yet examination of any outcrop or surface section shows the regular occurrence of such faults, joints and fractures, all of which would be major water conduits in the subsurface. The desk top studies carried out to date are totally inadequate.

- Railways are only put into tunnels when they have major physical features to cross below surface (e.g. HS1 river crossing and the English Channel). In the case of HS2, the physical feature to be crossed is the Chiltern AONB and the tunnelling is intended to mitigate the visual impact of HS2 onto the AONB. When a railway is on the surface it does not affect the hydrogeology of the region it is passing through; as soon as it is placed below ground into a tunnel it has an immediate impact on groundwater flow and water resources. The removal of the visual impact of HS2 on the Chiltern AONB through tunnelling will inevitably have a major impact on the water resources of the NW London/Chilterns area. This region already imports some of its water to provide for the existing population. Removal of current local water supplies due to tunnel construction will result in the major importation of water resources which otherwise might have been produced locally.

Inadequacies in the Environmental Assessment

Landscape

There is no convincing evidence that an holistic approach has been taken to assessing landscape and visual impacts, as is the firm expectation for an ES. Instead the focus has been on a diffused analysis of specific features.

Dumping several million tonnes of spoil from tunnels on adjoining land is completely unacceptable in an Area of Outstanding Natural Beauty - a landscape that is supposed to be protected by law. The proposed major re-profiling of parts of the ancient landscape of the Chilterns AONB is totally in contradiction to the whole purpose of designating an AONB in recognition of its highest quality of English landscape heritage. The importation into the AONB and dumping of large amounts of spoil extracted from outside of the AONB compounds the gross disregard of this fundamental issue.

Such dumping of spoil appears to be an expedient aimed at concealing the cost penalty of having to tunnel through an AONB, consequent upon the short-sighted original constrained remit for HS2 Ltd.

The provision of various overbridges, high viaducts, embankments, catenary towers and an assortment of barriers between South Heath in the AONB and Stoke Mandeville South, in the Aylesbury Vale will introduce a continuous swath of alien features right across the widest part of a treasured AONB landscape and setting. The preponderance of settling ponds and balancing ponds proposed adjacent to the track would also introduce an unnatural pattern of features within the AONB landscape. Even where the proposed route is tunnelled, the scale of ventilation shaft head houses in rural countryside areas would be totally out of keeping with an AONB location. Similar structures for alternative uses would be highly unlikely to gain planning permission.

Woodland

The ES makes the assumption that because 17 to 18 per cent of the study area (within 2km of the proposed route) is woodland, compared to 10 per cent nationwide, woodland in the area is therefore a receptor of "low sensitivity".

The UK is under-forested compared to the rest of Europe and needs a greater density of forest to help with CO2 reductions. Much of the woodland to be destroyed on the proposed route through the AONB is ancient woodland, with a complex eco-system developed over hundreds of years. Even the ES agrees ancient woodland is irreplaceable.

Woodland in this area is a receptor of high sensitivity. The proposed concept of replacing the loss of ancient woodland by new planting is an unacceptable compromise for the harm that loss of ancient woodland would do to the landscape integrity of the AONB. It should be noted that woodlands, including managed plantations as well as ancient, semi-natural woodlands, cover 12 per cent of the UK's land area (according to the ES it is 10 per cent) making the country one of the least wooded in Europe. At least 80per cent is less than 100 years old and just five per cent is classified as ancient woodlands.

Wildlife

The assessment of wildlife impact appears superficial and unprofessional. We have mentioned elsewhere the very limited field work on which the ES assessments are based. The manner in which the loss of local barn owl populations due to train strikes is lightly dismissed and compensated for, by erecting more barn owl boxes away from the line, reveals a lack of realism.

Also, for example, the ES reports the sighting of only one breeding pair of Red Kites in the Misbourne Valley. This is a significant underestimation, as any regular visitor to the valley will confirm. Again, it is indicative of the limited scale and questionable quality of the wildlife surveys conducted. The ES also fails to address the re-establishment of migration paths for deer, badgers and other smaller animals, reinforcing the apparent limited work in this relevant aspect of the AONB's natural environment.

Public Rights of Way

There is no mention in the ES that the proposed route crosses the Ridgeway, Britain's oldest road and a leading National Trail, as well as the Icknield Way, another ancient trail. They are simply mentioned, almost in passing, as potential impacts on recreation and leisure.

Similarly, there is little regard to the Chiltern Way circular long distance path round the Chilterns (the Chiltern Society's Millennium project), which crosses the HS2 route by Durham Farm, beneath the proposed Wendover Dean viaduct.

This limited analysis misses the key point that a major attractor of the Chiltern countryside is the density and attractiveness of its rights of way network and the multiplicity of alternative routes that it offers for peaceful recreation. Severance of key routes and realignment of diverted footpaths parallel to the rail track is a deterrent to walkers to use those routes. It demonstrates that little has changed in this respect since the M40 was built through the Chilterns.

Surveys to establish footpath use were carried out over a very short period. A longer period is needed to gain a true assessment.

The Chilterns is a much visited area due toits large surrounding populations, its proximity to London and its attractive scenery. Many visitors take advantage of the pleasant open spaces and use the extensive and well-maintained rights of way network.

To avoid spoiling the scenery and disruption for residents and visitors the preferred option is for HS2 to avoid the Chilterns altogether. If Parliament opts for the proposed route, a fully-bored tunnel under the AONB should be implemented.

If the Chiltern Tunnel is not adopted we urge the use of green bridges for rights of way, cycle routes, farm tracks and animal routes.

All rights of way should be retained regardless of the outcome of usage surveys.

Where it is necessary to close a route during construction we urge:

- that an alternative route should be used in all cases;
- the additional distance should not exceed 500 metres without good reason;
- the alternative route should meet the relevant standards and be pleasant to use;
- where the alternative route involves a road a footway should be provided in the interests of safety.

Route closure times should be kept to a minimum. We are disturbed to learn that in some cases a five year closure is envisaged. Such closures may deter people from walking/cycling in the countryside which would conflict with Government health policy which encourages exercise.

Where the HS2 route is on an embankment, the tunnel carrying a right of way / cycle track it should be provided with natural lighting as well as electric lighting.

Diverted and replacement routes should take account of the needs of disabled people.

Where the HS2 route is close to a bridleway suitable sound proofing should be provided to avoid disturbance of horses.

Information on closures and diversions needs to be publicly available to rights of way / cycle route users. Such information should be provided both on the ground and on the internet during and at least one month before diversion /closure.

It is understood that HS2 Ltd will be the Highway Authority for a strip of land adjacent to the route. Clarification is sought as to whom at HS2 Ltd is responsible and the plan for carrying out its duties.

Noise disturbance

The first Euston bound train will pass through the Chilterns AONB at 05.20 hrs and the last Euston bound train at 23.40 hrs. In between, with up to 36 trains an hour (i.e. a train passing through at intervals of less than two minutes), the peace and tranquillity of the AONB will be regularly disturbed for over 18 hours a day, every day. The maintenance regime will start at midnight and finish at 05.00 hrs This will also involve noise, especially rail grinding operations as well as intrusive lighting. No assessment has been made of the long term implications of this level of disturbance.

Air quality during construction

There are inconsistencies on the impact of dust during the construction of the Wendover tunnel and viaducts (see CFA 10 response).

Flawed or omitted impact assumptions

Treatment of the Chilterns AONB

A critical failure of the recommended proposal, as reflected by the ES, is that no higher standard of design and mitigation proposals has been applied to the route through the Chilterns AONB, despite its national designation as one of the nation's highest quality landscapes. The AONB has in essence been treated no differently to any other section of the proposed route. This was evident through the community forum and bilateral consultations.

The same criticism applies particularly to the proposed Code of Construction Practice, where one would have expected considerably higher construction standards to be applied to working practices within a precious designated landscape. We gather that an earlier proposal on these lines by the Chilterns Conservation Board was rejected. The Chiltern Society's position on this significant omission follows this part of our response to Question 1.

Landscape and visual assessments

New Landscape Character Assessments (LCAs) were commissioned, rather than using those that already exist that have been adopted by the local authorities. The assessment of the visual impact on long distance views was limited by the parameters chosen for assessing the Zone of Theoretical Vision (ZTV). There are no assessments of the impact of light pollution at night (e.g. from carriages and pantographs).

Social and economic impacts

The Socio Economic Assessment fails to consider the overall economy of the Misbourne Valley and omits reference to Prestwood, the largest community in the valley, and the community of Little Kingshill. The assessment of traffic generated in the construction period fails to recognise the inevitable fact that the main stress will fall on the A413 Amersham to Wendover section and the A355 Amersham to Beaconsfield section.

The ES also fails to assess the impact on the loss of tourism in the Chilterns. Many village pubs and cafes rely on visitors, and in particular walkers, for their trade. These people are likely to be deterred from visiting the area, particularly during the long construction period (see Volume 2 CFA responses). No account has been taken of the delay that school buses will be subjected to. There will also be an impact on children walking to school in Frith Hill. This will add 400 metres to their journey (10 minutes each way) and is described as a minor adverse effect. We disagree.

The ES states, surprisingly, that no farm enterprises in CFA 9 are sensitive to noise or vibration. However only eight owners have been interviewed, and no account seems to have been taken of horses, which are frequently sensitive to noise.

Poor quality research and preparation

The Environmental Statement is peppered with vague wording, ill-founded conclusions and basic inaccuracies. For instance, ecological conclusions are drawn from 12 months research (if that) even though the norm for determining baselines for such studies is not less than three years.

In analysing traffic flows in the rush hour, the "rush hour" has been incorrectly identified (and no account taken of the extra school traffic and hospital traffic, including ambulances that criss-cross the proposed construction area).

In CFA 9 (9.2.4) the ES says Public Rights of Way were "inaccessible" and therefore not included in the landscape and visual assessment. How can a Public Right of Way be inaccessible?

In assessing impacts of construction, for instance, or on landscape, woolly terms such as "moderate" or "reasonably practicable" are frequently used. Such terms are meaningless or have no relevance to those trying to assess the true impact of the scheme. For example, 100 per cent of the land at Elwis Field Farm is required in the construction period (Table 7, 3.416) yet the impact on the farm is assessed as "moderate adverse impact". This calls into question the whole basis on which impacts have been assessed.

Misleading illustrations

The artists' impressions and photo-montages in this section and throughout the summary and other documents are misleading. The gantries and overhead line equipment, which will form a permanent and highly visible intrusion on open countryside, particularly on viaducts where they cannot be shielded by planting, are barely visible in the illustrations. Also missing in the

scenic visualisations are the large and intrusive safety barriers to be established either side of the railway or the possibly more noticeable sound barriers which are proposed in open areas.

NB The above represents just a handful of many examples (see our responses to Volume 2 and the CFA volumes).

Code of Construction Practice - Requirement for Higher Standard within the Chilterns AONB

Key Issue

The draft Code of Construction Practice is seriously flawed in that it does not distinguish between the standards to be applied generally and those to be applied when operating within the Chilterns AONB.

Rationale

This serious concern can best be summarised as follows:

Whereas -

- All AONBs, together with the National Parks, are regarded by Government as representing the highest quality of landscape within England;
- Section 85 of the Countryside and Rights of Way (CROW) Act 2000 is intended to ensure that Areas of Outstanding Natural Beauty are not damaged by major development;
- The National Planning Policy Framework (NPPF) and the CROW Act 2000 require actions to 'conserve and enhance the natural beauty' of AONBs;
- The Chilterns AONB is the only AONB or National Park across which the proposed HS2 route passes (in either Phase 1 or Phase 2 of the proposed HS2 network construction);
- The River Misbourne is a globally rare chalk stream for which the local authorities, water utilities and environmental bodies have been co-operating on actions to achieve and maintain the Environment Agency's Good Ecological Standard;
- The ecological quality of the Misbourne is highly dependent upon the quality of the water collected from its river valley catchment area and drawn from the Chilterns chalk aquifer;
- The Chilterns chalk aquifer accounts for a substantial proportion of the water supply to the NW London/Chilterns region, which already additionally imports some of its water from elsewhere to provide for the existing population;

- Tunnelling through the Chilterns AONB will inevitably have a major impact on the water resources available to the NW London/Chilterns area, such that reductions in supply due to tunnel construction will result in the major importation of water resources which otherwise might have been produced locally.

- National wildlife and conservation organisations, together with others, are signatories to the Chalk Streams Charter that calls for the designation of all chalk streams as Special Areas of Conservation (SACs);

- The HS2 Phase 1 Environmental Statement does not state that the Code of Construction Practice should require higher contractor operating standards within the Chilterns AONB;

- The Environmental Statement and the draft Code of Construction Practice repeatedly use phrases such as 'as far as reasonably practicable' throughout those documents in a manner that leaves all contractors an excessively large degree of discretion, especially on operations conducted within the Chilterns AONB;

- There appears to be evidence that the Environmental Statement and the Code of Construction Practice have been drawn up in a manner that seeks to reduce costs at the expense of the environment, especially as far as the Chilterns AONB is concerned;

It is essential that -

- The Code of Construction Practice is redrafted to require higher operating standards to apply to all HS2 construction and other activities related to operations conducted within the Chilterns AONB;

- Those standards should be set in accordance with global best practice (i.e. highest/best in class) standards in all the relevant fields of activity;

- All contractors subject to the CoCP must conduct rigorous risk assessments and establish robust procedures that ensure that the risk of failing to meet those higher standards within the Chilterns AONB are minimised;

- In conducting risk analyses related to all operations within the Chilterns AONB, a 'precautionary principle' based approach should be used;

- All main contractors are required to produce, implement and keep updated as necessary an Environment Management Plan for their overall operations conducted under any HS2 contract relating to work within the Chilterns AONB and for all separate sites and/or individually distinct operations within the AONB *[Note: such practice would be wholly consistent with sound environmental guidance issued by the Environment Agency (for example - see Section 1.2 of Pollution Prevention Guidelines for Works and maintenance in or near water:PPG5)]*;

- Consistent with Environment Agency guidance (which states that all contractors should identify interested groups, including "Regulators, Local Authorities and nature

conservation bodies", about their plans to protect the environment), all HS2 contractors should consult with the Buckinghamshire County Council, the relevant District Councils and the Chilterns Conservation Board in the preparation (and preferably finalisation/ sign-off) of their Environmental Management Plans covered by the preceding paragraph.

- All operational interfaces between contractors, sub-contractors and other parties, or between different construction areas and/or other individually distinct operations under the auspices of a single contractor or sub-contractor are subject to comprehensive interface documents setting out the measures to be taken to manage the environmental aspects of interface operations conducted within the AONB (e.g. see CoCP 5.15)

Particular points arising from the use of loosely worded discretional provisions in the draft CoCP

The use of terminology such as "in so far as is reasonably practicable" and similar (see for example paras 3.4.3, 1.2.1) introduces a degree of discretionary flexibility and uncertainty that is unacceptable in relation to activities conducted within the Chilterns AONB.

In 15.2.1, for example, the CoCP requires adoption of the EA's pollution prevention guidelines only "in so far as it is reasonably practicable". This is totally unacceptable in a nationally designated area such as the Chilterns AONB. The EA guidance should be regarded as the minimum regulatory standard. That is insufficient as regards operations within an AONB or SSSI, within which global best practice should apply.

The Draft CoCP requires a risked based cautionary approach in relation to measures to reduce potential flood risk impacts (16.3.4). Such an approach, consistent with application of the precautionary principle, should be applied to all potential environmental risks arising through operations within the Chilterns AONB. The resulting measures should be clearly documented and their implementation closely monitored.

The Glossary provides a definition of 'Best Practicable Means'. However, despite the reference in that definition to 'having regard to local conditions', there is no indication generally that the drafters of the CoCP have perceived the Chilterns AONB as being an area where special 'local conditions' should apply.

The provision in 5.2.11 which covers the response to an emergency that could be harmful to the "public or local environment" requires the relevant local authority to be informed only "as soon as reasonably practicable". This is insufficiently precise for environmental emergencies within an AONB. Appropriate language should be agreed with the relevant local authorities.

Various provisions under Section 5.3 (e.g. "containing and limiting visual intrusion of construction sites", "maintenance of public rights of way" "retaining existing … hedges and earth banks") take on a much higher order of importance within an AONB and should be tightened accordingly. It is not adequate to rely upon "as far as reasonably practicable".

Similarly for 5.6.7 (regarding the risks of fencing and hoarding potentially damaging “sensitive habitats, trees or hedgerows”), 6.2.8 (regarding the “spread of soil-borne cop and animal diseases”) and various provisions under “Site Management”(7.2) e.g. “dust causing activities”, “location of stockpiles and mounds” and “haul routes”.

Provisions such as “soil spreading, seeding, planting” (7.2.6) etc and various cautionary provisions under “heritage assets” 8.1.4 , “Ecology” (9.1), Protection of trees” and protection of watercourses (16.3) should require consultation with the Chilterns Conservation Board to ensure harm to the AONB is avoided.

Volume 1 - Introduction to the Environmental Statement and the Proposed Scheme

The Chiltern Society

The Chiltern Society is a registered charity formed in 1965 to help maintain the uniqueness of the Chilterns in the face of growing pressures. It has grown into one of the largest environmental groups of its type in the UK, with 6,800 members, including nearly 500 active volunteers.

The Society works closely with local authorities, non-government organisations (NGOs), other registered charities and voluntary groups to:

- Maintain and monitor some of the 2,300 miles of footpaths and bridleways that cross the Chilterns
- Maintain and monitor the rare and fragile chalk streams that define the area as one of global environmental importance
- Conserve and manage woodland, meadows, historic buildings and village ponds
- Engage with schools and universities on education projects to ensure the distinctive environment and special nature of the Chilterns is recognised and appreciated
- Preserve and promote the unique and historic heritage of the Chilterns, which attracts hundreds of thousands of visitors each year
- Encourage high standards of planning and building design
- Organise weekly programmes of walks and cycle rides
- Create a photographic archive of the Chilterns

The Chiltern Society's view on HS2

The Society is not opposed to high speed rail in principle. The development or otherwise of high speed rail services in the UK is a matter for the UK Government and we hold no view on that.

The Society does object strongly to the proposed London to Birmingham HS2 route crossing the Chilterns and its Area of Outstanding Natural Beauty. We do not believe the route is justified or proven and that alternative routes have not been properly considered.

The AONB is a special and legally protected landscape. The Chilterns AONB is the *only* AONB to be directly affected by the proposed HS2 route in either the proposed Phase 1 or Phase 2. However, if this route is chosen by Parliament, the Society believes it is vital that the AONB should be fully protected by the construction of a tunnel under the entire AONB.

The Environmental Statement

The Society wishes to point out that had the extensions to consultation time being imposed by the Standing Order Committees of the House of Commons and then the House of Lords not occurred, it would not have been possible for us to make a detailed response because of the lack of time.

The Secretary of State for Transport has defended the imposition of a tight timeframe to respond on the basis that only a small percentage of the documents need to be read. However, even if respondents are looking only at part of the proposed route, this frequently means cross referring to one, two or even three more documents which takes considerable time and some expertise.

The final Environmental Statement (ES) included significant amounts of information not included in the Draft ES. We pointed out in our response to the draft document that there were a considerable number of errors between the Community Forum Area (CFA) reports and the accompanying maps. We further pointed out there were items on the maps which were unexplained in the CFA reports, and there were many, many gaps in the draft which were to be covered in the final ES. Many of these issues remain uncovered.

There are a number omissions, basic errors and unreliable assessments in the ES. We highlight some of these inadequacies later in this response to Volume 1 and even more in our detailed responses to the Community Forum Areas (CFAs) in Volume 2.

While we accept there are bound to be some errors and omissions in a document as complex as this, and put together in an unnecessarily rushed period of time, it needs to be borne in mind that this is the *last* opportunity the public and organisations such as ourselves have to comment in general on the proposals. It is very difficult, if not impossible, to make meaningful comments on proposals and assessments when the subject-matter to be commented on is missing, wrong or blatantly unreliable.

The way the ES is compiled also makes it very difficult to collate all the details on a particular point as the relevant information appears in a number of different volumes making it cross referencing a very tedious and time consuming prospect.

Illustrations in the ES

Many of the photo-montages and illustrations in this volume and throughout the ES and other documents are misleading. The gantries and overhead line equipment, which will form a permanent and highly visible intrusion on open countryside, particularly on viaducts where they cannot be shielded by planting, are barely visible in most of the illustrations. Also missing in most the scenic visualisations are the large and intrusive safety barriers to be established either side of the railway and the possibly more noticeable noise barriers which are proposed in areas of openness, although, in fairness, the figure 29 on page 72 gives a more realistic impression of the visual impact of noise barriers.

Overall though, we believe the illustrations fail to give a realistic impression of the impact the proposals will have on the surrounding countryside. A visit to HS1 or the West Coast Mainline will give the public a better idea.

Hybrid Bill procedure

The Hybrid Bill procedure does not enable the Select Committee to hear petitions which seek to challenge the principle of the Bill. This is a serious flaw.

The House of Commons should, at the Second Reading of the Bill, instruct the Select Committee to consider such petitions. If it fails to do so it will result in the Bill eventually passing into law without detailed consideration of the HS2 business case, its environmental consequences or a detailed examination of whether there are better alternative routes.

These issues are fundamental to the raison d'être of the entire HS2 project. They may well be touched on at the Second Reading of the Bill but will not be subject to the rigorous examination they would receive in the committee stage if Parliament was dealing with a normal private Bill.

It is especially important that the HS2 Select Committee should be allowed to include such issues within its remit bearing in mind that previous reports by Select Committees (Transport Committee and Public Accounts Committee) have been scathing about aspects of the HS2 proposal, and that a report by the Major Project Authority (MPA) was blocked from publication by the Secretary of State for Transport, using exceptional powers and overruling the Information Commissioner. An earlier report on HS2 by the MPA categorised the project as amber/red meaning it was unachievable or in doubt.

We believe it is crucial that all MPs have the opportunity to see the full contents of the MPA report before they debate and vote on the second reading of the Bill.

The integrity of the Select Committee

The public inquiry into the proposal to build a fifth terminal at Heathrow in the 1990s took nearly five years to conclude. This was criticised at the time, but there was no criticism about the thoroughness of the procedure. Not a stone was left unturned: every relevant issue and potential impact was considered in detail by a truly independent, non-political panel with expertise in a number of relevant areas. The outcome may not have pleased all parties but there were no complaints or challenges to the outcome because everyone knew it had been thoroughly examined.

The HS2 proposal is much bigger than the Terminal 5 proposal. The disturbance it will cause covers a far greater area, the number of potential impacts during construction and thereafter run into tens of thousands. It would be impractical to conduct a traditional style public inquiry into such a vast proposal, but the question can be asked: will the Hybrid Bill procedure be thorough enough to leave no stone unturned; to satisfactorily consider all the potential impacts? The sensible conclusion is that it will not.

At the time of writing this response, the three main political parties, the Conservatives, Labour and Liberal-Democrats, are all in favour of HS2 in principle and of the proposed route

in particular. Although the MPs that will form the Select Committee to consider the Bill will be drawn from constituencies not directly impacted by HS2, it is inevitable that many, if not the vast majority, will be members of the political parties currently in favour of the proposal and its route. This will detrimentally affect the perception of the independence of the committee.

2. Background to High Speed Two

Evolution of HS2

The ES describes the need for HS2 and the Government's vision (2.1.1 and 2.1.2 0.) The statement however does not indicate how the goalposts have moved since HS2's conception.

In 2009, when the Government first introduced the concept of a high speed rail link between London and Birmingham, one of the principle considerations regarding a route was based on the ability for trains to travel at up to 250mph. An "absolute requirement" outlined in the original terms of reference was one for a link to a Heathrow International Station.

This "absolute requirement" and a need for speed - meaning that curves and track deviations had to be to a bare minimum - are not mentioned in Volume I background statements (2.2.3). This is important because the inclusion of those two factors *inevitably* led to a selection of potential routes that crossed the Chilterns and the Chilterns Area of Outstanding Natural Beauty.

In recent months the Government has said the need for HS2 is not based on speed or a direct connection to Heathrow. The new priorities are to increase rail capacity and enable better economic development in parts of the north of England and the Midlands.

We would suggest that these new priorities do not necessitate a route crossing the AONB. The fact is that the ball was set rolling in 2009 on a different set of priorities and there has been neither the will nor the inclination to stop it even though the priorities have changed.

No alternatives for the HS2 route have ever been seriously considered or examined. As a result, the HS2 project has evolved in a manner that has prejudiced fully objective assessment of the environmental and national value attached to protecting and conserving AONBs, and the Chilterns AONB in particular. This is a serious flaw. (Please see our detailed response to section 10 of Volume 1, below.)

The subsequent consultations therefore have been so restrictive as to be almost meaningless.

3. Approach to consultation and engagement

Overview

The consultation and engagement, such as it is, has been undertaken in isolation and not within a wider transport context.

The Society, along with a number of other national and regional environmental groups, is a signatory to the Right Lines Charter, the first principle of which states:

'High Speed Rail proposals need to be set in the context of a long-term transport strategy stating clear objectives. The Government's High Speed Rail proposals are at present not part of any comprehensive long term transport strategy or nationally agreed priorities. By contrast, all the other countries developing High Speed Rail are doing so within a national framework. Objectives need to be ambitious yet realistic and could include: reducing the need to travel, improving rail capacity and connectivity throughout the country, reducing regional economic disparities and ending dependence on oil."

In our view it remains a fundamental mistake to consider the development of a high speed rail network in isolation from the future development of air and road networks.

The Government has no current strategy for expanding airports. It is the Society's view that a new rail network cannot be planned or proceed until a decision is made on the location of future expansion of UK airports.

Further, as stated in our response to the background to HS2, outlined above, and in our response to the non-technical summary, there was no rigorous comparative testing of alternative routes to those proposed through the Chilterns in the consultations.

Neither here, nor in the subsequent description of high speed rail alternative options evaluated, is there any reference to HS2 Ltd identifying a 'preferred alternative' option, should a route across the Chilterns AONB not be acceptable to government or to parliament.

This again demonstrates the lack of recognition and importance attached to the statutory and policy provisions for the AONB. Those provisions could only properly be satisfied had HS2 Ltd conducted an in-depth rigorous comparison of their recommended cross-AONB route with a preferred option for avoiding the AONB.

No such alternative has been specifically identified, rigorously analysed and tested. The principal test of such a comparative evaluation, as set out in longstanding policy and law, would be the balancing of conflicting arguments of what was in the national interest.

Consequently the current HS2 proposals are severely undermined.

Community forums

Society representatives attended many of the community forums in the Chilterns. The HS2 Ltd representatives at the forums were frequently unable to provide answers to questions either at the forum or in subsequent follow-up. Some of the meetings broke up in anger and frustration.

The ES states (3.2.9) that community forums were to *'inform local people…consider local issues …and identify community benefits'* implying that local communities were kept fully informed and their questions answered. This was not the case. The community forums were poorly presented, inadequately minuted, inadequate and failed to resolve issues many residents and community representatives wished to raise.

5. Permanent features of the proposed scheme

Rail Corridor

The rail corridor, approximately 19m from fence to fence (5.1.1) contains potentially dangerous equipment including, of course, electricity cables and overhead line equipment. There are no details in the ES of the security and safety requirements needed to protect the public and potential passengers and rail staff.

We can find no reference to the height and nature of the security barriers, or what special measures will be needed, if any, to the sides of the bridges and footpaths that will cross the rail corridor. Will strengthened barriers will be required on bridges crossing the track, and at what height will they be? These are issues that should be addressed in the ES.

Cuttings and embankments

As previously stated the Chiltern Society believes that if the proposed route is adopted, the whole of the Chilterns should be tunnelled, especially as the Area of Outstanding Natural Beauty is designated of special quality because of its unique landscape. The imposition of cuttings and embankments will be an alien feature on this precious setting.

The specifications set out for the cuttings and embankments (5.2.1 to 5.2.4) take no account at all of the AONB, or of requirement to take special measures to mitigate the impact in a protected area.

If the Chilterns AONB is not to be fully tunnelled in the event of this route being accepted, the minimum required mitigation is to return the landscape to its original contours. This may mean deeper cuttings, but then, if necessary, footpaths, roads and animal migration paths could be accommodated within green bridges, notwithstanding our reservations about green tunnels (see tunnelling section), thus reducing the intrusion on the landscape.

Drainage and watercourse realignments

The imposition of balancing ponds at various intervals along the railway corridor - some up to 1.5ha - introduces another alien concept to a protected landscape. No mention is made in this section of railway drainage (5.3.1 and 5.3.2) of the impact of such ponds on the special qualities of the AONB, nor of any security or fencing arrangements that will presumably need to be added in the vicinity of the ponds, all of which adds to the visual intrusion and safety risk.

Rivers and streams will be reinstated (5.3.8) *where reasonably practicable,* with a natural looking appearance. A firmer commitment than this is needed, particularly in areas of high sensitivity such as AONBs, areas of Special Scientific Interest (SSSI) an recreational areas, such as the Colne Valley Park.

Diverted roads and public rights of way

It is unacceptable in an AONB to state (5.4.1) that roads and public rights of way realignments will be designed to blend into their surroundings *as far as possible.* Where this occurs in the AONB the requirements regarding realignment should be much stricter.

Tunnels

There is no rigorous evaluation of tunnelling under the whole of the Chilterns AONB in the ES. This is a further serious omission.

In the absence of a non-AONB route option, a fully tunnelled option should be the next logical step to demonstrate that the objectives of policy and planning law provisions to protect AONBs in the national interest had been fully considered. No such option has been fully evaluated for ES purposes.

The advantages of a fully bored tunnel to the north of Wendover proposed by parties during consultation has not been seriously considered and evaluated. Such a tunnel would greatly reduce the environmental impact on the AONB, including wildlife. In addition it would lead to a substantial reduction in the amount of spoil. A fully bored tunnel through the Chilterns AONB would also substantially reduce the social and economic damage caused by up to seven years of construction, including the loss of visitors.

Railways are only put into tunnels when they have major physical features to cross below surface. In the case of HS2 the physical feature to be crossed is the Chilterns AONB and the tunnelling is intended to mitigate the visual impact of HS2 onto the AONB. When a railway is on the surface it does not affect the hydrogeology of the region it is passing through; as soon as it is placed below ground into a tunnel it has an immediate impact on groundwater flow and water resources. The removal of the visual impact of HS2 on the Chilterns AONB through tunnelling will inevitably have a major impact on the water resources of the region. This is a region which already imports some of its water to provide for the existing population; removal of current local water supplies due to tunnel construction will result in the major importation of water resources which otherwise might have been produced locally.

Green tunnels

The term "green tunnel" implies an environmentally friendly construction which could be misinterpreted by the public. Although generally preferable to cuttings and proffered by the Chiltern Society as a second or third option, the green tunnel alternative has considerable drawbacks.

A green tunnel is a cut and bill excavation which totally removes the existing structured chalk prior to the emplacement of concrete tunnels, backfilled with now disaggregated, unstructured chalk. Any original natural drainage pathways, via joints and fractures in the chalk, will be completely destroyed. The final replanted ground surface may appear to be natural but the changes in the substructure will impede and alter both surface and groundwater flow.

Portals

The illustrative design of the portals in a rural location (5.7.2) show no appreciation or acknowledgement that four portals will be located within the Chilterns AONB. It is another example of the ES ignoring the Countryside and Rights of Way Act which places a statutory duty on relevant authorities "to have regard to the purpose of conserving and enhancing the natural beauty of the AONB when exercising or performing any functions affecting land in the AONB".

Ventilation and intervention shafts

The ventilation shafts and their accompanying headhouses need considerable mitigation, particularly in the AONB, as they will be permanent intrusions onto the landscape that neither conserve nor enhance its natural beauty. No mention is made in Volume 1 (5.7.1 and 5.7.2) of the associated access roads, security fencing and lighting, all of which will intrude aggressively onto the landscape scene. The ES refuses to acknowledge or address the special mitigation care that will be needed with these buildings in sensitive areas.

Viaducts

The viaducts proposed through the Chilterns are the first such structures to be built in the area of any significance. The long, sweeping viaduct across the Colne Valley Park will be significantly intrusive with untold and unknown impacts on the ecology and wildlife that thrives in the park, as well has recreational interests of the park's many visitors. The ES states that a piling method for this viaduct that will mitigate contamination of ground water *has yet to be chosen.* This is unsatisfactory for an important environmental area. It is unreasonable to expect people to comment - in this, their the last opportunity for public involvement - without such crucial information. It indicates yet again the undue haste and ill-preparedness of this ES.

The viaduct near Wendover, in the Chilterns Area of Outstanding Natural Beauty, will be a scar on the precious and open landscape, no matter how elegantly it is designed (although, yet again, there is no mention of any special mitigation or design measures to take account of the fact that this is AONB). Here, unless effective barriers are in place, noise will be a factor as trains cross a valley bottom on the viaduct, as will light intrusion at night. The centenary towers perched on the viaduct will be ugly, alien features, visible from a long distance. A viaduct is wholly unacceptable in this protected area, illustrating again the need for consideration of a full Chilterns tunnel.

6. Construction of the proposed scheme

Overview

The Chiltern Society believes that the impact the construction of the proposed scheme will have on the Chilterns area has been downplayed and misrepresented in the ES. We consider this in detail in our response to Volume 2 (CFA 7, 8, 9 and 10); Volume 3 (route-wide effects) and Volume 5 (appendices and map books).

There are serious errors and misunderstandings of the Chilterns area made in reaching conclusions about the construction impact. The cumulative impact on the entire Chilterns area has not been properly considered.

For instance:

- The estimation of the peak periods on local roads is incorrect. The "rush hours" in the area go way beyond the 8am to 9am and 5pm to 6pm times assumed. This fails to take into account the thousands of commuters who travel by road to and from this area.

- In the Colne Valley, for instance, a pm peak shows six roads, including the A40, where the Baseline flow is just one vehicle in the one hour period. There are several other ridiculous anomalies throughout the CFA assessments and Volume 5.

- At least 32 public rights of way will be closed or diverted for periods from six months to three years in the Chilterns.

- Eighteen work camps will be established in the Chilterns, some operating for up to seven years. A workforce in the region of 1,000 people will be involved.

These are just a few examples.

The construction of HS2 in the Chilterns will have a significant and negative effect, not only in terms of traffic, but on the economic and social welfare of the communities in the area. The cost to local and regional business will be noticeable. (see our responses to Volume 3).

The construction of a full tunnel under the Chilterns AONB, facilitating the removal of waste via the tunnel as it is being built, as in the construction of the Channel Tunnel, would considerably mitigate the impact on the entire Chilterns area.

We believe a full examination of this proposal, including potential savings balanced against any potential additional expenditure, must be considered before final construction decisions are made.

Purpose of the Code of Construction Practice

There is no explanation why the CoCP remains in draft (6.3.4). There is no description of the accountability measures to be imposed on the nominated undertaker and its contractors. There is no attempt to apply different and more stringent codes of construction practice in the AONB. This is all unacceptable.

7. Environmental Impact Assessment

General assumptions and limitations

The preparation of the Environmental Impact Assessment (EIA) is, in our view, woefully inadequate. Here are three examples:

- The ES states (7.7.2) that it has not been possible (for surveyors) to access all the land required to carry out fully comprehensive surveys. Nevertheless it is considered that the baseline studies are sufficiently robust to allow the assessment of the likely significant effects of the scheme. The previous section on construction, referring to advanced works (6.4) admits that further detailed site investigations and environmental surveys will be required. These include further surveys and investigation into issues such as contamination remediation, habitat creation and translocation, archaeology and built heritage.

- Nowhere in the ES is the underlying geology discussed in any detail whatsoever. Yet major tunnel construction is to be carried out through this geology. Potential

disruption to both surface water courses and groundwater flow will inevitably ensue. The existing geological maps along the proposed HS2 route show little or no geological faults at the surface, yet an examination of any outcrop or surface section shows the regular occurrence of such faults, joints and fractures, all of which would be major water conduits in the subsurface. The desktop studies carried out to date at totally inadequate.

- The EIA compares the future transport and passenger movement patterns resulting from Phase 1 with the predicted transport and passenger movements if HS2 was not built (7.2.5), otherwise known as the 'do minimum case'. This is a further example of assumptions being made in isolation. Similar transport and passenger movement predictions have been made by consultants working for the 51M group of local authorities which deliver as much capacity as HS2 without constructing HS2. A more useful exercise would be to compare the EIA assessment against the 51M assessment.

Given the given the enormous scope of this project and the time allowed for the preparation of the EIA, it was perhaps inevitable that corners would be cut and sweeping assumptions made without proper investigation. The result is an Environmental Statement that lacks detail or rigour. Such inadequacy would be a concern if it involved any large scale development anywhere in the country. When it involves a major infrastructure project across sensitive and protected landscapes it is a major worry.

8. Scope and methodology summary for environmental topics

Introduction

This section of Volume 1 covers the scope and methodology for the EIA topics. The Society's detailed responses to these topics can be found in our comments to Volume 2 and Volume 5

Agriculture, forestry and soils

Ancient woodland is woodland that has existed continuously since 1600 or before. As a result of that lifespan most ancient woodland has developed its own unique environment: many ancient woodland provide a sole habitat for some animal and plant species. That is why they are often described as an irreplaceable resource. The assumption (8.1.8) that all displaced ancient woodland soil will be translocated to form the basis of new woodland planting should not lead to an assumption that ancient woodland can somehow be translocated (a view postulated by a former Secretary of State for Transport).

A further assumption suggests, for example that because 18 per cent of the study area in CFA 10 and 17 per cent in CFA 9 is wooded - compared to the national average of 10 per cent - the amount of woodland lost is somehow insignificant, or "a resource of low sensitivity". This is wrong and ill-thought through. The UK is under-forested compared to the rest of Europe. The country needs a greater density of forest to help with CO2 reduction. As most of the woodland on the route is ancient woodland it makes it even more sensitive as a receptor.

Similar controversial assumptions are made with regard to Best and Most Versitile (BMV) land. Here again the general assumption is that because there is a lot of BMV land on the proposed route the impact of its loss is "moderate". This would not be the view of the agricultural users of the land.

Air quality

There are instances in the ES where air quality assessments need to be revisited because of inconsistencies (see our response to Volume 5).

Community

The baseline information (8.3.5) is incomplete and insufficient to draw adequate conclusions about the impact of the project on the Chilterns community. Many communities within the Chilterns are interlinked by necessity. People living in one community visit other communities for education, leisure, health and social facilities for instance. Commuting between communities, as well as to and from larger centres for work is more prevalent in the Chilterns that the average rural/semi-rural area.

Village communities including Prestwood (population 9,000), Little Kingshill (population 800) have not been included in any community assessment. Communities near Wendover, especially to the west, such as Ellesborough, have also been omitted.

The ES considers that the Colne Valley Regional Park is large enough to absorb the construction of HS2 and retain its function, without apparently taking into account other proposed developments within its catchment and the fact it is already under stress, affected by noise and pollution from the M40/M25/A40.

We expand on these points in our response to Volume 2 (CFAs 7/8/9/10) and Volume 3 (route wide effects).

Cultural heritage

The ES states there is no specific national guidance of methodology for assessing the impact of projects on heritage assets(8.4.5) and records (8.4.6) that national planning policy requires that impacts on heritage assets are assessed in relation to the significance of the asset. The Society has responsibility for two heritage sites - England's oldest smock windmill at Lacey Green and the historic Ewelme Watercress Beds - and has others in the pipeline. We note the comments in the ES with regret.

Notwithstanding the lack of national guidance however, the importance of the Chilterns area to the nation's cultural heritage cannot be over-estimated. It is regretted, and to its detriment, that no attempt has been made in the ES to assess the importance of this heritage along the entire Phase 1 route generally, and the Chilterns AONB specifically.
The Community Forum Area 8 alone (Amersham, Chalfont St Peter and Chalfont St Giles) has four grade I listed buildings, 251 grade II listed buildings, five conservation areas, one grade II registered park and 21 areas of ancient woodland, most assessed as high value in the ES, and all of which will be impacted to various degrees by HS2 and its construction.

In addition, the project will bring about the loss of an extensive range of archaeological assets, including pre-historic, Bronze Age, Iron Age, Roman and mediaeval remains, as well as ridge and furrow field patters. The Chilterns Grim's Ditch, a significant Iron Age earthwork and a scheduled ancient monument will be severed and partially destroyed.

The construction of HS2 and its eventual permanent placement will have impacts on these supposedly protected properties and assets which the ES fails to quantify. In section nine of Volume 1 HS2 asserts its approach to mitigation in priority order is to Avoid; Reduce; Abate; Repair and Compensate. Without full assessments on these areas, it is not possible to fully assess how the impact could be reduced, abated, repaired or compensated. Thus, the only practical solution is to avoid the area altogether.

We expand on these points in our response to Volume 2 (CFAs 7/8/9/10) and Volume 3 (route wide effects).

Ecology

Significant areas have not been assessed for the potential impact on the ecology while other surveys are incomplete (see our response to Volume 2 (CFA 8, 9 and 10). References to threatened species mentioned in the draft ES are not referred to at all in this ES (the White Helleborine, a species of principal importance in the Wendover Rifle Range and North Lee grassland for instance). These surveys need to be completed before the second reading of the Bill.

There are surprising ecological conclusions in the ES. For instance, the construction area of HS2 ends within 25 metres of the Bacombe and Coombe Hill SSSI, and yet the ES concludes there will be *'no impact'* on the SSSI.

The assessments rely on the Code of Construction Practice being properly implemented (we point out elsewhere in our response that the CoCP is still in draft). The experience during the construction of HS1 in Kent was that the CoCP was not properly implemented. There is nothing here to reassure the public that the same situation will not be repeated.

There are a considerable number of locations where HS2 ecology consultants were not permitted access to conduct a Phase 1 habitat survey. Such studies usually take many months to complete, assuming full access is completed. In view of the time constraint and the lack of access the conclusions reached are, for the most part, at best inaccurate and at worst incorrect.

The impact on bird habitats is devastating in parts and the evidence unreliable in others. More than half the Denham Country Park nature reserve is required for HS2 construction at considerable cost to bird and plant habitat. A report by the RSPB in 2012 stated that a fifth of British birds had disappeared in the last 50 years, primarily because of a lack of habitat. The Government must insist these threatened habitats are protected. Around Great Missenden the ES reports that one breeding pair of red kites were spotted on one side of the village and two pairs on the other. These figures are a gross underestimation as any regular walker of the Misbourne Valley will confirm. They undermine the credibility of the ecology report.

The Society shares the view of Mr M. Jackson the head of conservation strategy at the Berks, Bucks and Oxon Wildlife Trust that the ES "overeggs the effectiveness of its mitigation measures" and that the proposals "do not go near what a normal planning application would propose for mitigation, let alone be an exemplar example for how to do things."

We share also the view of Dr C. Williams, director of conservation at the Bat Conservation Trust, who is concerned about the inadequate standard of surveying supporting the ES. We endorse her view that "on such a major project, with equally major potential ramifications for bats and other wildlife, it is vital that high professional standards are maintained."

Land quality

Not all of the sites considered to have the greatest potential for contamination have been visited or are due to be visited. The assessment relies on a desk-top study. This is not satisfactory in an AONB. All sites should be visited and reported on to Parliament before the second reading of the Bill.

The ES states that contaminated soils will be removed or rendered inactive "wherever reasonably practicable." Presumably, where it is not deemed "reasonably practicable" contaminated soils will be left exposed and accessible. This is not acceptable and potentially dangerous.

Landscape and visual

Our full response to the landscape and visual aspects of HS2 within the AONB is contained in our comments on Volume 3, (Route-wide effects). We note that to establish the baseline landscape character of the AONB field studies were undertaken between July 2012 and July 2013. There is no breakdown of where the locations used were or how often they were visited during the winter, spring, summer and autumn seasons.

As part of our response to this vital element in Volume 1, we reiterate the views of Natural England, the government's advisor on the natural environment, on the role of Areas of Outstanding Natural Beauty, with our italics for emphasis: "AONBs are areas of high scenic quality (with) *statutory* protection…to *conserve* and *enhance* the natural beauty the landscape."

It adds: "AONBs are designated *solely* for their landscape qualities, for the purpose of *conserving* and *enhancing* their natural beauty, which includes *landform*…they are designated under the provisions of the National Parks and Access to Countryside Act, in order to secure their *permanent* protection against development that would damage their special qualities, thus conserving a number of the *finest landscapes in England* for the *nation's benefit."*

In its description of impacts on the AONB in Volume 3 (2.6.3) the ES lists the most apparent (but not all) changes to the character of the AONB. These are:

- The presence of new engineered l*andforms* cutting across the eastern side of the Misbourne Valley towards the Aylesbury Vale
- The presence of two new viaducts of approximately 18m and 12m in height and 500m each in length with associated infrastructure
- The presence of noise fence barriers that will create *man-made linear features*
- The *permanent* severance of land

- The presence of new highway infrastructure in the rural environment, including road bridges

- The presence of overhead line equipment

- The presence of regular high speed trains

- The *noticeable loss of vegetation*, in particular at Mantle's Wood, Sibley's Coppice and Jones' Hill Wood, *opening up the landscape and altering the vegetation pattern*

The Society's view is simple. The AONB has statutory protection to preserve it for the nation's benefit. Any man-made intervention should, by law, only conserve or enhance the AONB.

HS2's own assessment of its impact on the Chilterns AONB does not conserve or enhance it. It changes landforms and introduces man-made elements that deface the natural beauty of the landscape. The ES makes no special attempt to mitigate the visual appearance of HS2 throughout the whole of the AONB. The requirements of the Act are, in the main, ignored.

There have been incursions in the AONB, against the spirit and the intention of the Act, before, most notably with the construction of the M40 through the AONB in the 1970s. As currently proposed HS2 represents the biggest disregard of the Act by far. Its approval would set a worrying precedent and represent a genuine threat to other AONBs, National Parks and protected landscapes.

Socio-economics

The baseline information used to assess the socio-economic effects concentrates on the impacts upon business. Our detailed response to this is featured in our comments on Volume 3 (Route wide effects).

The baseline information does not consider the social impact of the line on communities in the Chilterns, particularly during the long construction period. There are potential delays for people attending Stoke Mandeville Hospital, Amersham Hospital and Wycombe Hospital who will need to cross the construction area. The construction also cuts across the catchment of the Chilterns Crematorium at Amersham. The heavier traffic flows will impact on people attending funerals.

Similarly, as expressed in the section on communities, no account of the impact on people living in one community and visiting other communities for education, leisure, health and social facilities. Nor is any account taken of the impact of the scheme on people visiting the area.

No account is taken of the potential losses to property owners near HS2 who will suffer a loss of valuation on their property because of blight.

Sound, noise and vibration

Although people respond differently to noise - some finding it more disruptive than others - there is no avoiding the fact that HS2 will bring noise to some areas which are currently quiet.

The baseline estimates that the average noise levels will be in the region of 45 to 50 decibels. Government research into aircraft noise accepts that 57 dBA marks the onset of "significant community annoyance." Like aircraft noise, the noise nuisance created by HS2 will not be consistent, but hitting regular peaks due to the passing of up to 36 trains per hour.

Volume 1 agrees there are tranquil areas in the Chilterns. This tranquillity in the hidden valleys affected will be lost, with a potential effect not only on people but on wildlife. All this signifies why the entire AONB should be avoided or, at the very least, tunnelled throughout.

The ES states that the majority of receptors along the proposed route are not currently subject to vibration. That is almost certainly the case.

Traffic and Transport

The Society's detailed response to traffic and transport issues appears in Volume 2 (CFAs 7/8/9/10), Volume 3 (route wide effects) and Volume 5 (technical appendices). We believe there are considerable weaknesses in the scope and methodology used. For instance:

- The rush hours are incorrectly claimed to be between 8am and 9am and 5pm and 6pm. In the Chilterns area the rush hours are extended far beyond these times.

- The assumptions fail to take into account the frequent and long distance school bus trips which criss cross the area or the extensive commuter traffic

- The ES fails to identify the routes likely to be taken by traffic to avoid congestion during the construction period.

- The ES fails to appreciate how local lanes will suffer, particularly near construction sites, from increased traffic flow

- The ES fails to recognise that the majority of the roads to be used during the construction period are already or near to full capacity

- The assumptions appear to take no account of incidents like accidents, poor weather or local road works which often add to further delays on major and minor roads

The language used in assessing traffic and transport impact in the Approach to Mitigation Section is invariably vague and flabby. For instance "*in general* the assessment has been based…(8.10.10): Traffic management mitigation *may include*…(9.13.2): PRoW's…*will usually* be substituted (9.13.4): Access will be maintained…where *reasonably practicable* (9.13.4). These are just a few examples, but illustrate how difficult, if not impossible, it is for the public to make meaningful judgements and pass appropriate comments on the ES.

Water resources and flood risk

The Society's detailed response to water resources and flood risk issues appears in our comments to Volume 2 (CFAs 7/8/9/10) and Volume 5 (Technical appendices). We believe there are serious inadequacies in the scope and methodology involved in this topic:

- Nowhere in the ES is the underlying geology discussed in any detail whatsoever. Yet major tunnel construction is going to be carried out through this geology and potential disruption to both surface water courses and groundwater flow will inevitably ensue. The existing geological maps along the HS2 route show little or no structure (e.g. faults) at surface and yet examination of any outcrop or surface section shows the regular occurrence of such faults, joints and fractures, all of which would be major water conduits in the subsurface. The desk top studies carried out to date are totally inadequate.

- An experienced geological and environmental expert has advised the Society that there is a real risk of the disappearance of the River Misbourne at ground level and that it is difficult to envisage Shardeloes Lake surviving under current proposals. Any damage to the Misbourne aquifer during and after tunnelling will impact onto the regional water supply (see Society response to Volume 2, CFA 8, section 13)

- No new boreholes have been drilled and logged, no new geological information appears to have been considered and groundwater flow is stated to be based on assumptions.

- Little, if any, regard has been paid to the risk of polluting the water supply through tunnelling.

- The potential risk to London's water supply (the Colne catchment supplies 22 per cent of London's drinking water) has not been properly assessed.

- Green tunnels sound environmentally friendly but from a water resources perspective they will impede and alter surface and groundwater flow. The ES seems not to clarify this.

- The removal of the visual impact of HS2 on the Chiltern AONB through tunnelling will inevitably have a major impact on the water resources of the region. This is a region which already imports some of its water to provide for the existing population; removal of current local water supplies due to tunnel construction will result in the major importation of water resources which otherwise might have been produced locally.

9. Approach to mitigation

The ES states that the first step in the approach to mitigation is to Avoid. The Society believes this is the appropriate mitigation for the Chilterns AONB.

Throughout the ES there are examples of finding a problem first and then trying to mitigate it. An example (CFA 9, section 13) talks of monitoring to determine the potential impact to the public water supply. The relevant section (13.4.18) states:
"The monitoring schedule will include monitoring before, during and after construction until the groundwater quality has stabilised within acceptable limits…the data will be assessed and used to define appropriate mitigation, should it be required."

In other words, if we find a problem we will try to mitigate it. The best method of mitigation is avoidance.

10. Strategic and route-wide alternatives

Introduction

The Society believes a fundamental failure has run through the development and technical assessment of the HS2 proposals since 2009, namely the failure to identify and comparatively evaluate a preferred alternative route which did not cross the Chilterns AONB.

Without such a fully evaluated alternative to HS2's recommended route right across the widest part of the Chilterns AONB the current HS2 proposals are fundamentally flawed. They:

- Fail to meet the underlying objective of the Environmental Impact Assessment regulations requiring the identification and justification of the proposer's choice of main alternatives 'taking into account the environmental effects'.

- Seriously undermine and devalue to ridicule the Non-technical Summary section statement that 'Environmental assessment has been the foundation of route selection'.

- Fail to satisfy the purpose of UK planning law of conserving and enhancing the natural beauty of AONBs and the well-established thrust of planning policy that major developments should only take place in AONBs in exceptional circumstances following the most rigorous examination of options for avoiding development in an AONB.

- Ignore accepted industry best practice to thoroughly investigate and compare the best environmental option against options preferred in order to satisfy other criteria.

- Fundamentally ignore and frustrate the role of Parliament, through the hybrid bill process, to thoroughly assess conflicting aspects of what is deemed to be in the national interest.

This fundamental error can be traced back to the narrowly constrained remit given to HS2 Ltd in 2009. This was not fit for the purpose and weight subsequently placed on the HS2 proposal by the Coalition Government.

Belated subsequent attempts by the Department for Transport to place the HS2 proposal into a national rail strategy context were not sufficiently independent or thorough. They were equally flawed through undue weight being placed on consistency with HS2 Ltd's specific remit, preceding work and recommendation, as witnessed by the following statements (our italics)

'… at the same time as the Government has been considering and *comparing the emerging HS2 scheme* with the strategic alternatives'. (10.1.3)

'In parallel with HS2 Ltd's work … DfT *explored* the strategic options … between London *and the West Midlands* …'. (10.3.1)

Strategic high speed route options

The ES states (10.3.6) 'Though the Proposed Scheme is a discrete project that can be justified on its own merits, it has been conceived as part of a long term strategy for a network of high speed lines connecting the major conurbations.'

This again highlights the inappropriateness of the original very narrow and premature remit for HS2 Ltd which has in practice prejudged a properly comprehensive strategic assessment of *inter alia* how best to connect London with the North of England. It is clear that a comprehensive national strategy for high speed rail has not yet been formulated.

The original remit for HS2 Ltd did however, as part of its 'future proofing' requirements, identify that the company should 'provide a costed option for passive provision for four tracks'. HS2 Ltd directors admitted in early bilateral discussions with the Chiltern Conservation Board and this Society that topography and cost ruled out any possibility of meeting that requirement on a cross-AONB route.

This begs the question as to whether there will be a future need for a second North- South HSR route to London in due course. This again highlights the basic error of promoting a 'discrete [HSR] project' in advance of a comprehensive national strategy.

These points reinforce the basic criticism of the HS2 Ltd approach, repeatedly stressed by this Society, the Right Lines Charter Group and many other respondents since the first round of HS2 public consultations, about the lack of a National Transportation Strategy context against which to judge the HS2 Ltd proposals.

It is claimed that the aim of the 2009/10 high level sustainability study was ' to ensure that the options were appraised on a consistent basis to identify whether there were any distinguishing environmental considerations that should be taken into account before any decision on the strategic route' (10.3.9).

It is apparent that this process failed to place proper weight on the 'distinguishing environmental considerations' and national importance of the Chilterns AONB as required by policy and law, particularly by ignoring to consider comprehensively an alternative option that did not cross the AONB, should Parliament decide that was not in the national interest.

Higher or lower design speeds

HS2 Ltd's preoccupation with designing a very high speed line (400kph) introduced a strong bias towards its recommended cross-AONB direct route. Paragraphs 10.3.12 – 10.3.14 only describe why even higher design line speeds and a new line at conventional line speeds were not considered further.

Volume 1 contains no attempt to justify the rejection of any scheme designs that might have utilised lower HSR design speeds to enable *inter alia* the Chilterns AONB to be avoided. The statement (10.3.18) that the Government concluded '… that 400kph is the appropriate maximum design speed for the line' is not justified on the basis of the work referred to.

Options for upgrading existing main lines

Other respondents, such as the 51M Group and HS2AA, with access to greater professional railways expertise than this Society are better placed to argue the technical aspects of the alternatives discussed in this section. However, the Society has the following observations:

Paragraph 10.3.26 confirms Government acceptance of a range of benefits from the 51m 'Optimised Alternative' and that 'some options may offer good value for money', but rejects it on the 'key consideration' that an extensive package of upgrades would not address demand, capacity and overcrowding in the long-term.

This conclusion is particularly influenced by the Government's perceived concerns about upgrades resulting in 'disruption to services over a long period' and its view that it this strategic approach would not end up 'avoiding the need for new lines'.

There are a number of worrying concerns about this Government line of thought:

- In the absence of a comprehensive national rail strategy, it is unclear whether some of the upgrading projects will in any case be required to meet other necessary future developments of the classic rail network.

- Throughout all the various consultation processes conducted by HS2 Ltd since 2009, it has been very evident that HS2 Ltd and DfT management thinking remains seriously influenced by the well-publicised and costly sad saga of the previous major WCML upgrade programme. One can understand this attitude to some extent, especially by those closely involved, but to allow such thinking to unduly influence the choice of alternative options for a project that will take 20 years to deliver is tantamount to admitting nothing has been learnt from previous bad experiences that would avoid previous mistakes in project managing future major rail projects. It hardly reflects the urgency for addressing the serious weaknesses in transport planning and project management addressed by the Eddington and McNaulty reports

- HS2 Ltd and the Government have not seriously considered a strategy of providing capacity upgrades on the classic rail lines between London and Birmingham to allow greater time to more comprehensively evaluate longer term alternative HSR options which were not subjected to the narrow constraints of the HS2 Ltd remit. Such options should include alternative HSR routes that did not involve crossing the Chilterns AONB.

Route-wide alternatives

The previous paragraphs note that, whilst apparently accepting the range of benefits arising from the upgrades proposed by the 51m Group in their 'Optimised Alternative', HS2 Ltd and the Government have consistently rejected any consideration of an upgrade based strategy on the belief that only a new line will satisfy future need in the long term.

This rigid position was no doubt reinforced by the Government's original objective to complete the HS2 approval process by the end of the current Parliament (now almost certainly unachievable).

The 51m upgrade proposals have clearly demonstrated that the presumed urgency to build HS2 that led the previous Government to launch its HS2 project on such a strategically limited remit was unnecessary and unjustified. However, the Government has steadfastly refused to consider all calls to delay further work on the current HS2 proposal in order to re-examine comprehensively alternatives not, or only superficially, assessed previously.

- Such a strategy would enable the impact of other proposals that could have an important bearing on the timing, capacity and need for any future North-South HSR route to be properly evaluated. Such proposals would include, for example:

- The extension of Crossrail from Old Oak Common onto the WCML to provide commuters from Milton Keynes and other WCML points with through services to the City and other stations along the Crossrail route. (HS2 Ltd admits (10.4.2) that, even with an interchange from HS2, access to Crossrail at Old Oak Common offers 'a faster alternative to Euston for passengers to the West End, the City, Canary Wharf and destinations in East London and Essex'). This Crossrail extension project would ease congestion at Euston as well as provide a connection from WCML to Heathrow and GWML via Old Oak Common.

- Examination of the importance for the Crossrail 2 proposal to be delivered 'no later than the completion' of HS2 Phase 2, which Lord Adonis and others claim HS2 makes 'essential' in order to alleviate 'unmanageable levels of' passenger congestion at Euston 'by the late 2020s'.

- Now that it is proposed to tunnel HS2 between Old Oak Common and Northolt, the potential for operating some Chiltern Mainline services on the existing classic rail alignment to the proposed conventional rail station at Old Oak Common, with onward services to Paddington.

- Thorough examination of alternative options for providing a multi-track HSR link between HS1 and any eventual HSR route to the Midlands and North to meet future demands for international and cross-London HSR services, thus avoiding the currently proposed highly capacity restricted HS2-HS1 link proposed by HS2 Ltd.

It is evident that the commissioning of HS2 Ltd in 2009, with its highly restrictive objectives and remit, effectively pre-empted the systematic assessment and development of a national rail strategy that would have considered such issues in a more logical and coherent manner. Such a holistic approach would also have enabled the proper weight to have been placed on protecting designated national assets such as the Chilterns AONB.

Direct access to Heathrow

The politically perceived notion that it was an 'absolute requirement' and priority to route the UK's North-South HSR route to the west of London to serve Heathrow introduced a major distortion into the strategic assessment of what was essentially an inter-city HSR proposal.

At that time (2009), it was firm Government policy to develop a third runway at Heathrow (subsequently rejected by the Coalition Government). Faced with a host of uncertainties, the Coalition Government delayed any decision on directly linking HS2 to Heathrow until HS2

Phase 2 had been evaluated. It also decided to delay progressing additional runway proposals in the south east of England pending a thorough review by the newly established Davies Commission. At the same time the Government and HS2 have both recently placed less emphasis on the need for high speed as a key driver for HS2.

There is, therefore, a very strong case for ceasing work on the current HS2 Phase 1 project and instigating a proper comprehensive strategic review of alternatives for improving rail capacity and connectivity, including HSR options, between the north and south of the country. That would enable the opportunity for comprehensive evaluation of a non-AONB alignment to be fully assessed – the absence of which should be a central factor in the proper assessment of the HS2 Environmental Statement.

The logic of conducting such a comprehensive review on a timescale that enables the outcome of the Davies Commission's remit to be taken into account is, in our view, incontestable.

Routes from London to the West Midlands

This section of Volume1 starts with two totally misleading statements.

First, the assertion (10.4.26) that 'Consideration of the effects on the Chilterns AONB was particularly important in this [options assessment] process' is a gross exaggeration. HS2 Ltd failed to give proper consideration to the Chilterns AONB. They basically compared the relative environmental issues for each route examined against the perceived impact on the overall project cost.

Second, the statement (10.4.25) that the option routes selected, where possible, '… followed the main transport corridors whilst avoiding … environmentally sensible locations'. The A413 is hardly a main transport corridor across the Chilterns (compared to the M40 or the A41), even when account is taken also of the nearby lightly trafficked Chiltern railway line. None of these are in the same league as the M20 corridor adjacent to HS1, and the multi-mode M1 transport corridor.

The introductory paragraph to 10.4.26 describes how six main route option corridors were considered for routes 'to the North of Old Oak Common'. This reveals that at this very early stage of the process HS2 Ltd had already decided that a west London terminus at Old Oak Common was a fixed requirement. It was their chosen solution for meeting the 'absolute requirement' for a link to Heathrow, albeit that that did not fully meet their remit requirement for a 'Heathrow international station'.

The section further describes why Routes 4, 5 and 6 (respectively WCML corridor, M1 corridor and MML corridor) were ruled out at a very early stage in 2009. It is revealing to note that in each case the perceived difficulties and cost of connecting to Heathrow was clearly a critical factor in rejecting those options.

A further critical factor was the considerably greater extent of tunnelling that would be required for these options than for HS2 Ltd's recommended route, as it was conceived at that time.

However, these summaries totally ignore the fact that the extent of tunnelling on the currently proposed route was subsequently substantially increased by the additional tunnelling of the proposed the HS1/HS2 link and the tunnelling of the route section from Old Oak Common to Northolt. This factor alone suggests that the costs and benefits of these options, and variations on them (particularly route schemes that would avoid the Chilterns AONB), should now be comprehensively reassessed.

For the collective arguments set out in this response, the Chiltern Society has to conclude that the summary of the Government's conclusion (10.4 31) that 'The proposed route corridor … is the best option for a new high speed line between London and the West Midlands ' is not only highly premature but also fundamentally flawed.

HS1 – HS2 link

In the Key Points set out in our response to the non-technical summary we point out that the 'absolute requirement' for HS2 to serve a Heathrow international station on a new line between West London and the West Midlands, not only effectively precluded options that did not cross the Chilterns AONB, but also precluded a full unrestricted strategic assessment of the best means to provide a multi-track HSR link between HS1 and the Midlands/North.

These initial highly constraining restrictions resulted in a recommended scheme that includes only a single track, very low capacity/low speed HS2/HS1 link that is partly shared with conventional suburban rail services.

Surely, had a comprehensive national rail strategy been conducted prior to the premature launching of the HS2 project in 2009, an 'absolute requirement' for future proofing purposes would have been to require the provision of a multi-track HSR link from HS1 to the North/Midlands capable of meeting future demands for passenger and light parcels HSR services between the continent and points north of London?

Such a route would also be expected to meet the demand for domestic HSR services from the south of London (e.g. Kent Gateway towns) to conurbations north of London.

In contrast, 'the proposed scheme includes a rail link with a capacity of up to [only] three trains an hour' (10.4.52), compared to the total capacity of up to 18 trains an hour in each direction between West London and the West Midlands (but without any intermediate stations). This does not seem to match up very well with the Government's view (10.4.53) that 'Connecting any UK high speed line to this rapidly growing [European HSR] network will be *vital* if the UK is not to become isolated from what is already a key mode of travel between major European cities'. *(Our italics).*

CFA 7 – Colne Valley

2 - Overview

2.2.7 states that: the Proposed Scheme will continue on a:

- *a viaduct approximately 3.4km long, starting approximately 190m west of Harvil Road and which will vary between 11m to 15m above the ground/water level. The viaduct will have a solid 1.4m high protection barrier adjacent to the tracks on each side. For the remainder of the western side of the viaduct there will be a 3m high noise fence barrier alongside the 1.4m high protection barrier.*

This makes no mention of the overall height. Presumably the height quoted is to the track bed and to this must be added the noise barriers and overhead gantries meaning that the overall height will be substantially higher.

2.3.25 states that it will be necessary to install piled foundations within the Source Protection Zone1 and that *'therefore a piling method **will be chosen** to mitigate contamination of ground water.'* This indicates the unnecessarily rushed timetable to prepare this Environmental Statement and is one of many examples throughout the entire document of missing detail and vague wording. The viaduct represents a major intrusion into the Colne Valley Park and its environment and it is unreasonable and unfair to expect people to comment - in this their last chance for public involvement - without important details being made available to them.

2.3.31 states that: *Alternative routes for four PRoW will be required:*

- *a temporary alternative route for Bridleway DEN/3 to the south of its existing alignment via A412 Denham Way/North Orbital Road, DEN/P and Tilehouse Lane **for a period of approximately three years and six months, adding an additional 1km.** It will then be permanently diverted approximately 150m to the south, adding an additional 270m to allow provision for the future construction of the Heathrow spur without any impact to this PRoW;*
- *a temporary alternative route for Bridleway DEN/2, 500m to the south of its existing alignment along the boundary of Juniper Wood **for a period of approximately five years and six months, adding an additional 1.2km.** It will then be permanently reinstated along the original alignment;*
- ***temporary closure of Bridleway CSP/44 for a period of approximately five years and six months.** It will then be permanently reinstated along the original alignment; and*
- ***temporary closure of Bridleway Rickmansworth 004 which currently runs east/west to the north of Tilehouse Lane for a period of five years and six months.** It will then be permanently reinstated 250m to the south across the new Tilehouse Lane overbridge, adding an additional 400m.*

The temporary stoppage of paths and lengthy diversions (if any diversion at all) will have a massive negative impact on the ability of people to use the network of footpaths and bridleways in the Park. Some of these paths that are being stopped up act as key links within the rights of way network and connect up many publicly accessible green spaces.

2.3.58 is a further example of lack of detail and explanation. This says that the compound for the Chiltern Tunnel South portal will be used to manufacture the concrete ring segments for the tunnel linings. This sounds a very significant operation, but there are no details about

what it entails. Just what are the environmental considerations and proposed mitigations for this enormous operation?

2.4.6 exemplifies further vagueness with respect to maintenance. We are told there will be routine preventative maintenance, including grinding and milling of rails (a very noisy practice) and ***'more periodic'*** heavy maintenance as necessary. All this will take place ***'at night'.*** Again, there are no details of the frequency, duration and level of noise and lighting expected. Without such detail it is difficult, if not meaningless, to make worthwhile comment.

3 - Agriculture, forestry and soils

3.4.9 states that: *During the construction phase, the total area of agricultural land used will be approximately 251.8ha as shown in Table 6. Of this total, 121.5ha will be restored and available for agricultural use following construction.*
The assumption that agricultural land will be restored to pre-existing quality and will be handed back to the original owner does not take into account the impact the scheme will have on the future ability for the land to be farmed. Negative factors that do not appear to have been considered include:

- The lack of continuity of farming activity
- farmland is rarely as good once 'restored'
- the fields will be much smaller and divided by railway, access roads, balancing ponds, cuttings and embankments, new watercourses and therefore less practical and less economically viable for farming

These factors are more significant in the urban fringe of the Colne Valley because there are many more pressures on land (because of its proximity to London) than in more rural areas.

3.4.27 demonstrates further examples of vague and subjective assessments from which it is impossible to draw meaningful conclusions. Land requirement bringing ***'an impact of medium magnitude'***, loss of forestry amounting to a ***'minor adverse'*** effect. Not only are these unspecific but are entirely the opinion of the HS2 assessor who, inevitably, will seek to play down the impact.

5 - Community

5.4.2 tells us that access for walkers, cyclists and horse-rider through and around construction compounds will be maintained ***'where reasonably practicable',*** without explanation of who will judge whether a course of action is reasonably practicable and what criteria he or she will use to make that judgement.

5.4.4 warns that residents of Swakeleys Road will suffer from ***'significant effects on air quality and noise'*** during construction which will have a ***'major adverse effect'*** on their quality of life. Other residential areas nearby will suffer the same fate. No attempt seems to have been made to look for alternative arrangements for construction and no mitigation measures are suggested.

5.4.5 The Chiltern Society supports the views of Hillingdon Outdoor Activity Centre (HOAC) and its supporters fighting to save the centre which provides outdoor education for all but with priority given to young people and those who are disadvantaged or disabled. It would not be able to operate during construction and it must be doubtful if it would survive

thereafter. The Colne Valley viaduct passes right over the centre and across the middle of the lake. Apart from the visible impact on the centre, the presence of such a large structure will inevitably affect the wind patterns impacting upon the sailing activities. As stated in the ES, there are no other centres providing similar services in neighbouring local authority areas. Its loss would be a massive blow for all those that currently use the facilities. The Society feels the Government has an obligation to the hundreds of its users, young and old, to save the centre and/or give it greater protection or assist with a suitable relocation.

5.4.16 states that: *The construction works are predicted to result in a change in amenity for users of Denham Water ski Club through a combination of effects. The in-combination effects are significant noise effects at the club house and significant visual effects associated with views south, west and north from the club of the construction activity. The clubhouse is used for instruction and tuition, as well as being the focus for events and therefore changes to this environment are considered to affect the club. The effects are likely to coincide for a period of approximately one and a half years.* ***The combination of these effects is considered to result in a moderate adverse effect and is therefore significant.***
The impact on Denham Water Ski club will be huge as it is unlikely that they would be able to operate during the construction phase. In the longer term, the site would be changed forever. The loss of trees would remove the barrier to the North Orbital Road and expose users to traffic noise and wind. This would be in addition to the noise of the trains and potential vibration due to the viaduct's close proximity to the Clubhouse as well as the visual aspect. The Proposed Scheme would change the current woodland character of the site permanently, There would be a major financial effect on the club, both short and long term through the loss of goodwill during the construction phase and it must be doubtful that the Club could survive.

5.4.18 states that: it is ***'considered'*** that the Colne Valley Regional Park is large enough to absorb the construction of HS2 and retain its function. This is a serious misinterpretation. Regular users of the park already see a park under stress, affected by noise and pollution from the M40/M25/A40. The park retains its popularity, attracting thousands of visitors, mainly from nearby London boroughs, and has to be creative in coping with such numbers while retaining a countryside feel. HS2 will impose a new, intolerable strain on the park. Currently, the park remains a significant outdoor barrier between the Metropolis and the Chilterns AONB. In our opinion, HS2, particularly in the construction period, will erode that barrier to the extent that the Park's effectiveness as a major outdoor recreational area is will be seriously undermined.

7 - Ecology

7.3.2 lists the considerable number of locations where HS2 ecology consultants were not permitted access to conduct a Phase 1 habitat survey and 7.3.12 lists areas of woodland, including ancient woodland, many of which are described as habitats of principal importance. Ecological studies in sensitive areas such as this usually take many months to complete, assuming that full access is granted. The only conclusion we can draw from this section therefore, is that the assumptions are at best inadequate and at worse incorrect.

7.4.4. concedes that there will be a loss of breeding bird habitat which will result in a decline for a number of breeding birds of various species in the Mid Colne-Valley SSSI and the combined effects of woodland and wetland loss will result in what is described as a ***'permanent adverse impact'*** on the integrity of the SSSI, which in turn is described as ***'significant'*** at a national level.

7.4.13 notes that: more than half of the Denham Country Park Nature Reserve is required for construction of the proposed scheme. Other nature reserves in the area will also be impacted. Sections 7.4.25 to 7.4.34 contain a depressing list of bird habitat and other wildlife and plant life that will be adversely affected, including the risk of extinction of the coralroot when its main woodland habitats - the ancient woodlands of Ranston Covert and Battlesford Wood are removed. Britain cannot afford to keep eroding increasing rare and precious habitats. A report by the RSPB in 2012 stated that a fifth of British birds had disappeared in the last 50 years, primarily because of the loss of habitat. If this disastrous proposed route is to be accepted the Government must insist that these habitats be protected.

9 - Landscape and visual assessment

The landscape character areas (LCAs) within CFA 7 are not of the special quality in the Chilterns AONB but do, in combination, create a significant green lung between the edge of London and the AONB. They are well used by walkers, cyclists and horse riders and provide areas of tranquillity even though they are crossed by busy roads and existing rail lines.
We believe that there is a confused methodology for assessing visual impacts, as well as misleading photomontages taken from selective viewpoints.

9.5.4 to 9.5.29 describes the range of disruption to the landscape and the tranquility that HS2 consultants believe will occur in the Harefield Farmland Valley Slopes LCA; the Colne River Valley LCA; the Colne Valley LCA; and the Maple Cross Slopes South LCA. They are mainly assessed as *'moderate'* and *'medium'* adverse effect, with on *'major'* adverse effect on the landscape in the Colne River Valley LCA. We believe this to be a gross underestimation.

12 - Traffic and transport

Traffic and transport is a very complex part of the ES. As with the rest of the report, there are constant references to other publications some of which were not to hand and others had parts missing or contained very misleading information. This led to much wasted time and effort trying to find the required information. Other aspects of concern regarding Traffic and Transport are covered in our response to Volume 5 Technical Appendices Transport Assessment.

There is no doubt that construction traffic will add considerably to the levels of traffic on Motorways and main roads as well as local roads throughout the area. There could be up to 980 HGV two way trips and up to 580 car/LGV two way trips per day. In addition there will be 102 Car/LGV and 9 HGV two way trips from CFAs 8,9/10 and 460 HGV from CFA6 which will impact on this area. As has already been pointed out, further analysis is impossible because of the errors in the report. There can be no doubt however that the impact for the users of the A412/North Orbital Road will be major adverse and extremely significant for those who are just trying to go about their normal everyday business. Many will be affected by the delays and others will be out of pocket through having to find an alternative route. Yet another hidden cost of HS2!

Conclusion

Traffic congestion is already a major imposition in this part of South Buckinghamshire. The stretch of the M25 between the M4 and the M40 is the busiest road in Britain, carrying an average 196,000 vehicles a day (source Roadsuk.com).

When the M25 suffers its regular gridlock, some motorists leave the motorway to seek alternative routes via local roads, thus adding to local congestion.

The imposition of such a vast amount of additional construction traffic, outlined above, over many years will place an unsustainable load on the local road network. In our view:

- It will mean increased congestion on motorways, A roads, B roads and local roads over a wide area. It will lead to longer journeys for emergency vehicles, public transport and school transport as well as private cars.
- It will lead to greater risks, particularly involving vehicles travelling to Heathrow to catch flights, and it will increase air pollution in the immediate area.
- It will mean increased delays for business traffic and those travelling to work, bringing incalculable costs to industry

In addition, the assumption (12.4.5) that HS2 workers starting work at 8am and leaving at 6pm and therefore *"arriving before the morning peak hour and leaving after the evening peak hour"* is woefully inaccurate (see our detailed response on rush hours in CFA 10). The morning peak period in this part of South Bucks runs between 7.30am and 9.30 am and the evening peak builds up from 4.00pm with school traffic until 6.30pm as any local motorist will confirm.

In our view the traffic calculations in the ES are weak and do not take into account the current conditions. That together with the quite obviously incorrect data makes it imperative that detailed and comprehensive traffic study must be made before the Second Reading.
(See Vol.5 TR 001-000 Table 7-3)

13 - Water resources and flood risk assessment

Draft ES 13.5.12 states that: "*site compounds for .....the south portal of the Chiltern Tunnel are both located in areas classified by the BGS as having a* ***'very high' susceptibility to groundwater flooding*****".**

This potential risk has disappeared from the final Environmental Statement, although it is noted that 225 workers, rising to a maximum of 310 workers per day, could be on site at this compound location, which will be active and therefore at risk of flooding for up to eight years.

13.2.6 states that: *the tunnelling methodology is yet to be decided and it is* ***'assumed'*** *that it will be a closed system and that the tunnel lining will be constructed such that leakage will be kept to a minimum.* Given that it is admitted elsewhere in this document (section 13.3.5) that groundwater flow through the chalk is largely through 'fissure' (joints and fractures), it seems a gross omission that only a desk based (section 13.3.15) assessment has been made of the density of such joints and fractures in this area and that there is no borehole data to support this. A more detailed study is recommended in order to allow for the tunnel design to be drawn up with procedures in place to mitigate calculated ground water flow along known fracture and joint systems rather than being based on assumptions.

It is widely recognised that this section of the proposed route is through the Seaford Chalk Formation, noted throughout for its regular distribution of flint bands, many of these being semi-continuous tabular flints. No detailed borehole logs exist along this part of the proposed route as yet, which would indicate the precise location of such flint bands and yet these flint

levels are known from other chalk tunnelling projects to be points of major ground water flow. This characteristic of the chalk of this section to be tunnelled is not considered anywhere in the Environmental Statement.

13.3.23 states that *Gravel deposits form a shallow aquifer across the valley floor and the lakes occur where these gravels have been excavated. Groundwater levels in the gravels mirror those in the lakes. Any potential wide scale changes to the groundwater levels and quality in the gravels* ***may therefore impact surface water quality and levels*** *and vice versa*.
Exactly what does *'may'* mean in this context and what are the implications?

13.3.24 states that: *vertical groundwater flow is generally restricted by a layer of weathered Chalk at the surface of the Chalk and some thin layers of finer material in the superficial deposits. However, the lower permeability layers are not consistent across the valley either in thickness or presence. Therefore in places the Chalk aquifer is vulnerable to contamination from the gravels and lakes due to the potential hydraulic continuity that is present.*
Exactly what are the implications of this statement?

13.4.4 states that: *the detailed design of the realignments* ***will be*** *completed in consultation with the Environment Agency to meet their objectives with respect to hydraulic capacity, flood risk, ecology and hydromorphology. Where* ***reasonably practicable****, the permanent channel realignments will be constructed in advance of other activities associated with the viaduct construction.*
The term *will be* is not good enough in the context of a final ES. *Where reasonably practicable,* is not specific enough. Will it happen or won't it and on what criteria is the term based?

13.4.5 states that: *drainage, including that from access roads and hard standings, will discharge, where* ***reasonably practicable,*** *to sustainable drainage systems (SuDS) balancing ponds, prior to subsequent discharge to watercourses or if necessary to sewer.*
Again the statement that this will only happen if *reasonably practicable* is not good enough. We need to know that it will happen regardless of whether or not it is reasonably practicable.

13.4.22 states that: *specific monitoring to determine the potential impact toPublic Water Supply (PWS) (Affinity Water) and private abstractions will be undertaken. The monitoring schedule* ***(to be agreed with the Environment Agency and in consultation with Affinity Water)*** *will include monitoring before, during and after construction until the groundwater quality has stabilised within acceptable limits. The monitoring data will be assessed and used to define appropriate mitigation, should it be required.*
Local authorities must be involved in such discussion.

13.4.30 states that: *the Proposed Scheme includes 35 pier footings to be constructed within different sections of the Mid Colne Valley lakes including Savay Lake and, within the SSSI at Long Pond. A temporary jetty will be provided along the route and coffer dams will be constructed around each pier footing. These structures will not affect the hydrology of the lakes since the overall surface areas affected by the Proposed Scheme are small in relation to the area of each lake. The potential impacts on water quality in some individual lakes* ***could*** *lead to a risk of a significant adverse effect.*
The use of the word '*could'* is unsatisfactory when used in connection with a potentially significant adverse effect.

13.4.31 states that: *tunnelling, piling and retaining wall construction could have the potential to impact on groundwater quality due to the migration of fluids or suspended bedrock particles giving rise to raised turbidity. At the scale of the classified Mid Chilterns Chalk groundwater body any turbid groundwater will be attenuated within the Chalk and diluted in regional flow and the overall impact on*

the groundwater body as a whole is deemed to be negligible which for this high value receptor would be a neutral effect and therefore ***not significant****.*
In common with many themes, the basis on which HS2 remove the 'significance' of an issue is not robustly demonstrated. These remain real risks to the local water resources and environment.

13.4.32 states that: *the impact of any change in groundwater quality in the wider groundwater body on surface water and water dependent habitats will be* ***negligible.*** *Surface water features and associated water dependent habitats in the area are of high value leading to a neutral effect.*
What does 'negligible' mean in this context.

13.4.33 states that: *although effects on wider water body receptors are considered to be neutral,* ***if*** *fissures connect the working area of the Proposed Scheme directly to very high value receptors such as PWS, the impact of even low levels of turbidity could cause the closure of a source due to the high quality required to be met for potable use. This risk is especially the case where the Colne Valley viaduct piers are sited within the areas designated SPZ1 TH177 and SPZ1 TH174 and where the SPZ1 TH027 will be intercepted by the retaining walls for the Tilehouse Lane cutting.* ***If*** *a PWS was forced to shut down this would be a major impact and will therefore result in a significant adverse effect.*
The use of the word *'if'* (twice) in connection with a potentially major impact resulting in a significant adverse effect is much too vague.

13.4.34 states that: *in addition, there is potential to impact groundwater quality at high value receptors such as PWS in this study area that may result from construction of the Proposed Scheme in the neighbouring CFA8, such as the Chiltern tunnel. This is because the direction of groundwater flow is from west to east and south-east from CFA8 into this area. As such,* ***there is a risk*** *that there could be an adverse effect on the PWS in this study area resulting from tunnelling activities in CFA8.*

13.4.36 states that: *the source protected by SPZ TH171 is much closer to and directly down gradient of the Proposed Scheme (Chiltern tunnel) in CFA8 than TH027 and TH177.* ***As a result of this proximity the risk of turbid water entering this abstraction point i****s greater than for those protected by SPZ TH027 and TH177 and hence would result in a major impact that would be a significant effect.*
The admission that *there is a risk* to the public water supply should not be dismissed so lightly. What exactly is the scale of this risk?

13.4.37 states that: *a temporary jetty will be constructed across the River Colne and floodplain for construction of the viaduct. The deck and supporting structure of the jetty will be designed to take account of the potential for increased flood risk through measures to be incorporated within a site-specific flood risk management plan, as described in 'Other mitigation'.* ***There remains the potential*** *for the jetty to obstruct some flood flows temporarily during the construction works resulting in moderate impacts on flood risk to very high value receptors with a resulting large and significant adverse effect.*
The phrase *there remains the potential* in connection with an impact with significant adverse effect is just not specific enough. What is the likelihood of this flood risk taking place?

13.4.43 states that: *the foundation piling is* ***likely*** *to disrupt groundwater flow. If significant flow horizons within the Chalk are obstructed this could lead to a reduction in flow to PWS abstractions that are particularly close to the route. The source protected by TH177 is located approximately 25m north-east of the route.* ***It is predicted*** *that the drawdown of groundwater levels at the source* ***is likely*** *to increase or there* ***could be*** *a reduction in yield by the same proportion. This potential additional drawdown or decline in yield* ***could give rise*** *to a major impact on the operation of this very high value receptor, particularly during times of drought. This would then be a very large and significant effect.*

The use of vague terms such as *likely, it is predicted, could be and could give rise* is again totally unacceptable in connection with a major impact with a very large and significant effect. It is not satisfactory to risk such receptors without additional planning. Once impacted it is almost impossible to implement corrective actions.

13.4.48 states that: *in respect of PWS, HS2 Ltd **will agree a management strategy** with the Environment Agency in consultation with Affinity Water that will cover timing of any physical mitigation, the scale and nature of monitoring and the thresholds at which actions are invoked (in terms of both quality and flow) the nature of other intervention measures and the responsibilities for ensuring agreed actions occur*.
We were promised full and final details in the ES and so, at this stage, surely the phrase *will agree* should be *have agreed*.

13.4.49 states that: *the private abstraction at Tilehouse Lane may be used for drinking water and further mitigation **is likely** to comprise the provision of an alternative water supply or other appropriate compensation for loss of the borehole.*
Yet again a specific commitment is required instead of a vague *is likely*.

13.4.53 states that: *tunnelling and other construction below the water table **has the potential** to impact on groundwater quality. **If** fissures connect the working area of the Proposed Scheme directly to the Affinity Water groundwater abstraction which is protected by SPZ TH171, the impact of low levels of turbidity will be major due to the high quality required to be met for potable use, resulting in a large and significant temporary adverse effect during the construction works.*
Again, vague terms such as *has the potential* and *if* are just got good enough in connection with a major impact resulting in a large and significant temporary adverse effect is just not acceptable.

13.4.54 states that: *piling for the viaduct piers **could disturb** the groundwater flow regime to the Affinity Water groundwater abstraction protected by source protections zones referenced as TH177. Flow horizons to the abstraction **are likely** to be penetrated and obstructed and as a result there **could be** a permanent reduction in yield at the source, resulting in a very large and significant effect which could occur during construction works.*
Non-specific terms such as *could disturb, are likely* and *could be* are not acceptable when used in connection with an impact leading to a very large and significant effect.

13.4.55 states that: ***until a management strategy is agreed** with the Environment Agency in consultation with Affinity Water, one potentially significant temporary residual effect and one potentially permanent adverse effect on the Affinity Water groundwater abstractions remain.*
At this stage it is unacceptable that a management strategy has still to be agreed when it was promised that the ES would be a final document containing all relevant information.

13.4.56 states that: ***until design of the temporary jetty is complete** and the site specific flood risk management plan is agreed with the Environment Agency, a potentially significant temporary residual effect on the risk of fluvial flooding remains. During construction works flood conveyance capacity will be reduced by the presence of a temporary jetty across the River Colne resulting in a moderate impact on very high value receptors and a large and significant effect.*
It defies belief that at this late stage, a design for the temporary jetty is still not complete.

Conclusion

The above statements identify a number of risks to the PWS. As the Colne Valley catchment supplies 22% of London's water supply, the mitigation methods to be used for each risk should be clearly identified and quantified.

CFA 8 – The Chalfonts and Amersham

2 – Overview

There are concerns that conclusions are reached based on hydrological surveys having been carried out yet there is no evidence that any such surveys have taken place. Monitoring of water flow and pollution is listed as a mitigation measure before any necessary remedial action. This is not mitigation as the damage would have been done and not avoided. It must be remembered that this could have a dramatic effect on the public water supply as well as the River Misbourne and Shardeloes Lake.

Chalfont St Peter vent shaft

2.2.7 describes the arrangements for emergency access and egress to and from the tunnel at the Chalfont St Peter vent shaft. Similar facilities are discussed at the other vent shafts along the route. However no mention is made anywhere in the Environmental Statement about the cost to the emergency services of providing and maintaining the equipment and training needed for such specialised rescue services. These costs and needs should be assessed for the entire HS2 project and included in the cost estimates.

Chalfont St Giles vent shaft satellite compound

2.3.34 states that there will be permanent widening of Bottom House Farm Lane whereas 2.3.38 says the Lane will be closed temporarily and local access maintained by a temporary traffic route *if needed (our italics).* 2.3.37 however states that no road realignment is required in the Lane. These statements are confusing and seemingly contradictory. When would the need for a temporary traffic route be decided? This is vital for the residents of Bottom House Farm Lane as well as the business users and must be included in the ES.

2.3.37 states that: *In this area there will be no road realignments,* ***no alternative routes for PRoW,*** *and no watercourse diversions required.*
All PRoWs in this area appear to have been ignored completely. **CG30/A16 (the *'promoted'* South Bucks Way) is not shown on map CT-05-026** and there is no mention of a diversion during closure of Bottom House Farm Lane. CG28 and A18 are shown on the map without being labelled. No closure or diversion is mentioned but both paths will obviously be seriously impacted by the destruction of the manége attached to Chalfont Valley Equestrian and construction of the Chalfont St. Giles vent shaft.

2.3.39 concerns the installation of four new utilities in the area of the Chalfont St Giles vent shaft compound. No mention is made of the need to strengthen the existing bridge over the River Misbourne in Bottom House Farm Lane. In view of the increased amount of traffic and heavy vehicles that will be using this lane during the construction has such a measure been considered?

These are examples of how the ES has not been properly completed.

Operation of proposed scheme

2.4.7 says that during the night-time period (midnight to 5am) maintenance staff will regularly access the tunnels via the vent shafts to carry out inspections and maintenance.

The work will include grinding and milling of rails and, periodically, "heavy" maintenance. This will inevitably generate noise - sometimes loud and consistent - and an element of light pollution which has the potential to seriously disturb residents living within the immediate area. There is no mention of measures proposed to combat this pollution. No mention is made of whether or not the vent shafts will be illuminated permanently.

Community forums

2.5.4 points out that concerns expressed at the Community Forums included that of noise from the vent shafts and the preference for their design to be sensitive to local settings. The ES makes no effort to address these concerns. Also it makes no mention of whether or not headhouses could be sited partially or completely below ground.

2.5.4 also refers to the concerns at the Community Forums over vibration impacts during tunnelling and when the service is operational with particular reference to Amersham Hospital, the Bottom House Lane equine centre, and the Chalfont St Peter Epilepsy Centre. The ES makes no effort to address these specific concerns.

2.5.4 refers to concerns at the Community Forums over traffic impacts from construction, given existing traffic congestion levels and road realignments and the fact there these could deter visitors and affect the local economy. These concerns remain. The ES makes light of these concerns and makes no effort to address them satisfactorily.

2.5.4 notes concerns at the Community Forums that the Metropolitan Line and Chiltern Rail lines would be affected during construction of the route, and road realignments could cut off access routes between Chesham and surrounding villages. No reassurances to meet these concerns are included in the ES and these concerns remain. These issues serve to confirm the views of many people in the area that the Community Forums were a sham, designed to allow local people to express their views and concerns but with no real intention of paying heed to these view or taking action to address them.

3 - Agriculture, forestry and soils - permanent effects

3.4.20 says that following the construction period there will be a permanent loss of six hectares of Best and Most Versatile (BMV) land, which is assessed as an impact of high magnitude. This is unacceptable in an area where BMV quality land is already at a premium.

3.4.21 concludes that the amount of forestry lost in this CFA area is "not significant" because "the proportion of forest cover as a land use in the study area is greater than the average national land use forest cover". This is a subjective view, to be expected from the proponents of the development. It fails to take into account that the area is AONB and, as such, should be given special consideration and protection as laid down in the National Parks and Access to the Countryside Act.
The loss of any forestry from such an area is not insignificant. Indeed, it is highly significant. This particularly relevant as the UK is one of the least forested countries in Europe.

3.4.23 states that Ashwells Farm and Upper Bottom House Farm will lose a fifth of its land and suffer the demolition of its manége respectively. This is described as a "moderate" permanent adverse effect. Again this is a subjective assessment by a proponent of a proposed development. To the businesses concerned, the impact is far more severe than "moderate".

5 - Community

5.4.1 describes measures proposed to mitigate community effects during the construction period. It states that where "reasonably practicable" there will be maintenance of Public Rights of Way, for instance, or that where "practicable" there will be an avoidance of large goods vehicles operating adjacent to schools. Who will decide whether or not these measures are practicable? The use of such terms is completely meaningless and offers no reassurance to local residents and parents. Firmer measures must be imposed before Parliament considers the Second Reading.

5.4.9 says the disruption due to nearby construction and increased traffic will have a "minor adverse effect" for "users" of the Chalfont Valley Equestrian Centre (disregarding the "major adverse effect" on the business because of the loss of its horse-exercising area, see below). This assessment fails to take into account the effect on the horses using the stables at the centre. The owner confirms that horses are susceptible to noise and disturbance. No recommendations are made to protect the business from the effects of noise and disturbance.

5.4.11 admits that the loss of the manége (exercise area for horses) will threaten the future viability of the Chalfont Valley Equestrian Centre, and further admits (5.4.13) that alternative centres nearby are not directly comparable. No attempt has been made to accommodate the manége within the Proposed Scheme.

6 - Cultural heritage

CFA 8 has a particularly high number of important heritage assets that will be affected by HS2 to varying degrees. Their presence in the area, and the magnificence of their setting, are important aspects in generating visitors and income to the area. Their existence contributed to the designation of AONB status to the area.

6.3.3 and 6.3.4 lists the following heritage assets within the ZTV (zones of theoretical visibility)

- Four grade I listed building of high value
- Twelve Grade II* listed buildings of high value
- 239 grade II buildings of moderate value
- Five conservation areas of moderate value and one of high value
- One grade II registered park and garden of moderate value
- 21 areas of ancient woodland of high value

According to 6.3.19 The Domesday Book contains entries for Amersham, Chalfont St Giles and Chalfont St Peter and 6.3.20 tells of evidence for medieval (AD 1066 to AD 1540) settlement is most likely to be found in proximity to the historic cores of the three settlements of Amersham (a medieval planned town), Chalfont St Giles and Chalfont St Peter.

6.3.21 mentions that medieval manorial sites have been identified at Shardeloes (CHA067) and The Vache (CHA025). Farmsteads with potential medieval origins have also been recognised at Ashwell's Farm (CHA017), Gellibrands (CHA007), Bowstridge Farm (CHA011), Coldharbour Farm (CHA0044), Woodrow Farm (CHA052) and probably at Lower Bottom House Farm (CHA031). Some of these may also represent former manorial sites.

The Chalfonts and Amersham area is rich with assets of historical significance. The construction of HS2 and its eventual permanent placement will have an impact on these supposedly protected properties and treasured area which the ES does little to quantify. In Volume 1, (9.1) HS2 asserts that its approach to mitigation in priority order is to Avoid; Reduce; Abate; Repair and Compensate. Without full assessments on these areas, it is not possible to assess how the impact could be reduced, abated, repaired or compensated. Thus, the only practical solution is to avoid the area altogether.

7 - Ecology

2.1.5 Figure 8 fails to show Shardeloes Lake.

7.2.3 states that: *It was not possible to access all of the land areas where general habitat surveys (Phase 1 habitat survey) were proposed.* ***Locations with the potential to support key ecological receptors where access could not be gained for survey include the River Misbourne upstream of Shardeloes Lake.***
7.3.5 states that: *Four Local Wildlife Sites (LWS) and a single Biological Notification Site (BNS) are relevant to the assessment in this area including :*

- *Shardeloes Lake LWS (15.4ha) – is designated for standing open water and wetland birds. Between 2003 and 2011, the site supported a diverse assemblage of wintering birds, including gadwall, green sandpiper, shoveler, snipe, teal, whooper swan and wigeon.*

The Chiltern tunnel will pass under the River Misbourne in two places, one at Chalfont St Giles and ***one upstream of Shardeloes Lake where field surveys recorded a natural channel with marshy margins and wet woodland.*** *Owing to its size, geomorphological characteristics and the rarity and distinctive assemblages of chalk stream species, the River Misbourne is of regional value.*
These statements contain contradictions. 7.2.3 states that it was not possible to access all of the land areas including *upstream of Shardeloes Lake* yet 7.3.5 states that: ..... *upstream of Shardeloes Lake where field surveys recorded a natural channel with marshy margins and wet woodland.* There is no evidence surveys have been undertaken yet 7.3.5 suggests they have. Which is correct?

7.3.20 Table 8: Records brown trout present but there is no mention of rainbow trout. The River Misbourne is one of only three rivers where they breed in the wild and so has national value. As the tunnel passes 20 metres below Shardeloes Lake, there is a danger that it would not survive as it sits on a low porous and permeable formation and disturbance of the structure as a groundwater pathway would impact on the lakes existence.
Figure 2 on page 8 fails to show Shardeloes Lake.

7.4.6 states that: *There is the potential for ground settlement and loss of flow from the river to the chalk aquifer due to possible fractures in the chalk, however, the risk of this is low and no likely significant water effects have been identified. Therefore any indirect impacts on ecology are unlikely.*
In the absence of hydrological surveys this is an unjustified assumption. The River Misbourne is one of the few precious Chalk Streams in the Chilterns. These are an internationally scarce and protected habitat and its loss would have a massive ecological impact.

8 - Land Quality

8.4.4 states that contaminated soils will be treated as necessary to remove or rendered inactive "wherever reasonably practicable" . This means that wherever it is not deemed to be

"reasonably practicable" contaminated soils will be left exposed and accessible. This is not acceptable.

9 - Landscape and visual assessment

The Misbourne Upper South Landscape Character Area (LCA) and the Penn South LCA (9.3.6 and 9.3.7) are both within the Chilterns AONB and, as the ES acknowledges, are highly sensitive to change. The conclusion (9.4.17 and 9.4.19) that the proposals constitute a "moderate adverse effect" is highly subjective and greatly disputed.

Natural England, the government's advisor on the natural environment, describes Areas of Outstanding Natural Beauty as areas of "high scenic quality (with) statutory protection…to conserve and enhance the natural beauty of its landscape."

Natural England's website further declares :"AONBs are designated *solely (our italics)* for their landscape qualities, for the purpose of conserving and enhancing their natural beauty, which includes landform and geology, plants and animals, landscape features and the rich history of human settlement over the centuries,

"They are designated under the provisions of the 1949 National Parks and Access to the Countryside Act, in order to secure their *permanent* (our italics) protection against development that would damage their special qualities, thus conserving a number of the finest landscapes in England for the nation's benefit."

The construction of a tunnel through these areas is, of course, a considerable mitigation. However, the *permanent* intrusions into these landscapes do not conserve or enhance their natural beauty. Indeed they are ugly scars that will considerably detract from the natural beauty. They include:

- A vent shaft headhouse and auto-transfomer station at Chalfont St Giles.
- A vent shaft headhouse at Bottom House Farm Lane
- A vent shaft headhouse at Amersham and
- A vent shaft and auto-transfomer station at Little Missenden in CFA 9, but clearly visible from CFA 8.

These headhouses and shafts will have associated access roads, security fencing and lighting, all of which will intrude on the landscape scene.

During construction large cranes will be visible and the "increase in construction plant and associated traffic levels will reduce tranquillity within the LCA" (9.4.18).

9.4.16 notes that *"cranes and temporary stockpiles on adjacent fields will introduce prominent new features within the rural landscape"* and adds *"the addition of prominent new features associated with construction works will bring about a noticeable change in landscape character…"*

9.5.2 lists the avoidance and mitigation measures proposed over the 60 years from the year of completion. It talks of screening and fresh planting; of new earthworks and of integrating land drainage areas into the landscape, even though balancing ponds are not a natural feature of the Chilterns landscape. 9.5.1 covers landscaped perimeters to the vent shafts.

These sort of landscape measures are run of the mill, the "bog-standard" sort of landscaping you would expect to find in any urban or semi-urban development.
Neither in tone nor wording does the ES take into consideration the unique and historic factors that make the Chilterns AONB so distinctive.

The responsibility of Government in its approach to AONBs is quite clear in the legislation. It must ensure that permanent protection is in place to protect against development that damages its special qualities. If it really is necessary to deface the Chilterns with this project, a detailed and specific plan - agreed with the AONB authorities and interested parties - must be in place before any construction begins.

10 - Socio-Economic

There is growing concern about the impact construction of the Proposed Scheme will have on the local economy and its ability to recover once the prolonged construction phase is complete. It must be borne in mind that, when eventually in service, HS2 will be of no benefit to the local community as the nearest accessible station will be the London terminus at Euston. Most people travelling to Birmingham now do so by road but there are already two excellent rail links via the West Coast Main Line via Watford Junction and the Chiltern Main Line via High Wycombe.
There is also concern that the present level of service on these lines would not be sustainable and that some services would be lost. In any case the number of platforms at Euston will be reduced from 18 to 13 meaning that existing services will have to be reduced significantly regardless of whether or not existing levels of service are sustainable.
The communities of Chalfont St. Peter, Chalfont St. Giles, Little Chalfont and Amersham, both the old market town and the newer town of Amersham on the Hill, are well served by local shops and businesses. Traders also rely on custom from further afield and there can be no doubt that the A413, the main route through the area, will suffer from increased congestion. The result of this could well be that people will avoid the area altogether and take their business elsewhere to an area not blighted by HS2.
The concern is that this will have an effect on the longer term viability of these businesses to the detriment of the local community.
The likelihood of congestion is also of concern to residents using Amersham Hospital which is in close proximity to the Amersham vent shaft as well as other medical facilities both locally and at High Wycombe and Stoke Mandeville hospitals.
The Chilterns Crematorium covers a large part of South Buckinghamshire and is very close to the Amersham vent shaft construction compound. It would be affected by traffic travelling to and from the numerous compounds using the A413. The congestion and possible delays would be particularly distressing to mourners at a time of stress. This has not been considered in the ES.
The Amersham bypass will be badly affected but for most journeys through the area is difficult to avoid. The area has a wide range of diverse small to medium sized manufacturing businesses with specialist, highly skilled staff. It is also home to GE Healthcare which is one of the largest employers in the area.

There are many schools in the area and because of the choices within the educational system, many children travel some distance to their school of choice. A large proportion of this traffic uses the badly affected A413. This again has not been considered in the ES.

11 - Sound, noise and vibration

11.3.12 states that vibration from Tunnel Boring Machines present no risk of any building damage. In other parts of the Society's response we refer to the uncertainties of tunnelling through a chalk aquifer and of the great age of some of the buildings likely to be impacted by HS2, particularly in Chalfont St Giles. For understandable reasons a number of property owners did not permit HS2 engineers to take baseline sound level monitoring at their premises (11.3.5). In view of these limitations, how certain can HS2 be that vibrations will not present any risk and what further measures can be taken to reassure a sceptical public? There is 16m of rubble chalk below Chalfont St Giles leaving only 6m of solid chalk above the top of the tunnel. Rubble chalk has a high risk of settlement and an alternative alignment should be considered. At a meeting with the Society, HS2 consultants agreed that there was a risk of settlement.

12 - Traffic and transport

The main impact on the communities during construction of the Proposed Scheme within this area will come from the increased levels of traffic it will put onto local roads.

The Chalfont St Peter vent shaft compound

This will be accessed via Chesham Lane, Denham Lane and Joiners Lane on to the A413 then the A40 and M40. These are minor local roads and according to Tables 7-24/25 (Volume 5 Appendix Transport and Traffic Assessment) had levels of traffic ranging from 72 to 275 vehicles during the AM peak with just one HGV travelling southbound along Chesham Lane/Denham Lane. Figures for the evening peak along the same roads are between 120 and 409 vehicles with just two HGVs westbound on Joiners Lane and just one eastbound and northbound along Chesham Lane/Denham Lane. Construction traffic will add up to 100 cars/LGVs to these figures. For northbound traffic on Chesham Lane/Denham Lane this represents an increase in the region of 75% during the busy period of construction. There will also be between 10 and 20 HGV two way trips during this period. As only one HGV was recorded during the peak period, we can assume that this number of vehicles constitutes a huge increase in traffic and will have a major adverse impact on these roads and the effect will be very significant.

Chalfont St Giles Vent shaft compound

This will be accessed via Bottom House Farm Lane then on to the A413, A40 and M40 to the west and A413, A355, A40 and M40 from the east. Bottom House Farm Lane is a single track winding rural road used mainly by residents, light commercial traffic associated with Upper Bottom House Farm and users of the riding stables. A maximum of two vehicles are shown Tables 7-24/25 (Volume 5 Appendix Transport and Traffic Assessment) during both AM and PM peak periods. During the busy period of construction up to 100 cars/LGVs will use this route each morning and evening. There will also be up to 40 HGV two way trips (80 vehicle movements). As previously stated, it is not clear exactly what measures will be taken to accommodate this massive increase in traffic and to maintain access for residents and for

existing traffic. This is a very serious shortcoming as far as the ES is concerned and causes serious concern.
Traffic from the east entering Bottom House Farm Lane and traffic travelling west leaving Bottom House Lane will all have to turn right across the busy A413. The access to the A413 slopes steeply backwards. Together, these substantially increase the possibility of accidents especially during the peak periods.
No mention is made of the possible need to strengthen the bridge over the River Misbourne in order to support heavy construction traffic.
If Bottom House Farm Lane is widened and straightened permanently, there is likelihood that it would then become an alternative route for drivers seeking to avoid congestion on the A413. This would change the traffic flows dramatically as well as having an impact on an otherwise tranquil setting. There is a potential for a permanent adverse effect that would be significant.

Amersham Vent shaft compound

This will be accessed via Whielden Lane then on to the A413, A355 A40 and M40. There will be up to 100 cars/LGVs entering and leaving the site each morning and evening and up to 100 HGV two way trips (200 movements) each day. All traffic (including HGVs) leaving the site will have to turn right across the very busy A404 which will lead to seriously increased congestion and accident potential. There will be a temptation for drivers to seek an alternative route past Amersham Hospital and narrow local roads before joining the A413/A355 at the bottom of Gore Hill.
There will also be approximately 420 cars/LGVs per day (two way) and 100 HGVs per day (two way) from the adjoining CFAs 9/10 using the A413 and then the A355. In total, as a worst case scenario, there could be up to 520 extra cars/LGVs using the very busy and frequently congested A413 Amersham Bypass/A355 every morning and evening and up to 200 HGV two way trips each day during the busy period of construction. It goes without saying that this would have a massive impact on traffic flows along these roads causing delays and frustration for other users. These roads are also extensively used by local school traffic, including many buses and coaches. This extends the busy traffic periods considerably.
There would be serious implications for ambulances travelling to Stoke Mandeville Hospital which provides A&E facilities for the whole of South Buckinghamshire. Also affected would be the Chilterns Crematorium whose access is a short distance from where traffic would be emerging from Whielden Lane.

Wider impacts

Beaconsfield

The ES makes takes no account of the implications of the increased traffic on the impact further afield. The A355, which is the access route listed for many of the compounds in CFAs 8/9/10, joins the A40 in Beaconsfield at a mini-roundabout which suffers from frequent congestion. At certain times during construction, there could be up to 720 cars/LGVs using this route every morning and evening along with 260 HGVs (two way trips) at other times. Two further roundabouts would have to be negotiated by this traffic before reaching the M40.

Little Chalfont

It can be assumed that the very high level of extra traffic on this route in conjunction with the regular congestion on the M25 and M40 would lead to many drivers seeking alternative

routes. The most obvious of these is via the A404 from the M25 to Little Chalfont and on to the A413 at Amersham or via Cokes Lane/Nightingales Lane to the A413 in Chalfont St Giles. This would lead to extra congestion through the village which would have an impact on all users of this road but especially commuters and those using the local schools.
Along the A404, between Junction 18 of the M25 and its junction with the A413 in Amersham, there are four schools and one college (two of these with a thousand pupils each) whose only access is via the A404 and another four nearby schools for whom it is the main access. This means that traffic from these schools, combined with the many other schools in the area, leads to a build-up of traffic towards the evening peak which starts at 15.00 and not 17.00 as the report suggests. The morning peak starts around 7.00 and includes this school traffic and so the impact would be even more acute at these times.
There is also a low bridge in the village where HGVs regularly get stuck causing widespread congestion. Presumably some of the HGV construction traffic would exceed the height limit and could have the same problem. Little Chalfont was not included in the traffic assessment when quite clearly it should have been.

Conclusion

The imposition of such a vast amount of additional construction traffic outlined above, in some cases over several years will place an unacceptable load on the local road network. In our view:

- It will mean increased congestion on the major and local roads over a wide area and also affect the M25 and the M40 motorways.
- It will lead to longer journeys for emergency vehicles, public transport and school transport as well as private cars.
- It will lead to greater risks, particularly involving vehicles travelling to Heathrow to catch flights, and it will increase air pollution in the immediate area.
- It will mean increased delays for business traffic and those travelling to work, bringing incalculable costs to those affected

In addition, the assumption (12.4.5) that HS2 workers starting work at 08.00 and leaving at 18.00 and therefore *"arriving before the morning peak hour and leaving after the evening peak hour"* is woefully inaccurate. The morning peak period in this part of South Bucks runs from 07.00 until well after 09.00 and the evening peak starts to build up from 15.00 and last until 18.30 as any local motorist or proper traffic assessment will confirm.

13 - Water resources and flood risk assessment

The key environment feature at risk in this section of the proposed route is the River Misbourne, which is noted in the Environmental Statement (CF8; 7.3.12) as being “of regional value”. This chalk stream has historically shown an interrupted flow pattern as a result of the underlying complex geology and abstraction at public water sources. The assessment of ‘regional value’ ignores the fact that chalk streams are rare global habitats, and thus any threat to the Misbourne needs to be rated as a highly significant adverse effect.

Logic would normally suggest that tunnels are not constructed under valleys, which are usally selected as surface transport corridors (e.g. Bulbourne valley - A41, West Coast Mainline & Grand Union Canal). In order to alleviate the visual impact of HS2 it is proposed to enclose it in a tunnel under the Misbourne valley which, by comparison with the Bulbourne corridor example, is a totally illogical concept.

A major problem in this sector of the HS2 route is the initial crossing point through the Misbourne valley immediately to the north of Chalfont St. Giles, below Pheasant Hill. At this location the tunnel will pass below the area most adversely affected by the original route of the (pre-glacial) proto-Thames river. As a consequence of pre-glacial river action, the chalk in this area is extremely weathered with clay filled pipes and swallow holes deeply eroded into the chalk surface.

The chalk is clearly described in an existing nearby (Grid reference TQ001911) borehole log as "*firm brownish white putty chalk with some gravel size pieces of moderately weak white chalk.....(weathered Upper Chalk)*" to a depth of 16 metres below surface. Given that the depth of the tunnel crown in this area is within 22 metres of the surface then less than 6 metres of normal chalk exists above the tunnel in several places. The potential for ground surface collapse at such locations is recorded in the Environmental Statement (Appendix WR-002-008, section 4.2.10) where it states that "*Some voids may be present in the vicinity of Chalfont St Giles within disaggregated weathered Chalk, which can have a thickness of up to 16m as indicated by Morigi et al. (2005), but it is not possible to predict their presence without detailed ground investigations.*"

The placement of the Chiltern tunnel beneath the Misbourne valley at this location is highly contentious and needs to be seriously reconsidered. Detailed ground investigation in this area must be carried out before any construction work is considered.

It is clearly recorded in the Environmental Statement (Appendix WR-002-008, Table 7) that "*Tunnel construction under the River Misbourne will result in settlement with a low risk of increased vertical permeability in base of River Misbourne potentially causing increased loss in flow*." Given the natural variability in the flow of the River Misbourne it seems inevitable that any "*increased loss in flow*" will result in the disappearance of the river from ground level. It is also asserted here that the assessment of a "*low risk of increased vertical permeability*" is a gross underestimate, if not disingenuous, given the known disaggregation of the chalk immediately below surface in this part of the river valley.

The total length of the Chiltern Tunnel is below groundwater level (Appendix WR-002-008, Figure 3). It is recorded (Appendix WR-002-008, Table 7) that groundwater abstraction from licensed water sources within 1 km of the tunnel route totals in excess of 68.25 million cubic metres of water per year, equivalent to approximately 187 thousand cubic metres per day. It has been calculated that the residents of the Misbourne valley above Gerrards Cross need approximately 30,000m^3 per day of water to satisfy current requirements. Between them Thames Water and Affinity Water are licensed to abstract a maximum of 14,000m^3 per day. So already half of the basic water needs of the area have to be derived from outside the Misbourne catchment area. Any damage to the Misbourne aquifer during and after tunnelling will impact directly and immediately onto the regional water supply, which is already under resourced.

The tunnel route passes less than 30 metres below Shardeloes Lake (Appendix WR-002-008, Figure 3). It is difficult to envisage the lake surviving under these circumstances. The lake sits on the New Pit chalk Formation which is relatively clay rich and therefore of low porosity and permeability; however this chalk formation is known regionally to be crossed by numerous sub-vertical and sub-horizontal joints and fractures, meaning that it will still act as a ground water pathway. Disturbance of such structure both during and after tunnel construction must impact on the lakes existence. Loss of the lake would be a major adverse impact.

13.4.39 states that: *When the River Misbourne has water in it (it is frequently dry) the river water is not always in hydraulic connectivity with groundwater in the underlying chalk.*
The river is in hydraulic connectivity with the groundwater in the underlying chalk and has flowed continuously for 20 years in the middle reaches between Little Missenden and Amersham.

13.3.24 states that vertical groundwater flow is generally restricted by a layer of weathered Chalk at the surface of the Chalk and some thin layers of finer material in the superficial deposits. However, the lower permeability layers are not consistent across the valley either in thickness or presence. Therefore in places the Chalk aquifer is vulnerable to contamination from the gravels and lakes due to the potential hydraulic continuity that is present.
Shardeloes Lake, which is upstream of Amersham, is likely to depend on inflows from further upstream during dry periods rather than groundwater contributions through the base of the lake. Information available indicates that groundwater levels will often be at or above the base of Shardeloes Lake, particularly following periods of rainfall and high groundwater levels. The recorded water levels in the area also suggest groundwater levels are rising in response to a reduction in licensed groundwater abstraction. This is expected to have changed the surface water–groundwater interaction in recent years. This is a further example of where HS2 Ltd have identified deficiencies in their understanding and then failed to set out a method to improve or resolve said issues.

13.4.9 states that *Groundwater from dewatering at vent shafts will be discharged back into the groundwater via recharge wells within the vicinity of the vent shaft. As a precaution in the event that a technical constraint is identified in detailed design, provision has been made to transfer some discharge from dewatering by pipeline into the River Misbourne near each shaft.*
The Misbourne river is a receptor of high sensitivity, and the Little Missenden, Amersham and Bottom House Lane are located in a SPZ. However the ES does not explain what precautions will be in place to ensure that pollution is prevented from affecting the quality of the river or the Public Water Supply.
A full explanation of these precautions should be completed before the second reading of the bill.

13.4.16 refers to monitoring river flow where viable to monitor prompt decision making in relation to further mitigation following reduction in river flow. However this mitigation is likely to be useless as it would be too late to prevent the loss of habitat, especially if the lake dries out.

13.4.21 refers to proposed monitoring to determine the potential impact on Public Water Supplies and to define mitigation and further mitigation. This statement is meaningless as

once damage has been done, there would be no mitigation available to restore the loss of surface water and its inhabitants

Groundwater

13.4.32 states that: ***if*** *fissures connect the working area of the Proposed Scheme directly to high value receptors such as PWS (even where these are in the neighbouring CFA7), the impact of even low levels of turbidity could cause the closure of a source due to the high quality required to be met for potable use.*

The use of the indefinite term *if* is not acceptable in connection with a potential major impact leading to a significant adverse effect.

Surface water

13.4.38 states that: *where the tunnels pass under the River Misbourne there could be the potential for ground settlement to occur during or soon after construction. Ground settlement could locally increase vertical permeability by activating fractures in the bed of the river.*

This presents a real risk which we believe will persist.

13.4.41 states that: ….. *overall there will be a relatively small stretch of the total river length where there is a low risk that settlement could affect ground conditions and therefore surface water in the River Misbourne.*

We believe that the risks to the Misbourne are understated and that any level of risk is unacceptable.

13.4.49 states that: *in respect of PWS, HS2 Ltd* ***will agree a management strategy*** *with the Environment Agency in consultation with Affinity Water that will cover timing of any physical mitigation, the scale and nature of monitoring and the thresholds at which actions are invoked (in terms of both quality and flow), the nature of other intervention measures and the responsibilities for ensuring agreed actions occur.*

At this late stage it is unacceptable that a management strategy has still to be agreed.

13.4.52 states that: ***until a management strategy is agreed*** *with the Environment Agency in consultation with Affinity Water, as described above, there is the potential for a likely significant temporary residual effect on the Affinity Water groundwater abstractions.*

What more can be said? Such a strategy must be developed before the second reading of the hybrid bill.

CFA 9 – Central Chilterns

1.3.6 This states that there is some flexibility to alter both the horizontal and vertical alignment of the route. While this may be acceptable generally this is not acceptable in an AONB. As an example, Grim's Ditch, a scheduled ancient monument, is already impacted by the proposed scheme. Moving the line to the west could create a further loss. There is also flexibility to move the vertical alignment a maximum of three metres upwards. This is also unacceptable in an AONB, where raising the line could add considerably to the visual and noise impact. If these are not prohibited, at least they should be subject to agreement with the relevant local authority.

2 - Overview

2.1.3 purports to set out the villages in the area. However, both Little Kingshill (within 1km of the proposed route) and Prestwood have been omitted. Prestwood is the largest village in the area, being approximately three times larger than Great Missenden.

2.1.5 fails to recognise the A4128 as a major road. This runs from the A413 at Great Missenden to High Wycombe.

2.1.6 is misleading as it omits Little Kingshill (approx 800 inhabitants) and Prestwood (approx 9,000 inhabitants). It is important to understand that these communities are integrated with the other communities listed. Including these two communities will at least treble the working population.

2.1.7 Little Missenden School caters for 4+ to 7+ not 3-9 as stated. There is an infant school and pre-school in Hyde Heath. In Little Kingshill there is a combined school. Prestwood has a post office and a number of shops. There are three schools, a primary and a junior, and Prestwood Lodge, a school for boys with behavioural and emotional issues, two doctors' surgeries, three dentist surgeries, a chiropractor and a chiropodist.

2.1.8 The list of centres for other services should include Wendover and Aylesbury.

2.1.9. Hyde Heath has a church, St Andrew's, linked to Little Missenden Parish Church. Ballinger has a church, St Mary's, linked to Gt Missenden Parish Church. (These have been recognised in 5.3.4 and 5.3.9) Little Kingshill has a Baptist Church. Prestwood has three churches, Holy Trinity C of E, a Methodist Church and a King's Church.

2.1.10 fails to list the Weights and Measures Gym in South Heath, Great Missenden Cricket Club, Little Missenden and Hyde Heath Cricket Clubs. There are also Cricket Clubs in Little Kingshill and Prestwood which also has a leisure centre and a range of clubs covering soccer, judo and gymnastics for both children and adults. In addition there are open spaces in both Little Kingshill and Prestwood with playgrounds. There are also allotments in both communities.

Access Routes

HS2 construction traffic to and from the construction compounds in this area will cause congestion and delays to many people using the main roads as well as the local roads in the area.

2.3.27 Little Missenden vent shaft satellite compound
Accessed via A413, A40, M40.
Traffic using this route would meet up with vehicles from CFA8 adding to the congestion along the A413 Amersham Bypass.

2.3.34 Chiltern tunnel north portal satellite compound
Accessed via an upgraded access track to Mantle's Wood via Hyde Heath Road, B485 Chesham Road, Frith Hill, A413 and then A40 and M40 and/or A355, A40 and M40.
Traffic using this route would meet up with vehicles from CFA8 adding to the congestion along the A413 Amersham Bypass as well as the A355 through Beaconsfield

2.3.46 South Heath green tunnel (south) satellite compound
Accessed via the B485 Chesham Road, A413, A40 and M40 from the east; and the A413,A355, A40 and/or B4009, A4010 and M40 and/or B4009, A4129, A418 and M40 from the West.
The route via the B4009, A4010 and M40 will have major impacts along roads not designed the high levels of HGV traffic. Princes Risborough town centre as well as congested roads through the outskirts of High Wycombe would be particularly badly affected. This is the main route for ambulances travelling from High Wycombe to Stoke Mandeville hospital. The B4009, A4129, A418 and M40 route would have serious implications for Thame.

2.3.59 South Heath green tunnel north satellite compound
Accessed via Frith Hill, B485 Chesham Road, A413, A40 and M40 from the east; and the A413, A355, A40 and M40 and/or A413, B4009, A4010 and M40 and/or A413, B4009, A4010, A4129, A418 and M40 from the West.
See 2.3.46 above.

As can be seen from the above, there will be major impacts on A413, B485 and A355. The cumulative effect of this traffic is not recognised in the ES,

Footpaths

Below is a chart summarising the disruption to footpaths in CFA 9. This shows the extent of the disruption in a way that is not obvious in the ES. Please see also our comment in our response to Question 4 - Route Wide effects.

Ref	Footpath	Temporary Diversion	Permanent Diversion	Comments
2.2.30	LMi/			No diversion needed, but there will be landscaping
2.3.39	LMi/17	1,500m	South of Portal	Via Bullbaiter's Lane
2.3.39	LMi/21	Open	450m	Realigned to LMi/17
2.3.39	GMi/23/6	100m		Permanent existing route
2.3.39	GMi/23	50m	700m	Realigned via LMi/17

2.3.39	GMi/27	400m	150m	Via Hyde Lane bridge
2.3.39	GMi/33/2	750m	100m	Via Chesham Rd and Hyde Lane Via Hyde Lane bridge
2.3.39	GMi/33/3	Open	50m	Via Hyde Lane bridge
2.3.41	LMi/27	Not given		
2.3.51	GMi33/4	100m	400m	Hyde Lane
2.3.51	GMi33/5	250m	Reinstated	
2.3.51	GMi/28	400m	Reinstated	Kings Lane, Chesham Rd
2.3.51	GMi/79	400m	Reinstated	Kings Lane, Chesham Rd
2.3.51	GMi/80	400m	Reinstated	Kings Lane. Chesham Rd
2.3.51	Frith Hill	400m	Reinstated	
2.3.64	GMi/13	Open	750m	Via GM/12 overbridge
2.3.64	GMi/12	100m	Reinstated	Via GM/12 overbridge
2.3.64	GMi/2	Open	550m	Via GMi/2 overbridge

2.3.39 The proposed route between Mantles Farm and South Heath is complex and hazardous; it needs to be reviewed, preferably leaving Little Missenden 21 and Great Missenden 23 in place.
2.3.64 Great Missenden 2,12 and 13 are all important footpaths and should be preserved with minimum disruption.

Work Camps

Below is a tabulation of the work camps proposed for CFA 9, again shown in a form which highlights the enormity of the disruption to the area, which is not immediately apparent in the presentation of the ES.

Ref	Name	Time Open	No workers	Comments
2.3.27	Little Missenden Vent	6.25 years	30 - 65	Managed Chiltern Main Compound
2.3.34	Chiltern Tunnel north portal - civils	4.25 years	25 - 55	Managed Chiltern Main Compound
2.3.43	Chiltern Tunnel north portal - rail	2.00 years	20 - 25	Managed Chiltern Main Compound - rail
2.3.46	South Heath Tunnel south	7.75 years	110 - 135	Managed Small Dean Viaduct Compound
2.3.56	South Heath Tunnel north - rail	1.75 years	25 - 45	Managed Chiltern Main Compound - rail
2.3.59	South Heath Tunnel north - civils	3.75 years	25 - 40	Managed Small Dean Viaduct Compound
	Total Workers - civils		190 - 285	
	Total Workers - rail		45 - 70	

Properties Demolished

Below is a tabulation of the properties to be demolished in CFA 9, which demonstrates - in a way the ES fails to do - the significance of demolition in a close-knit rural community.

Ref	Road / Area	No of Residential Properties	No of Outbuildings	No of Commercial properties
2.3.37	Rowen Farm	1	3	
2.3.37	Hedgemoor	1	1	
2.3.37	Sheepcotts Cottage		2	
2.3.37	Chapel Farm		2	
2.3.37	Meadowleigh	1		
2.3.39	Annie Baileys	1		1
2.3.39	94 King's Lane	1	5	
2.3.39	90 King's Lane	1		
2.3.39	86 King's Lane		2	
2.3.39	Elwe's Farm		2	1
2.3.39	Weights & Measures Gym			1
2.3.39	Orchard Cottage		1	
2.3.39	Chiltern Cottage	1	1	
2.3.39	National Grid Pylons			2
2.3.62	National Grid Pylons			1
2.3.62	Mulberry Park Hill	1	4	
	Total Demolitions	8	23	6

2.3.82 states that inert excavated material (spoil) will be placed on land at Hunt's Green Farm in CFA 10. This is unacceptable in an AONB. The landscape should not be reshaped to accommodate excess spoil it should be removed from the AONB.

A better alternative would be to avoid the AONB altogether or at least to tunnel underneath to avoid changing this designated landscape.

2.3.85 Table 3 states that 6,976,960 tonnes of material will be excavated in CFA 9. As solid material this will be approx 2,800,000 m3 with bulking up this will be close to 4,000,000 M3. This is a huge amount of spoil to dispose without creating a completely different land contour.

Operation

2.4.2. The first services will leave Euston at 05.00, thus passing through the Chilterns at 05.20. The last train into Euston will arrive at midnight, thus passing through the Chilterns at 23.40. With up to 18 trains per hour, this will substantially reduce the peace and tranquillity of the AONB. The trains will also introduce light pollution at night from both the carriages but also from the pantograph.

2.4.7 sets out that the maintenance regime will be at night starting at midnight and finishing at 05.00. This will involve noise e.g. from grinding rails, diesel engine movements etc and lighting.

Community Forum Engagement

The Society has had representatives at the Community Forum meetings for CFA 9. These have been an almost complete waste of time. HS2 refused to appoint an independent minute taker which meant that there was always disagreement over exactly what had taken place at the meetings. Minutes taken by both parties always differed leading to much wasted time at subsequent meetings. They also failed to respond to a number of requests.

2.5.4 contains the main concerns of the forums, and are still valid as there has been very little change in the proposed scheme.

2.5.5 talks about the consultation on the Draft Environmental Statement. This was full of errors, inconsistencies and *'this will be dealt with in the Final ES'.* It is apparent that no notice has been taken of the responses to that consultation.

2.5.6. The HS2 staff who attended the forums were either supercilious or were not allowed to engage in a serious debate about anything. The Area Manager's main concern was to avoid agreeing to anything.

Extended Chiltern Tunnel

The various alternatives looked at have all been rejected on cost grounds although:
2.6.11 recognises the environmental, cultural and heritage benefits that would derived from a fully bored tunnel to the northwest of Wendover.
What has not been recognised is that the essential nature of the AONB would be preserved. The social and economic damage through the disruption of up to seven years with construction and loss of visitors has also been ignored.
Raising the alignment by five metres reduces the cost of construction as stated in 2.6.32 and 2.6.34, but increases the environmental impact of visual, noise and light pollution.
In a large number of sections the catenary towers have become visible. Where bridges could have followed the contours of the land these are now generally raised, adding a visual distraction to the landscape. The opportunity to create wide green bridges has been lost, which would not only accommodate PRoWs, but would also allow room for animal migration paths, which the proposed scheme ignores completely.

Leather Lane is a sunken lane, a very ancient form of byway and typical of the Chiltern landscape. It would be preferable for this type of landmark to be retained. A fully bored tunnel would achieve this.

3 - Agriculture, forestry and soils

3.2.3 sets out an assumption that agricultural land disturbed through construction of the route will return to pre-existing quality. This needs to be assessed on a field by field basis as disturbing the underlying soil can change drainage patterns and introduce a change in the chemical balance of the land, eg. when applying chalk to a previously acidic soil. Also this is subject to the Code of Construction Practice being observed properly, which was not the general experience with HS1 in Kent.

3.3.20 notes that prehistoric cross-ridge dykes suggest that a pattern of trackways had been established before Roman times. These ancient patterns are rare and need to be preserved for future generations.

3.3.23 notes that approximately 17% of the study area, i.e. within 2km (3.2.2) of the proposed route, is wooded and that as the national average is 10%, this makes woodland a resource of low sensitivity. This is a fatuous comment. The UK is under-forested compared with the rest of Europe. The country needs a greater density of forest to help with CO2 reduction. As such woodland is a receptor of high sensitivity. As most of the woodland is ancient woodland, this makes it even more sensitive as a receptor.

3.2.25 Table 9 sets out an assessment of the permanent impact. Again the assessment of the impact is called into question, by the moderate adverse effect on Hyde Farm. Not only is a large part of the holding taken but the farm will be on the side of a 25m deep cutting with up to 36 trains per hour passing. The same applies to 94 King's Lane, Bury Farm and Mulberry Park Hill.

3.3.26 Table 5 shows the holdings within the 4km wide zone. This comprises 21 holdings totalling 1,509ha.of which 15 have not been approached by HS2 Ltd. This again shows how little effort has gone into establishing the baseline

3.4.6 The scheme design seeks to reduce structural disruption, as far a *reasonably practicable.* What does this mean?

3.4.7 says that restored land will be subject to five years of managed aftercare, meaning a further period of disruption, although necessary.

3.4.8 169.9ha of agricultural land will be needed during the construction period, of which 144.2ha will be BMV land. Only 65.8ha of this will be restored, leaving a permanent land take of BMV land of 78.4ha. This represents a substantial loss of precious land.

Table 7 sets out the impact on the 21 holdings. Of these the report in 3.4.16 considers that 15 holdings will suffer major/moderate or moderate effects during construction. However, the ratings are suspect as, for example, Elwis Field Farm, where 100% of the land is required, but this is only rated as a moderate adverse impact. This calls into account the whole of the assessment of impact.

3.4.17 states no farm enterprises are particularly sensitive to noise or vibration during the construction period. However only 8 owners have been interviewed and a number of the holdings have horses, which are sensitive to noise. There is also no mention of the impact on Chapel Farm, which lies immediately adjacent to the proposed route. Again the quality of analysis and opinion is called into doubt.

3.4.20 Table 8 shows the permanent land take which includes 98ha of farmland and 13.8ha of woodland. 3.4.21 states that BMV land is a receptor of moderate sensitivity in this study area. What this means is that because there is a comparatively large amount of BMV land in the study area, the impact of a loss is moderate. However, nationally BMV land is a receptor of high sensitivity. Using this interpretation the impact is a major adverse impact. This again demonstrates the unreasonable assumptions used in assessing the impact of the proposed scheme.

3.4.23 states that the report assumes that the land taken for the South Heath tunnel will be returned to agricultural use, however some of this may used for woodland, thus increasing the amount of BMV land lost.

3.4.24 sets out the loss of woodland as 13.8ha, which is assessed as insignificant, as there is a lot of forestry in the area. Refer to 3.3.23 above on the unrealistic assessment of the loss of woodland. In addition the woods being lost are ancient woodland, which even this ES agrees is irreplaceable.

3.4.25 shows that a residential property will be demolished at Middle Grove Farm, but this does not appear in the above list shown in: *2.3.*49 *Table 2: Demolition works at South Heath green tunnel satellite compound and Chilterns main compound.*
This in another example of the inadequacy of the assessment.

4 - Air Quality

4.2.3 states that the degree of significance of air pollution is dependent on the number of receptors nearby. Thus less than 10 properties, within 20m of a site, heavily impacted by dust, is considered insignificant.

4.4.6 Although admitting there are a number of properties that will be directly impacted, the conclusion is there is no significant impact.

5 - Community

5.3.1 The baseline data only covers 1km from the proposed scheme. However this underestimates the impact on the surrounding communities as communities in the Misbourne Valley are closely inter-connected. (See comment on 2.1.3 above)

5.3.5 fails to mention, two pubs, village hall, school and church in Little Missenden.

5.3.7 fails to mention a large builders' merchant and a turkey farm in Hyde Heath. In addition the annual craft fair will lose its site.

5.4.4 The conclusion of no temporary effects on Hyde Heath and Little Missenden is completely ridiculous. The pubs at Hyde Heath and Little Missenden derive a reasonable amount of business from walkers, who will be deterred from using the area, because of the construction. The construction traffic accessing the Chiltern Tunnel portal will use Hyde Heath Road. This will impact connectivity, access to the Misbourne School and Great Missenden station. Little Missenden will be impacted by the construction traffic using the A413.

5.4.11. The conclusion that there will be no temporary impacts on Hyde End is fatuous. The village will be heavily impacted by construction traffic accessing the Chiltern Tunnel north portal. The disruption in accessing the facilities in Great Missenden will have a severe impact. Travel to schools in Great Missenden and Aylesbury will be impacted, and possibly to Chesham with delays to school buses.

5.4.22. The opinion that the diversion of Frith Hill will be a minor adverse isolation effect is to ignore the reality, that an additional 400m will add 10 min each way to school children's walk to school.

5.4.32. No temporary effects on Great Missenden. There will be a significant impact on traffic on the A413. This will cause traffic to back up in Great Missenden between 07.00 and 09.00 and in the late afternoon. Businesses in Great Missenden will be impacted by the loss of tourism based on walkers, who will be put off accessing the area because of construction. The construction has also blighted property in the area, impacting estate agents' and solicitors' business.

6 - Cultural Heritage

6.2.4 states that not all areas of the survey identified in the archaeological risk model were available for survey. Another example of incomplete survey work. We suggest that work should be completed before second reading.

6.3.4 demonstrates the poor quality of the survey work in that Great Hundridge Manor has been misspelt as Great Humbridge Manor.

6.3.5/6/7 list non designated archaeological remains which lie wholly or partly in the proposed scheme. This risks losing three assets of high value, five of moderate value, seven hedgerows that are historically important, and a further seven considered to be of low value.

6.3.8 lists 23 historic buildings whose settings are likely to be impacted.

6.4.27 assesses the impact on the setting of Grade II listed Hyde Farm and Sheepcotts Cottage as a moderate adverse effect, which has to be the understatement of the report. Both these properties will be on edge of a 25m deep cutting.

6.4.28/30 describe impacts on the settings of Grade II listed Cottage Farm and Woodlands Park, Grade II listed Bury Farm, Grade II listed Hammondshall Farm. All of these are 'considered' moderate adverse impacts. This is a complete under valuation of these buildings.

6.4.33/34 set out further work needed to assess the impact on heritage assets. This should be completed and consulted on before the second reading of the bill.

6.5.3 sets out the permanent impact from operation, which are considered moderate. Again a totally unrealistic assessment.

7 - Ecology

7.2.4 Significant areas not accessed for ES. As some of these are ancient woodland, and could contain protected species, surveys should be completed before Second Reading

7.3.3 lists designated sites. These are summarised and the scale of the adverse impact is set out in the following table:

Name	Area (ha)	Designation	Location	Type of Woodland
Weedon Hill Wood, High Springs, Ostlers Wood	49.9	LWS / BAP	Adjacent to Little Missenden Vent shaft	Ancient
Mop End Lane	2.5	LWS	Adjacent to land west of Shardeloes Lake	Hedgerow
Mantles Wood	20.5	LWS / BAP	Chiltern Tunnel site	Ancient
Hedgmoor / Farthings Wood	12.9	LWS	Chiltern Tunnel site	2.6ha ancient / Woodland
Sibley's Coppice	7.5	Habitat of principal importance / BAP	South Heath Tunnel	Ancient
Rook Wood	30.9	LWS	Next to ecological compensation site	Ancient
Hyde Heath Common	5.2	BNS. Habitat of principal importance / BAP	Next to ecological compensation site	Woodland and grassland
Hyde House Wood	18.9	BNS. Habitat of principal importance / BAP	Next to ecological compensation site	Woodland
Hyde Lane Verge	0.4	BNS	Next to ecological compensation site	Hedgerow
Jenkin's Wood	3.1	Habitat of principal importance / BAP	Adjacent to Proposed Route	Irreplaceable Ancient
Havenfield Wood	2.9	Habitat of principal importance / BAP	Adjacent to Proposed Route	Irreplaceable Ancient
Woodland on Route	44.4		Impacted	
Woodland	105.3		Next to ecological compensation site	
Woodland	6.0		Adjacent to Proposed Route	
Total at risk	155.7			

7.3.9 16km of hedgerows in the land required for construction. Only 5.3km was actually inspected. All proved to habitats of principal importance and 2.7km qualify as important hedgerows. However it states that only 2.1km of these are in the construction land take. As over 10km of hedgerows have not been surveyed, this is not a logical conclusion. Again the surveys need to be completed before the second reading of the hybrid bill.

7.3.10 1.05ha of orchards is affected by the scheme. All of this is BAP (biodiversity action plan) local habitat, and 0.59ha are principal habitat.

7.3.11/12 identifies 19.3ha of grassland, but is dismissive of the quality.

7.3.13 Five ponds were identified on the land required for construction. Only one pond was accessed. This supported great crested newts and thus qualifies as a principal habitat. The other four ponds almost certainly sustain great crested newts. They are dismissed as of local/parish value. Another example of downplaying the quality of habitat found. Surveys need to be completed before second reading.

7.3.16 Table 10 sets out a list of protected species. This includes five areas where bats have been found, including a maternal roost of pipistrelle bats, which is in the land to be acquired. Barn owls have been found along the line. These are particularly sensitive to trains. Only one breeding pair of red kites found. The red kite is common in this area. It is not uncommon to see 6 or 8 birds at the same time. This is evidence that the ES has been rushed.

No surveys have been carried out on the River Misbourne. There are trout and crayfish in the river, as well as other fish species. There is anecdotal evidence of water voles along the stretch of the river from Deep Mill Lane to Shardeloes Lake. With the tunnelling under the river north of Shardeloes Lake, there is a recognised risk that the flow of water through the aquifer could be changed, which would risk the whole habitat of the upper Misbourne. The ES should contain a complete analysis of the river environment. This should be completed before the second reading of the hybrid bill. NB. Water voles and English crayfish are rare protected species. The ES also fails to address reestablishment of migration paths for badgers, deer and other animals.

7.4.1 The realignment of Leather Lane is presented as a benefit, but ignores the fact that a number of trees and hedges will be lost. The best mitigation would be to leave well alone.

7.4.3 / 20 sets out the impacts on the various woods, habitats and species and makes devastating reading 7.4.21 / 34 sets out mitigation proposed. This mainly comprises the planting of new trees, but does not address connectivity across the line.

7.4.22 admits that that ancient woodland is irreplaceable. 7.4.26 admits that it will take 50 years at least for these replaced woods to mature.

Overall the mitigation, provided by a tunnel to the north of Wendover would eliminate all the adverse effects identified, and substantially reduce the risk to species from translocation, loss of migration paths etc.

Section 7.5 deals with the impact of operations on ecology.

7.5.2 / 6 sets out the serious risk of bats colliding with trains and /or disoriented by the passing noise. However the ES fails to mention the impact on bats of light from train carriages and the pantograph.

7.5.7 identifies that breeding bird densities can be reduced by noise, but dismisses the impacts of trains as they pass quickly. The assessment ignores the fact that with 18 trains per hour each way less than two minutes between each passing train; at times the noise will be almost continuous.

7.5.9 identifies that barn owls are likely to be killed by passing trains. 7.6.12 identifies putting up nesting boxes 1.5km from the line as a form of mitigation, in the hope that barn owls would find them. Better mitigation would be a tunnel to the north of Wendover which would obviate any of these issues.

8 - Land Quality

8.2.3 identifies access constraints. Not all sites considered to have the greatest potential for contamination have been visited, and a desk top study is proposed instead. This is not

satisfactory in an AONB. All the sites should be visited and reported on to Parliament, before the second reading of the hybrid bill

8.3.6 The White Cretaceous chalk is designated as a principal aquifer by the EA.

8.3.7 The entire route will be located in a Source Protection Zone (SPZ)

8.3.21 Table 11 sets out receptors and their sensitivity. Principal aquifers and the River Misbourne are identified as receptors with high sensitivity.
An alternative route should be considered to avoid public water supplies!

8.4.2 sets out that further investigations will take place to confirm the full extent of areas of contamination and as a risk assessment. These studies should be carried out and reported to Parliament before the second reading of the hybrid bill.

8.4.10 Table 12 sets out identified sites of potential contamination. However it omits the risk of tunnelling through the aquifer as a potential source of pollution.

9 - Landscape and Visual Assessment

9.2.2 describes the Zone of Theoretical Visibility (ZTV), but then excludes the temporary impacts of cranes and other large construction equipment, and more importantly excludes the impacts of the overhead line equipment on the view. The former is understandable, the latter is considered to be direct obfuscation. With the raising of the line by 5m in many of the cuttings, the catenary towers will be clearly visible. At night there will be a line of light flashes from the overhead power supply every few minutes as the train passes.

9.2.4 states that access was limited, and that in several areas PRoWs were inaccessible. As by definition, the latter are accessible, it demonstrates the minimal quality of the work carried out.

9.3.4 This assessment concludes that the landscape is of fair condition. What does fair condition mean? In reality this is a subjective view. However as the landscape is part of an AONB, its designation is clear. At least the final conclusion was that the Upper Misbourne LCA is of National Value.

9.3.5 considers the Hyde Heath North LCA as medium tranquillity. As this is quieter than the Upper Misbourne, which is considered to be medium tranquillity, this by definition is a wrong appraisal. It also misses the point that there are areas of complete tranquillity.

9.4.10 / 20 covers the temporary visual impacts on the area. The ES concludes that these will have a major adverse effect over a period up to 7.5 years.

9.5.7 / 17 set out the landscape assessment. The ES concludes that there will be a moderate adverse effect in Year 1. This is a complete underestimate of the change in the landscape with deep cuttings from Mantles Wood to the south portal of the South Heath Tunnel, and the loss of considerable woodland.. The change is considered to be a major adverse impact. Even in year 15 and year 60 there will be a substantial adverse impact, through creating a huge trench. The almost constant noise of trains night and day will reduce the level of tranquillity

substantially. In addition at night there will be the intrusion of light flashing from the pantograph.

9.5.99 states that there will be no significant effects in Year 15. This is palpably incorrect with a kilometre of deep cutting.

10 - Socio-economics

10.3.8 The quality of the assessment is shown by the comment that average unemployment in England was 7% in 2011, when according to the ONS it was 8.1%

10.4.3 states that *no non-agricultural businesses have been identified which are expected to experience significant amenity effects from the proposed scheme.* This completely ignores the impact of the scheme on people visiting the area:
Local businesses which rely on tourism, shops, restaurants, cafes and the Roald Dahl Museum; local businesses providing professional services such as doctors , dentists, estate agents and solicitors; the adverse impact on business creation, due to traffic etc, with people choosing to set up business elsewhere; and the adverse impact of attracting new employees because of the traffic disruption.

10.4.6 Construction employment is not necessarily a benefit. As the report recognises, unemployment is very low compared to the national average. Currently there is plenty of work in the area for people involved in the construction industry. The main impact of HS2 on the economic activity in the area therefore will be to allow contractors to increase contract rates.

10.4.16 / 18 tries to give the impression that there will be a net benefit to the area. However they have not identified the impacts set out above, or, more cynically, have chosen to ignore them.

11 - Sound, Noise and Vibration

11.2.1 / 7 set out the baseline sound as measured by HS2. This shows that the baseline is generally 45db to 50db during the day, with one relatively small area impacted by higher sound levels. It also states that a night-time the sound level will be at least 10db less. This assessment ignores the note in Volume 1 that there are areas of even greater tranquillity in the hidden valleys.

11.2.12 sounds reasonable as it states that they will assess against a background of 2012/13. However the real impact is the change in sound level that will take place whether it is during construction or with the introduction of trains.

11.2.9 states that it is likely that the majority of receptors along the proposed route are not currently subject to vibration. This is almost certainly the case.

11.3.3 states that some tunnelling support activities will take place during the evening and night-time. This will heavily impact people in Hyde Heath and Hyde End as well as the cottages along the A413 near Little Missenden. All the fine words in 11.3.6 about Best Practicable Means mean nothing if the working hours are not strictly controlled.

Practicable is defined in the dictionary as ‘capable of being done’ Control of working hours is certainly something that can be done. The Government needs to accept that working in an AONB means that it will take longer and cost more than working elsewhere.

11.3.22 /24 assesses the impact of airborne and ground noise as not being significant except in a small part of South Heath. This assessment completely ignores the impact on properties in Hyde Lane and Hyde End from the construction traffic dealing with the Chiltern Tunnel North portal; the working during the evening and at night time at the north portal; and the construction of the deep cutting from the north portal to South Heath. This represents a complete under assessment of the impact on a number of properties.

11.4.2 sets out the expected train schedule with up to 18 trains per hour each way between 07.00 and 22.00, effectively a train less than every 2 minutes. This will provide an almost constant elevated sound level. The bigger intervals before and after the peak hours will create a greater rise and fall in the noise level compared to the ambient noise, and at a time when people will be trying to sleep.

11.4.13 states that *the Interim Target defined by the World Health Organisation Night Noise Guidelines for Europe is set at a lower level than those set out in the Noise Insulation (Railways and other Guided Transport Systems) Regulations 1996.* However HS2 still seeks to use the levels set out in the Regulations. As the WHO target is an Interim Target, the noise levels used in assessing the impacts of HS2 need to set at a lower level than the Interim Target eg. 5db below. Realistically, as a future major infrastructure project the target level should be set at the L*Night Time Noise* level set by the WHO of 40dB

11.4.14 states *that ground borne vibration will be avoided or reduced through the design of the track or track bed.* This needs to read *will be avoided.* The use of the word ‘reduced’ is another let out for the contractors and designers.

11.4.15 identifies Sheepcotts Cottage as being impacted by high noise levels however there are other properties on Hyde Lane that are likely to be impacted.

11.4.20 Table 17 confirms the severe impact on properties in Hyde Lane.

12 - Traffic and Transport

12.2.1 The assessment in Volume 1 is inadequate. The rush hour is defined at 08.00 to 09.00 and 17.00 to 18.00 in CFA 9. As recognised in the Community analysis a lot of people in CFA 9 commute to work. Many of the commuters use their cars either to get to a station or to drive to work. The A413 and A355 are very busy from 6.30 onwards to around 9.15. For Great Missenden the morning rush starts before 07.00 with trains running every 16 minutes from around 6.30. These trains pick up a large number of passengers at Great Missenden.

Commuters come from all around the area, north, south, east and west. There is another commuter surge between 09.00 and 09.15 for the first train with reduced fares. The three schools in Great Missenden start receiving children from 08.15 until 9.00, with many of the children being brought by car. Because of the grammar school system in Buckinghamshire, children in CFA 9 attend secondary schools in Aylesbury, Chesham, Amersham and High Wycombe mainly by bus. These buses are on the road from before 08.00. The afternoon rush

hour commences around 15.00 with children being picked up from primary school. This continues through to 16.30. Commuters start to return around 17.00, arriving both by car and rail. The rush starts to decline around 19.00.

12.2.4 covers bus routes, but ignores the impact of school buses. Prestwood Lodge, a school for children with emotional and behavioural issues, draws pupils from across South Bucks arriving by bus and taxi.

12.2.5 seeks to play down the impact of congestion but as the baseline is so inadequate, the study certainly fails to estimate the impacts realistically.

12.3.3 talks about PRoW surveys to establish footpath use. These were carried out during a very short period. Obviously weather plays a significant part in footpath usage as well as weekends and Bank Holidays as well as time of day. The assessment needs to be carried out over a much longer period and under all of the above conditions in order to get a true assessment.

12.3.4 sets out the roads believed to be affected. This however fails to take account of the pressure on Great Missenden caused by traffic issues especially on the A413.

12.4.1 sets out avoidance and mitigation methods. However many of these are not used in CFA 9. The haul route map TR-03-054 shows clearly that the haul routes will all be on local roads, with no haul roads along the route.

12.4.2 states that the draft Code of Construction Practice includes measures which seek to reduce the impacts and effects of deliveries of construction materials and equipment. As the rush hour has been incorrectly defined, such measures will be redundant.

12.4.3 states that where ***reasonably practicable*** a travel plan will be put in place. Again this is more of a hope and a prayer than any real solution. What does *'reasonably practicable'* really mean in this context and who decides the criteria?

12.4.9 Table 18 sets out the construction sites in CFA 9.and the traffic movements this indicates that the B485 will have 310 to 400 car trips each morning and evening and 100 – 150 HGV at other times.. These will all use the A413, which will also have 80-90 cars and 50-60 HGVs going to the Little Missenden vent shaft, as well as construction traffic accessing sites in CFA10. Inevitably this will lead to congestion and lead to drivers seeking alternative routes. The most likely of these would be via the Missenden Road and Rignall Road from Butlers Cross then through Great Missenden. This route just happens to pass Chequers – not that this will inconvenience the Prime Minister as he usually visits by helicopter!. This route would also avoid the delays caused by the construction of the Small Dean viaduct in CFA 10. These works are likely to take 41 months. There are also safety concerns as traffic leaving the Little Missenden vent shaft compound would join the A413 on its fastest stretch which is dual carriageway with a 70mph speed limit. Perhaps of even more concern is the fact that traffic entering the compound will have to turn right across both carriageways. A tricky manoeuvre at the best of time but downright dangerous during busy periods.

12.4.13 /15 set out the impacts on junctions. Again the assessments are optimistic because of failure to assess the rush hour properly.

12.4.20 claims there will be no impact on bus services. However, as school buses failed to be identified and the rush hour definition is inadequate, this is a suspect conclusion. More work is needed over a longer period.

12.4.21 claims there will be no impact on access to stations resulting from the proposed scheme. However, as the rush hour definition is inadequate, this is a suspect conclusion. More work is needed over a longer period.

12.4.22 sets out the impact on footpaths. This fails to recognise the impact of the proposed scheme on visitors who come to the area to walk and cycle.

12.4.24 takes into account construction traffic and transport impacts of works undertaken in neighbouring study areas. From the areas to the north including
CFA10 and to a lesser extent CFA11, the cumulative average construction traffic flows of approximately 310 cars/LGV per day (two-way) and 60 HGV per day (two-way) have been included in the assessment for this area. This amount of additional traffic will increase substantially congestion during the peak periods as well as problems posed by up to 15 HGV movements per hour (assuming these are not during peak periods as promised).

13 - Water resources and flood risks

From just south of the Chiltern Tunnel north portal the HS2 route is shown to be above 'Inferred groundwater levels' (Appendix WR-002-009, Figure 2) back to Little Missenden. South of Little Missenden the tunnel level is below the inferred ground water level and therefore subject to an increased risk of flooding.

CFA 9; WR-002-009, section 13.3.40 states that "*The River Misbourne catchment is considered by the Environment Agency to be overabstracted. In relation to WFD targets, the Environment Agency is seeking to improve the water body status by reducing PWS abstractions. This process is ongoing and is likely to result in changes to the hydrological regime of the River Misbourne and the aquifer respectively*". Given the adverse impact of tunnelling on groundwater abstraction in the Misbourne valley, it is likely that such improvements might be achieved. The construction of HS2 at the same time may create substantial water loss in the valley during tunnelling through this highly permeable substrata.

The term "Green tunnel" as at South Heath, is misleading to the public. It is no more than a cut and fill excavation which totally removes the existing structured chalk prior to the emplacement of concrete tunnels and back filling with the now disaggregated unstructured chalk. Any original natural drainage pathways, via joints and fractures in the chalk, will be completely destroyed during this excavation. The final product of a replanted ground surface may appear to be a natural landscape; however the subsurface structure will have been removed during construction. This will impede and alter both surface and groundwater flow post construction.

13.1.3 claims to set out key environmental issues relating to water resources and flood risk. However it fails to recognise the risk of polluting the water supply through tunnelling. This effect will occur mainly in CFA8, but also carries across into CFA9. Table 5 in Volume 5 WR-002-009 fails to list the land through which the Misbourne flows between the Link Road and Doctors Meadow, a distance of approx. 1km, and includes Upper and Lower Pond and Missenden Abbey Park, which are all key for local wildlife.

Table 6 in Volume 5 WR-002-009 lists two High Value receptors, the River Misbourne and all Water Bodies. In this table the report sets out the risk of pollution or high suspended solids entering the water table. There are also three ponds listed, which will be lost in construction. These are not mentioned in Volume 2 CFA9.

Table 7 sets out seven impacts of construction on the principal aquifer, and seeks to assess them as insignificant. However together they represent a risk to the water quality in the aquifer. The table sets out five impacts which together represent a significant risk to the public water supply.

13.2.3 states that site visits were undertaken in the vicinity of the River Misbourne in September 2013 and June 2013. Ideally these visits should have been in March or April when the river runs at its highest. The connectivity with ground water is very close in Doctors Meadow and through Little Missenden to Shardeloes Lake. Groundwater is often less than one metre down.

13.4.18 states that *Specific monitoring to determine the potential impact to pubic water supply (Affinity Water) and private abstractions will be undertaken. The monitoring schedule (to be agreed with the Environment Agency and in consultation with Affinity Water) will include monitoring before, during and after construction until the groundwater quality has stabilised within acceptable limits. The monitoring data will be assessed and used to define appropriate mitigation, should it be required.* This basically says that if we find a problem we will try to mitigate it. The best method of mitigation is avoidance.

13.4.20 states that pollutants like bentonite will be used but will be kept to the minimum. 13.4.30 talks about the impact of tunnelling etc on groundwater. It states the *impact is deemed to be insignificant*. The key word here is *deemed*.

13.4.32 states that if fissures connected directly to the public water supply, the source may need to be closed. The geology of the chalk is for the water to percolate through the aquifer in fissures. Not only is there this risk, but there is a risk of permanently diverting the flow away from the PWS.

CFA10 – Dunsmore, Wendover and Halton

1.1.6 states that the Government believes HS2 should be linked to Heathrow. The fact they have excluded the link from this document altogether brings into account the choice of route. One of the key terms of reference for HS2 was to link to Heathrow. As this is now off the table, the alternative routes should be looked at again, and a proper Environmental Impact Assessment completed. The other assumption is that elimination of the Heathrow link reduces the headline capital expenditure numbers.

1.3.6 This states that there is some flexibility to alter both the horizontal and vertical alignment of the route. While this may be acceptable generally this is not acceptable in an AONB. As an example, Grim's Ditch, a scheduled ancient monument, is already impacted by the proposed scheme. Moving the line to the west could create a further loss. There is also flexibility to move the vertical alignment a maximum of three metres upwards. This is unacceptable in an AONB, where raising the line could add considerably to the visual and noise impact. If these are not prohibited, at least they should be subject to agreement with the relevant local authority.

2 - Overview

2.1.6 claims to list the key road structure. However it omits the B4009 Tring Road, which links Wendover to the A41 and Tring. This road is a major commuter route. In addition it fails to list the Ellesborough Road, which provides a principal link to Ellesborough, Princes Risborough and High Wycombe linking up with A4010.

2.1.7 fails to mention that the proposed route also crosses the Ridgeway, a major National Trail going back to prehistoric times, together with the Icknield Way. However these are mentioned in 2.1.12 under recreation and leisure.

2.2.6 describes the route from the South Heath Cutting to Wendover Dean. It identifies a 'sustainable placement area' where approximately 1,000,000 M3 of excavated material will be dumped on an area 1.3km long 450m wide and up to 5m high. This is on Hunts Green Farm, adjoining the proposed route between Leather Lane and Bowood Lane. It includes:

- five overbridges, generally one metre above existing ground level;
- the loss of part of Grim's Ditch;
- various landscaping efforts, and
- a land drainage scheme .

The impact will mainly be a trench starting at 17m deep and coming down to 0m. The catenary towers etc will emerge from the trench like a set of teeth. The overbridges, at one metre above ground level, could be expanded into green bridges to improve migration paths for animals.

2.2.8 describes the route from Wendover Dean to Small Dean This comprises:

- A 100m embankment up to 9m high
- 500m viaduct 18m above existing ground level with 3m noise barriers to the west from the start of the embankment to 70m north of the viaduct.
- 150m embankment up to 8m high

- 500m cutting up to 7m deep
- 3 land drainage / balancing ponds

The impact will be the introduction of a series of embankments and a viaduct up to 18m high, with a 500m cutting, creating a completely alien feature in this wide valley. These will be topped by catenary towers, adding visual, noise and light pollution into this peaceful scenery.

2.2.10 describes Small Dean area. This comprises:

- 900m embankment up to 11m high
- 500m viaduct 14m high across the A413
- 700m embankment up to 12m high
- 2 underbridges
- 6 land drainage / balancing ponds
- Various landscaping including a 5m embankment high north and south of Rocky Lane with 3m acoustic fences on top.
- Various areas of landscape planting.

The high embankment / viaduct across this wide valley will add visual, noise and light pollution. These will be completely alien features in the landscape.

2.2.12 describes the Wendover Green Tunnel. This involves:

- A 1.3km cut and cover tunnel
- The diversion and reinstatement of Ellesborough Road and Bacombe Lane
- The diversion and reinstatement of various PRoWs including the Ridgeway and the Icknield Way.
- Landscaping works.

The temporary impact of this on Wendover and the surrounding area will be serious with regard to noise, dust pollution and traffic disruption. The permanent impact will be substantially less, mainly through the noise reduction afforded by the tunnel.

2.2.14 describes the Wendover North Cutting to Stoke Mandeville South. This comprises:

- 1.6km cutting up to 11m deep
- 250m long embankment up to 2m
- 2 overbridges
- 3m and 5m high acoustic barriers along most of the route
- 3 land drainage / balancing ponds
- Maintenance loops north of B4009. These will be 4 tracks wide with a service road on each side.
- Mitigation via some wetland and grassland area being created

This section adds more alien features into the flat flood plain of the Aylesbury Vale. The main impact will be visual with the noise reduction landscaping topped with 3m and 5m acoustic fences. The maintenance loop takes a large area of land and will add noise at night with trains being prepared from 22.00 to leave at midnight and returning at 05.00 with unloading to 07.00.

2.3.12 sets out what will happen at main compounds:

- Storage of bulk materials
- Receipt storage, loading/unloading of excavated material.
- Fabrication of temporary works equipment and finished goods
- Fuel and plant storage
- Office space
- Parking
- Welfare facilities
- Possibly staff accommodation.

2.3.20 states that Small Dean Viaduct will be a main compound and will be operational for four years three months. Living accommodation for 170 to 240 workmen.
This compound is close to the Bacombe Hill SSSI, which is assessed as having national value. With the major activities here there is a significant risk of impacting the SSSI adversely.

Access Routes

2.3.20 Small Dean viaduct main compound
Accessed via the A413, B4009, A4010 and the M40 and/or to the M40 via A4129 and A418 from A4010 and/or A413, A355, A40 and the M40 in the west, and the A413, A40 and the M40 in the east

2.3.21 Leather Lane overbridge satellite compound
accessed via Leather Lane, Potter Row, Frith Hill, B485 Chesham Road, A413 and the M40 and/or A413, A355, A40 and the M40

2.3.29 Bowood Lane overbridge satellite compound and Wndover Dean viaduct satellite compound.
Accessed via site haul road from Leather Lane, Potter Row, Frith Hill, B485 Chesham Road, A413 and the M40.

2.3.36 Rocky Lane underbridge satellite compound/Wendover auto-transformer station satellite compound and Small Dean viaduct launch satellite compound
Accessed via Rocky Lane, A413, B4009, A4010 and the M40 and/or the M40 via A4129 and A418 from A4010 and/or A413, A355, A40 and the M40 in the west; and A413, A40 and the M40 in the east.

2.3.49 Wendover green tunnel (south) satellite compound and Wendover green tunnel (north) satellite compound
Accessed via a site haul road at Small Dean viaduct main compound from the A413, B4009, A4010 and the M40 and/or the M40 via A4129 and A418 from A4010 and/or A413, A355, A40 and the M40 in the west; and A413, A40 and the M40 in the east.

2.3.62 B4009 Nash Lee Road overbridge satellite compound
Accessed via Nash Lee Road, A413, B4009, A4010 and the M40 and/or the M40 via A4129 and A418 from A4010 and/or A413, A355, A40 and the M40 in the west; and A413, A40 and the M40 in the east.

These access routes give a misleading picture of where the traffic will go. The access routes in the work camp details show that the major routes will be A413, A355, M40. These will aggregate with work camps in CFA9 already using this route to create substantial extra traffic in Beaconsfield, a cumulative impact, which has not been identified.
Traffic is unlikely to use the A4010 from the M40 as this route is on two lane roads through a suburban area of High Wycombe.

Footpaths that will be closed or diverted for varying periods from 6 months to 3 years.

Ref	Footpath	Temporary Diversion	Permanent Diversion	Comments
2.3.26	TLE/2	50m		Reinstated over TLE/2 overbridge
2.3.26	TLE/3	550m	Across Bowood Lane overbridge	
2.3.35	TLE/5	100m via WEN/36	negligible	Diverted under Wendover Dean viaduct
2.3.35	WEN/36	100m	negligible	Diverted under Wendover Dean viaduct
2.3.35	WEN/39	100m	Original alignment	Diverted under Wendover Dean viaduct
2.3.45	Bridleway	400m	Stopped up	
2.3.45	WEN/57	negligible	Original alignment	Via WEN/14, WEN/13/B, WEN/13/C
2.3.45	WEN/57 Bridleway	2,200m	Original alignment	Via WEN/14, WEN/27/BW, WEN/13/BW
2.3.56	WEN/14 Bridleway	Open	100m	Permanent diversion over green tunnel
2.3.56	WEN/13A	200m	Reinstated	Over green tunnel
2.3.56	WEN/6	800m	Reinstated	Over green tunnel
2.3.56	WEN/11	300m	Reinstated	Over green tunnel
2.3.56	WEN/55	200m	Reinstated	Over green tunnel +20m
2.3.67	ELL/25	650m	600m	200m east across new Nash Lee Road overbridge

The above schedule demonstrates the enormous impact that building HS2 will have on the access routes for walkers, cyclists and riders in the upper Misbourne Valley.

2.3.56 Clarification is needed as to what provision is to be made to connect bridleway Wendover 14, footpaths 53 and 13a with Wendover village during construction. Will the connection be permanent and what will be its status? No temporary provision has been made for footpath Wendover 55, which links 54 and 6, during construction.
Is existing bridleway Wendover 14 to be reinstated along the diverted Bacombe Lane to South Street?
It is essential that links between Wendover and its station and the footpaths are maintained throughout the construction period to limit the reduction in usage of the footpath network.

Work Camps

Ref	Name	Time Open	No workers	Comments
2.3.20	Small Dean Viaduct Main Compound	4.25 years	90 - 135	Managed Small Dean Viaduct Main Compound
2.3.21	Leather Lane Over bridge	1.25 years	75 - 130	Managed Small Dean Viaduct Main Compound
2.3.29	Bowood Lane Over Bridge	2.00 years	65 - 125	Managed Small Dean Viaduct Main Compound
2.3.30	Wendover Dean Viaduct	2.00 years	95 - 95	Managed Small Dean Viaduct Compound
2.3.38	Rocky Lane Under Bridge	6.75 years	25 - 80	Managed Small Dean Viaduct Compound
2.3.38	Rocky Lane Under Bridge - rail	1.5 years	27.- 40	Managed Chiltern Main Compound - rail
2.3.39	Small Dean viaduct Launch	2.00 years	100 - 100	Managed Small Dean Viaduct Compound
2.3.50	Wendover Green Tunnel - South	2.75 years	70 - 90	Managed Small Dean Viaduct Compound
2.3.51	Wendover Green Tunnel - North	2.50 years	65 - 80	Managed Small Dean Viaduct Compound
2.3.59	Wendover Green Tunnel - South - Rail	1.25 years	10 - 10	Managed Chiltern Main Compound - rail
2.3.62	B4009 Nash Lee Road Over Bridge	7.00 years	30 - 45	Managed Small Dean Viaduct Compound
2.3.62	B4009 Nash Lee road Over Bridge - rail	2.00 years	25 - 45	Managed Chiltern Main Compound - rail
	Total Workers - civils		615 - 880	
	Total Workers - rail		62 - 95	

The above table demonstrates the significant adverse impacts construction will have in CFA 10, with an average of over 700 workers travelling each way per day, and construction lasting up to 7 years. The attendant mitigation landscaping and planting will take at least 15 years to blend in. Thus the Upper Misbourne Valley and this part of the AONB will be blighted for more than 20 years.

Properties Demolished

Ref	Road / Area	No of Residential Properties	No of Outbuildings	No of Commercial
2.3.34	Durham Farm	1	4	
2.3.43	Road Barn Farm	1	3	
2.3.43	Network Rail railway bridge			1
2.3.43	National Grid Pylons			4

2.3.54	30 Ellesborough Rd	1		
2.3.54	32 Ellesborough Rd	1		
2.3.54	34 Ellesborough Rd	1		
2.3.54	36 Ellesborough Rd	1		
2.3.54	38 Ellesborough Rd	1		
2.3.54	40 Ellesborough Rd	1		1
2.3.54	Community Facility – Wendover Cricket Ground			1
2.3.54	National Grid Pylon			1
2.3.65	National Grid Pylons			2
	Total Demolitions	8	7	10

The above table shows the significant impact on one small section of the Upper Misbourne Valley, and the loss of a treasured community facility in the Cricket Club.

2.3.82 states that inert excavated material (spoil) will be placed on land at Hunt's Green Farm in CFA 10. This is unacceptable in an AONB. The landscape should not be reshaped to accommodate excess spoil it should be removed from the AONB. A better alternative would be to avoid the AONB altogether or at least to tunnel underneath to avoid changing this designated landscape.

2.3.85 Table 3 states that 6,976,960 tonnes of material will be excavated in CFA 9. As solid material this will be approx. 2,800,000 m3 with bulking up this will be close to 4,000,000 m3. This is a huge amount of spoil to dispose without creating a completely different land contour.
2.3.82 Table 1 shows that 5,105,809MT of excavated spoil will be generated in this CFA. Per 2.3.78 the majority of this will be reused as engineering fill material or for landscaping. This gives a clear picture of the degree of change that will be forced onto the AONB if the scheme goes ahead as proposed.

Community Forum Engagement

The Society has had representatives at the Community Forum meetings for CFA 10. These have been an almost complete waste of time. The HS2 staff were unwilling to participate if the meeting was recorded, which seems odd for engagement with the community. They changed the minutes when items recorded did not suit their stance. They failed to respond to a number of requests.

2.5.4 contains the main the concerns of the forums, and are still valid seeing that there has been hardly any change in the proposed scheme. However it fails to list the concern over access to the main A&E centre for the area at Stoke Mandeville Hospital.

2.5.5 talks about the consultation on the Draft Environmental Statement. This was full of errors, inconsistencies and 'this will be dealt with in the Final ES'. It is apparent that no notice has been taken of the responses to that consultation.

2.5.6. The HS2 staff who attended the forums were either supercilious or were not allowed to engage in a serious debate about anything. The Area Manager's main concern was to avoid agreeing to anything.

Route Section Main alternatives

2.6.3 briefly reviews the proposal for an extended Chiltern bored tunnel. It argues that part of the reason for not adopting this would be the impact of having a main compound at the tunnel portal near Stoke Mandeville. While this is true, it would remove one main compound at Small Dean plus 8 satellites in CFA 10 and 4 satellites in CFA 9. If the tunnelling was totally from the south, the dewatering part of the compound would not be needed.

2.6.4 / 7 discusses the disposal of surplus spoil. Three options were considered:

- Remove spoil to Calvert by railway
- The scheme, using the spoil in local engineering works, landscaping and dumping the rest on agricultural land
- Removal of surplus spoil by road to landfill.

The assertion is that there is approximately 1,000,000M3 of surplus spoil to be removed, which is estimated to require 240,000 truck movements. Even with 120,000 full truck movements this equates to 8.5M3 per truck, which seems extremely low or an error.

Extended Chiltern Tunnel

The various alternatives looked at have all been rejected on cost grounds although 2.6.11 recognises the environmental, cultural and heritage benefits that would derived from a fully bored tunnel to the northwest of Wendover. What has not been recognised is that the essential nature of the AONB would be preserved. The social and economic damage through the disruption of up to seven years with construction and loss of visitors has also been ignored.

Raising the alignment by 5m reduces the cost of construction as stated in 2.6.32 and 2.6.34, but increases the environmental impact of visual, noise and light pollution. In a large number of sections the catenary towers have become visible. Where bridges could have followed the contours of the land these are now generally raised adding a visual distraction to the landscape. The opportunity to create wide green bridges has been lost, which would not only accommodate PRoWs, but would also allow room for animal migration paths, which the proposed scheme ignores completely.

Leather Lane is a sunken lane, a very ancient form of byway and typical of the Chiltern landscape. It would be preferable for this type of landmark to be retained. A fully bored tunnel would achieve this.

All of these impacts would be eliminated by avoiding the AONB, or having a fully bored tunnel from the M25 to north of Wendover.

3 - Agriculture, forestry and soils

3.2.3 sets out an assumption that agricultural land disturbed through construction of the route to pre-existing quality. This needs to be assessed on a field by field basis as disturbing the underlying soil can change drainage patterns and introduce a change in the chemical balance of the land, eg when applying chalk to a previously acidic soil. Also this is subject to

the Code of Construction Practice being observed properly, which was not the general experience with HS1 in Kent.

3.3.17 states that as there is a high likelihood of encountering BMV land in this CFA and so this makes BMV land a resource of low sensitivity. The assumption that because there is plenty of BMV land in the area somehow devalues its sensitivity is ludicrous, particularly as BMV land national is a receptor of high sensitivity.

3.3.20 notes that Grim's Ditch is of Iron Age date and represents a substantial land division that still survives as standing earthworks. To wittingly destroy this part of our cultural heritage is unacceptable,

3.3.23 notes that *approximately 18% of the study area i.e. within 2km (3.2.2) of the proposed route is wooded, and that as the national average is 10%, which makes woodland a resource of low sensitivity.* This is a fatuous comment. The UK is under-forested compared with the rest of Europe. The country needs a greater density of forest to help with CO2 reduction. As such woodland is a receptor of high sensitivity. As most of the woodland is ancient woodland, this makes it even more sensitive as a receptor.

Table 3 shows the holdings within the 4km wide zone. This comprises 17 holdings totalling 1,184ha.of which 6 have not been spoken to. This again shows how little effort has gone into establishing the baseline

3.4.7 says that restored land will be subject to five years of managed aftercare, meaning a further period of disruption, although necessary.

3.4.8 states that 235.9 ha will be needed during the construction period, of which 171.1ha will be BMV land. Only 112.9ha of this will be restored, leaving a permanent land take of BMV land of 58.2ha.

3.4.9 demonstrates the impact of the assessment in 3.3.17 that BMV land is a resource of low sensitivity, in that an impact of high magnitude is converted into a moderate adverse effect. Table 5 sets out the impact on the 17 holdings. Of these the report in 3.4.18 considers that 12 holdings will suffer major/moderate or moderate effects during construction. However the ratings are suspect as for example, Hartley Farm, where 88% of the land is required, but this rated as a moderate adverse impact. This calls into account the whole of the assessment of impact.

3.4.19 states that no farm enterprises are particularly sensitive to noise or vibration during the construction period. However only 11 owners have been interviewed, and a number of the holdings have horses and cattle, which are sensitive to noise. Again the quality of analysis and opinion is called into doubt.

3.4.20 Table 8 shows the permanent land take which includes 98ha of farmland and 13.8ha of woodland. 3.4.21 states that BMV land is a receptor of moderate sensitivity in this study area. What this means is that because there is a lot of BMV land in the study area, the impact of a loss is moderate. However, nationally BMV land is a receptor of high sensitivity. Using this interpretation the impact is a major adverse impact. This again demonstrates the unreasonable assumptions used in assessing the impact of the proposed scheme.

3.4.24 sets out the loss of woodland as 2.1ha, which is assessed as insignificant, as there is a lot of forestry in the area. Refer to 3.3.23 above on the unrealistic assessment of the loss of woodland.

3.4.25 Table 7 sets out an assessment of the permanent impact. Again the assessment of the impact is called into question, by the moderate adverse effect on Hartley Farm. Not only is a large part of the holding taken, the access to land is also severed. This would appear to be a major impact.

3.4.32 /33 Permanent impacts are described as loss of 58.2 ha of BMV land with a moderate impact and 10 properties with permanent impacts. These losses have a high adverse impact on the Upper Misbourne Valley.

3.5.2 states that potential impacts from operation are noise from trains and warning signals, and the propensity of operational land to harbour noxious weeds. However it fails to list the impact of light at night from trains and the pantograph.

4 - Air Quality

4.2.3 sets out that the degree of significance of air pollution is dependent on the number of receptors nearby. Thus less than 10 properties, within 20m of a site, heavily impacted by dust is considered insignificant.

4.4.5 sets out dust generating activities will occur at the construction of the Wendover green tunnel, the Wendover Dean and Small Dean viaducts, a series of cuttings and embankments, and the B4009 Nash Lee Road overbridge. Effectively all along the route when haul roads are included.

4.4.6 In Vol 5 AQ-001-010, the assessment for Wendover Tunnel and Bacombe SSSI is that there is no significant impact. The SSSI is of national importance with rare plants, and will be heavily impacted by dust from the Wendover tunnel construction. This assessment needs to be revisited.

5 - Community

5.3.1 The baseline data only covers 1km from the Proposed Scheme. However this underestimates the impact on the surrounding communities as communities near Wendover especially to the west such as Ellesborough are closely inter-connected.

5.3.5 covers Wendover, but only within 300m of the proposed route. This fails to recognise the main centre of the town which lies within 500m of the proposed route. Also Kings Ash and The Lee, which lie close to the route, have not been identified.

5.3.8 identifies the new facilities being built at Wendover for the Chiltern Way Federation, which operates two schools for boys with behavioural and emotional issues. These sites serve a large part of Bucks including Aylesbury. Children are brought in daily by taxi or bus. The development is very close to the proposed route and the school will be severely impacted both during the construction and operational phases.

5.4.5 identifies the A413 as an HGV route serving CFA11.

5.4.6 / 7 identifies the loss of two residential properties in Wendover Dean. The assessment is that these are not significant at a community level.
5.4.8 states that there are no permanent effects, having identified the impact of the view of the construction of the Small Dean viaduct in 5.4.4. This is an inconsistent assessment.

5.4.9 / 5.4.18 sets out the impacts on Wendover and details the temporary impact on properties in Bacombe Lane and the Ellesborough Road. However it fails to consider the impact on St Mary's Church and Wendover House School, which will both be affected by views of the construction, and the heavy traffic on the A413.

There will be a significant impact on traffic on the A413. This will cause traffic to back up in Wendover between 07.00 and 09.00 and in the late afternoon. Businesses in Wendover will be impacted by the loss of tourism based on walkers, who will be put off accessing the area because of construction. The construction has also blighted property in the area, affecting estate agents and solicitors. In addition the impact on Wendover of between 175 and 245 men on their own from the Small Dean Main compound has not been considered. Wendover does not have suitable facilities for their entertainment in the evening. This will have a severe adverse impact on the town.

The severe permanent impact of losing six houses in Ellesborough Road and the loss of the cricket field and pavilion is recognised.

5.5.1 / 2 identifies no significant operational effects on Wendover Dean, Dunsmore and Wendover. This ignores the change in the view for a number of houses, the additional noise and particularly light pollution, particularly as the line is raised on embankments and viaducts up to 18m high.

Again all of these impacts would be avoided by avoiding the AONB or having a fully bored tunnel from the M25 to north of Wendover.

6 - Cultural Heritage

6.2.2 refers to the study area as being the proposed route + 500m. However it also states that all designated heritage assets in the Zone of Theoretical View (ZTV) have been considered.

6.2.4 states that not all areas of survey identified in the archaeological risk model were available for survey. Another example of incomplete survey work. Suggest that work should be completed before second reading of the hybrid bill.

6.3.3 sets out the partial loss of Grim's Ditch a scheduled ancient monument, the loss of ancient woodland and the loss of 1 Grade II listed building. All of the above adverse impacts would be avoided by either selecting a different route or an extended fully bored tunnel to the north of Wendover.

6.3.4 sets out the designated heritage assets in the ZTV. In reviewing Vol 5 CH-002-010, it was noticeable with regard to buildings and groups of buildings that 'setting adds to value' It is therefore a reasonable assumption that building a substantial embankment and two viaducts

through the Misbourne Valley will have a significant adverse impact on the value of these buildings

6.3.6/7 list non designated heritage assets which lie wholly or partly in the proposed scheme. This includes 11 sites with identified archaeological remains. This also includes 16 hedgerows and groups of hedgerows that are historically important.

6.3.8 lists 20 historic buildings whose settings are likely to be impacted.

6.3.9/47 give a cultural overview of this part of the route, and shows the significant loss of artefacts and heritage assets that there is likely to be if the proposed scheme proceeds as planned.

6.3.47 mentions the old turnpike road, but does not set out the historical background. There were two coach companies that operated a service to Buckingham. At each community there were two public houses to service the competing lines. One mainly used the Red Lion, and the other the Kings Head, Arms or Crown. Major taverns were at Amersham, Gt Missenden and Wendover. Interim halts were at Little Missenden, the Halfway House.(now The Firecrest)

6.4.4/15 describes the temporary impacts on heritage assets, and give a picture of the devastation that will be caused. This will affect a number of Grade II listed buildings. Such buildings are often described as being of moderate value. This description again seeks to downgrade the quality of the buildings impacted.

6.4.17/30 describes the permanent impacts on heritage assets. 6.4.18 describes the impact on Grim's Ditch, with part of this scheduled ancient monument being destroyed.

6.4.27 sets out that sections of 16 hedgerows will be removed, describing this a moderate impact. However the loss of hedgerow's will have a major adverse impact on the look of the Misbourne Valley, and will seriously impact on the movement of wild animals through the valley.

6.4.28/30 describe impacts on the settings of Grim's Ditch, 4 Grade II listed buildings at Wendover Dean Farm, 2 Grade II listed buildings at Upper Wendover Dean Farm, Grade II* listed Wellwick Manor and 2 Grade II listed buildings at Wellwick Farm. Other than the High Adverse Impact on Grim's Ditch, the others are 'considered' moderate adverse impacts. This is a complete under valuation of these buildings.

6.4.33/35 set out significant residual effects including

- Loss of an extensive range of archaeological assets, including pre-historic, Bronze Age, Iron Age, Roman and mediaeval items, as well as ridge and furrow field patterns.
- Loss of two farm complexes comprising 6 Grade II listed buildings
- 6 houses

The setting of several historic settlements and buildings will be affected by the presence of the constructed scheme, including landscaping, overbridges and other associated infrastructure. This presence will affect these assets through physical loss or severance of landscape elements or disruption of landscape associations that contribute to their value.

6.5.3 assesses the impact of the Proposed Scheme and noise on the southern part of Wendover, where St Mary's (Grade II*) as a major adverse impact.
6.5.4 / 6 assesses the impact of the proposed scheme and noise on Wendover Dean Farm, Upper Wendover Scheme Farm and Old Mill House as a moderate adverse impact. These are all Grade II listed building, which will have both their setting and their tranquillity dramatically changed. Again a totally unrealistic assessment.

Again all of these impacts would be avoided by avoiding the AONB or having a fully bored tunnel from the M25 to north of Wendover.

7 - Ecology

7.2.3 Significant areas were not accessed for ES. Large areas of farmland and particularly hedges could shelter wildlife. The ES should be completed before the Second Reading of the Hybrid Bill.

7.3.3 details local designated sites Bacombe and Coombe Hill SSSI is within 25m of the Proposed Route. It has species rich calcareous grassland and is a Biodiversity Action Plan site. It is the only known site for the fringed gentian in the UK. The northern part of the SSSI is designated as a Local Nature Reserve. It is criminal to put this area at risk.

7.3.4 details 2 Biological Notification Sites. Areas of both of these are needed for the proposed route: the Wendover Rifle Range and grassland at North Lee.
White Helleborine, a species of principal importance, was reported as present on the line in the Draft ES. This is not mentioned in the final ES. Has this disappeared or is this just an omission?

7.3.5 details 2 areas of ancient woodland which are required for the proposed route: Jones Hill Wood and Rushmoor Wood. These ancient woodlands represent an irreplaceable resource.

7.3.10 22 km of hedgerows in the land are required for construction. Not all have actually been inspected. All those surveyed proved to be habitats of principal importance and 2.5km qualify as important hedgerows. Again the surveys need to be completed before the second reading of the hybrid bill.

7.3.12 lists grasslands near or on the route. It recognises the value of Bacombe Hill SSSI. Access was not available to the Wendover Rifle Range or the Grassland at North Lee. These surveys should be completed before the second reading of the hybrid bill.

7.3.14 Four ponds are affected by the development, only two were inspected, one of which was found to support great crested newts and as such is a habitat of principal importance. They are dismissed as of local/parish value. Another example of down playing the quality of habitat found. Surveys need to be completed before second reading.

7.3.16 / 7 10 ha of orchards is affected by the scheme. All of this is BAP local habitat.

7.3.20 Table 8 sets out a list of protected species. This includes 10 areas where bats have been found, including a maternal roost of brown long-eared bats, a species of principal importance. The majority of these are in the Misbourne Valley, and would be affected by trains.

Barn owls, representing 1.5% of the county population have been found along the line. These are particularly sensitive to trains. It is unacceptable to put these at risk of extinction in the area, as they are in sharp decline nationally.

Two breeding pairs of red kites found. The red kite is common in this area. It is not uncommon to see 6 or 8 birds at the same time. This again suggests that the ES has been rushed.

The ES fails to address re-establishment of migration paths for badgers, deer and other animals.

7.4.4 draws the conclusion that there will be no impact from the construction on Bacombe and Coombe Hill SSSI, although the construction area comes within 25m. The SSSI overlooks the construction of the 'cut and cover' Wendover Tunnel. Not only will there be a significant amount of dust created digging out the trench nearby, but the proposed route is being used as a haul road to service the site at the north portal. This will be a source of dust and other pollutants for three years, which is a significant period of time. The assessment relies on the CoCP being properly implemented, which was not the experience in Kent. The key question is 'Should such a risk be contemplated on such a sensitive receptor of national importance?'

7.4.7 states that 22km of hedgerows will be removed in CFA 10 during construction, of which 2.5 km qualify as important hedgerows. However as a significant proportion of the 22 km have not been inspected, this is an inadequate assessment. This will have a significant impact on animal migration, bats and Barn Owls.

There is a discussion in Water Resources on the impact of construction of the Wendover Tunnel on the flow of groundwater. This could easily affect the Weston Turville Reservoir SSSI, which would have a major adverse impact.

7.4.11 states that: one barn owl nesting site is in the proposed construction area, and will need to be moved. The assessment is that there is a risk of losing this breeding pair. Barn owls are now under pressure nationally.

7.4.14 accepts that there are great crested newts, and loss of ponds will have an adverse effect. However they propose no action to protect this population.

7.4.16 / 21 assesses the impact on bats. Although losing a number of roosts and removing 22 km of hedgerows, which are used by the bats as navigation aids, the conclusion that there will be no significant impact. Evidence again of taking an over-optimistic stance to adverse impacts.

7.4.27 / 40 sets out mitigation measures. These include translocation of ancient wood soils, planting extra trees and translocation of species. Hedgerows will be re-established, but they will still be divided by the substantial embankments with barriers on top. Some migration paths will be possible utilising the Wendover Dean viaduct. The covering over and replanting of the Wendover Tunnel will allow the reintegration of the land. However this benefit would be obtained by a fully bored tunnel throughout the AONB, without the significant temporary and permanent adverse effects.

7.5 deals with the impact of operations on ecology. 7.5.1 sets out three avoidance and mitigation methods:

- Wendover Tunnel will allow bats and other animals to safely pass over the railway
- The creation of planted embankments on roads, PRoWs and other crossing points will encourage them to fly at a safe height over the railway
- The Small Dean viaduct will allow bats and other animals to pass safely under the railway

All of these are true as such. However, the Wendover Tunnel does not help the Misbourne Valley. The Small Dean viaduct might help, but will not compensate for the embankments and cuttings, which are more than twice the length of the viaduct. The reality is that a fully bored tunnel would provide avoidance rather than mitigation.

7.5.3 / 6 sets out the serious risk of bats colliding with trains and /or disoriented by the passing noise. The conclusion sets out that this is dependent on the flight pattern of the bat species. This truism does not address the serious risk to bats from the new line

7.5.7 identifies that breeding bird densities can be reduced by noise, but dismiss the impacts of trains as they pass quickly. The assessment ignores the fact that with 18 trains per hour each way less than two minutes between each passing train, the noise will be continuous.

7.5.8 identifies that barn owls are likely to be killed by passing trains. 7.5.11 identifies putting up nesting boxes 1.5km from the line as a form of mitigation, in the hope that barn owls would find them.

Overall the ecological surveys are incomplete. They have been carried out in less than a year. Three full years are normally needed.

Better mitigation would be to tunnel to the north of Wendover and obviate any of these issues.

8 - Land Quality

8.2.3 identifies access constraints. Not all sites considered to have the greatest potential for contamination have been visited, and proposes to rely on a desk top study. This is not satisfactory in an AONB. All the sites should be visited and reported on to Parliament, before the second reading of the hybrid bill

8.3.7 The White Cretaceous chalk is designated as a principal aquifer by the Environment Agency. 8.3.8 The southern 3km will be located in a Source Protection Zone (SPZ) 8.3.9 identifies three Public Water Supply abstraction points in the CFA. The Government should consider an alternative route to avoid the risk to public water supplies.

8.3.23 Table 9 sets out receptors and their sensitivity. People, principal aquifers and Bacombe Hill SSSI are identified as receptors with High sensitivity. 8.4.2 sets out that further investigations will take place to in order to confirm the full extent of areas of contamination and a risk assessment. These studies should be carried out and reported to Parliament before the second reading of the hybrid bill.

9 - Landscape and Visual Assessment

9.2.2 describes the Zone of Theoretical Visibility (ZTV), but then excludes the temporary impacts of cranes and other large construction equipment, and more importantly excludes the impacts of the overhead line equipment on the view. The former is understandable, the latter is considered to be direct obfuscation. With the line running mainly on embankments and viaducts in the AONB, the catenary towers will be highly obtrusive. At night there will be a line of light flashes from the pantograhs and the carriage windows every few minutes as trains pass.

9.2.4 states that: access was limited. Professional judgement has been used to approximate the likely views from these locations. Is this acceptable in an AONB? We believe that the Environmental Statement should be completed, now that the Government has passed the Provisioning bill, which also gives the right to access land.

9.3.5 / 13 These set out 9 Landscape Character Areas. (LCA):

- The Lee Undulating Valley Slopes
- Wendover Gap
- Settlement (Wendover)
- Chiltern Scarp (Wendover West)
- Chiltern Scarp (Coombe Hill)
- Wendover Foothills
- Risborough Foothills
- Longwick Vale
- Southern Vale

Four LCAs have **not** been included in Vol 2 although covered in Vol 5 LV-000-010. These are:
- Great Hampden
- Chiltern Dip Slopes
- Chiltern Scarp (East)
- Wendover Foothills (East)

One of these is germane to the understanding of the impact on the Misbourne Valley. This is Great Hampden LCA, which includes Dunsmore, which is heavily impacted by the embankments and Small Dean viaduct.

Those in the Misbourne Valley, Wendover and the Chiltern Scarp are generally considered to be tranquil and have a high sensitivity to change. Wendover is considered to have medium tranquillity.

The assessment of Wendover Foothills is critiqued for having electricity pylons, and with these and its closeness to Wendover is assessed as having low tranquillity, despite the assessment of Wendover's tranquillity as medium.
A review of the winter and summer photographs from selected viewpoints shows these generally not to be views of the proposed route. As such are they relevant?

9.4.5 / 39 covers the temporary visual impacts on the area. The ES concludes that these will have major adverse effects in five LCAs and moderate adverse effects in four LCAs during a period of up to 7.5 years. All of the major adverse impacts and three of the moderate adverse impacts would be eliminated by a fully bored tunnel to north of Wendover.

9.4.44 / 148 evaluates the impact from various viewpoints

Viewpoint Ref	Area	Daytime Impact	Nighttime Impact
095.2.002	Wendover Dean	Major adverse	Moderate adverse
095.3.001	Wendover Dean	Major adverse	
095.3.002	Cockshoot Wood	Major adverse	
096.3.002	King's Lane	Major adverse	
096.4.002	Potter Row	Moderate adverse	
097.2.001	Wendover Dean	Major adverse	
097.2.003	Upper Wendover Dean	Major adverse	Moderate adverse
097.3.001	Bowood Lane	Major adverse	
097.4.001	Cobblershill Lane	Moderate adverse	
098.2.001	King's Lane	Moderate adverse	Moderate adverse
098.3.001	Bowood Lane	Major adverse	
098.3.003	Kings Ash	Major adverse	
099.2.001	Rocky Lane	Major adverse	Moderate adverse
099.3.001	Little Hampden	Moderate adverse	
099.4.001	Cobblershill Lane	Moderate adverse	
099.5.001	The Firecrest	Moderate adverse	Moderate adverse
100.2.001	Rocky Lane	Moderate adverse	Moderate adverse
100.2.002	Rocky Lane	Moderate adverse	Moderate adverse
100.4.001	Rocky Lane	Moderate adverse	
101.2.002	Dunsmore	Major adverse	Major adverse
101.2.003	Small Dean	Major adverse	Moderate adverse
101.2.004	Small Dean Lane	Major adverse	Major adverse
101.2.005	Rocky Lane	Moderate adverse	Moderate adverse
101.2.006	Small Dean	Major adverse	Major adverse
101.3.001	Icknield Way	Moderate adverse	
101.4.001	Dunsmore Lane	Moderate adverse	
101.4.002	Small Dean Lane	Moderate adverse	
102.3.001	Hogtrough Lane	Major adverse	
103.2.001	Ellesborough Road	Major adverse	Moderate adverse
103.3.001	Bacombe Lane	Major adverse	
105.2.001	Ellesborough Road	Major adverse	Moderate adverse
105.2.002	Wellwick Farm	Moderate adverse	Insignificant
105.3.001	Coombe Hill	Moderate adverse	
105.3.002	Aylesbury Ring west	Major adverse	
105.3.003	Bacombe Hill	Major adverse	
106.3.001	WEN/54	Moderate adverse	
107.2.002	Nash Lee	Major adverse	Moderate adverse
108.2.001	Nash Lee Lane	Major adverse	Major adverse
108.4.001	A413, Nash Lee	Moderate adverse	
109.2.001	Princes Risborough Road	Moderate adverse	Insignificant

109.4.001	Nash Lee Road	Moderate adverse	
	Major Adverse	23	5
	Moderate Adverse	18	11
	Insignificant		2

The above summarises the impacts on viewpoints as assessed by HS2. 15 of the major adverse day impacts and four of the major adverse night impacts are in the Misbourne Valley. This gives a good indication of the major impact construction would have on this peaceful part of the AONB.

9.5 sets out the permanent impacts. 9.5.2 sets out mitigation measures and sets out a view of the impact in 2026, 2041 and 2086, i.e. 60 years after the scheme opens.

9.5.6 / 27 sets out the landscape assessment by LCA. However only three of the LCAs are included

- Wendover Gap
- Wendover Foothills (West)
- Longwick Vale

For Wendover Gap the assessment sets out the impacts of the cuttings embankments and viaducts will result in a noticeable reduction in tranquillity.
9.5.10 concludes 'Therefore due to these changes which will be incongruous with the character of the area, the magnitude of change is considered to be medium in year 1 of operation.' This assessment is optimistic at best. A shallow valley in an AONB will have a major raised scar across it introducing regular extra noises from trains, and this is assessed as *moderate.* Frankly this is a ludicrous assessment.

Further more the assessment fails to take into account the impact of trains operating at night and in the early morning bringing light pollution with it, or the impact of maintenance being carried out between 12.00 and 5.00.

9.5.34 / 209 report on the impact on viewpoints

Viewpoint Ref	Area	Year 1 Impact	Nighttime Impact
095.2.002	Wendover Dean	Moderate adverse	Insignificant
095.3.001	Wendover Dean	Moderate adverse	
095.3.002	Cockshoot Wood	Moderate adverse	
096.3.002	King's Lane	Major adverse	
096.4.002	Potter Row	Moderate adverse	
097.2.001	Wendover Dean	Major adverse	Insignificant
097.2.003	Upper Wendover Dean	Major adverse	Insignificant
097.3.001	Bowood Lane	Major adverse	
097.4.001	Cobblershill Lane	Moderate adverse	
098.2.001	King's Lane	Moderate adverse	Insignificant
098.3.001	Bowood Lane	Moderate adverse	
098.3.003	Kings Ash	Major adverse	
099.2.001	Rocky Lane	Major adverse	Insignificant

099.3.001	Little Hampden	Moderate adverse	
099.4.001	Cobblershill Lane	Moderate adverse	
099.5.001	The Firecrest	Moderate adverse	Insignificant
100.2.001	Rocky Lane	Moderate adverse	Insignificant
100.2.002	Rocky Lane	Not assessed	
100.4.001	Rocky Lane	Moderate adverse	
101.2.002	Dunsmore	Moderate adverse	Insignificant
101.2.003	Small Dean	Major adverse	Insignificant
101.2.004	Small Dean Lane	Moderate adverse	Insignificant
101.2.005	Rocky Lane	Moderate adverse	Insignificant
101.2.006	Small Dean	Major adverse	Insignificant
101.3.001	Icknield Way	Moderate adverse	
101.4.001	Dunsmore Lane	Moderate adverse	
101.4.002	Small Dean Lane	Moderate adverse	
102.3.001	Hogtrough Lane	Moderate adverse	
103.2.001	Ellesborough Road	Moderate adverse	Insignificant
103.3.001	Bacombe Lane	Major adverse	
105.2.001	Ellesborough Road	Moderate adverse	Insignificant
105.2.002	Wellwick Farm	Not assessed	Not assessed
105.3.001	Coombe Hill	Moderate adverse	Insignificant
105.3.002	Aylesbury Ring west	Not Assessed	
105.3.003	Bacombe Hill	Moderate adverse	
106.3.001	WEN/54	Not Assessed	
107.2.002	Nash Lee	Major adverse	Insignificant
108.2.001	Nash Lee Lane	Major adverse	Insignificant
108.4.001	A413, Nash Lee	Not Assessed	
109.2.001	Princes Risborough Road	Moderate adverse	Insignificant
109.4.001	Nash Lee Road	Moderate adverse	
	Major Adverse	11	
	Moderate Adverse	25	
	Not Assessed	5	1
	Insignificant		18

The ES concludes that overall there will be a moderate adverse effect in Year 1. The above schedule contradicts that assessment.
This assessment completely underestimates the change in the landscape with deep cuttings from Mantles Wood to the south portal of the South Heath Tunnel, and loss of considerable woodland. The Society considers the change to be a major adverse impact.
Even in year 15 and year 60 there will be a substantial adverse impact, through creating a huge trench.
In addition the almost constant noise of trains night and day will reduce the level of tranquillity substantially. The assessment of light from operations as insignificant is to fail to understand the views of clear starlight nights that are normal in the Chilterns AONB. The reality is that at night there will be the intrusion of light flashing from the Pantograph, and lights from passing trains, not including the lights required for maintenance working

10 - Socio-economics

10.3.9 The quality of the assessment is shown by the comment that average unemployment in England was 7% in 2011, when according to the ONS it was 8.1%

10.4.3 states that: no non-agricultural businesses have been identified, which are expected to experience significant amenity effects from the proposed scheme. This completely ignores the impact of the scheme on

- People visiting the area
- Local businesses which rely on tourism, shops, restaurants, cafes
- Local businesses providing professional services such as estate agents and solicitors
- The adverse impact on business creation, due to traffic etc, with people choosing to set up business elsewhere
- The adverse impact of getting new employees because of the traffic disruption
- The impact on Wendover of between 175 and 245 single men looking for entertainment at night. This will almost certainly impact the existing local market for restaurants.

10.4.6 Construction employment is not necessarily a benefit. As the report recognises, unemployment is very low compared to the national average. Currently there is plenty of work in the area for people involved in the construction industry. The main impact of HS2 on the economic activity in the area therefore will be to allow contractors to increase contract rates.

10.4.16 / 18 tries to give the impression that there will be a net benefit to the area. However they have not identified the impacts set out above, or more cynically have chosen to ignore them.

11 - Sound Noise and Vibration

11.2.1 / 7 set out the baseline sound as measured by HS2. This shows that the baseline is generally 45db to 50db during the day, with some parts of Wendover impacted by higher sound levels. It also states that a night-time the sound level is generally around 10db less. This assessment ignores the note in Volume 1 that there are areas even greater tranquillity in areas like The Lee and the hidden valleys.

11.2.9 sounds reasonable as they are saying that they will assess against a background of 2012/13. However the real impact is the change in sound level that will take place whether it is during construction or with the introduction of trains.

11.3.5 states that: the assessment assumes the principles and management processes set out in the draft CoCP will be implemented. This is a big caveat, based on people's experience with HS1 in Kent

11.3.9 assesses that three houses on Bacombe Lane and 10 houses on Ellesborough Road will be subjected to noise in excess of 75db during the day. Table 13 shows 5 and 20 houses impacted. Which is correct?

As these two roads bracket Bacombe SSSI, one would assume that this will also be impacted by loud noise. This does not appear to be reported as an adverse impact in the Ecology section.

11.3.15 identifies a severe impact of 60db on Wendover House School, St Mary's Church and the Witchell Road Community Centre. 11.3.21 states that HS2 Ltd will continue to seek ***reasonably practicable*** measures to further reduce or avoid these significant effects. In doing so HS2 Ltd will continue to engage with stakeholders to fully understand the receptor. It would seem reasonable that if a proper Socio-Economic Survey had been done this would already be known.

11.4.2 sets out the expected train schedule with up to 18 trains per hour each way between 07.00 and 22.00, effectively a train less than every two minutes. This will provide an almost constant elevated sound level. The bigger intervals before and after the peak hours will create a greater rise and fall in the noise level compared to the ambient noise, and at a time when people will be trying to sleep.

11.4.4 talks about avoidance and mitigation measures, claiming that the development of the proposed scheme has, as far as ***reasonably practicable***, kept the alignment away from main communities and low in the ground. This is completely untrue as in this CFA, where there are viaducts (as high as 18m) and embankments. This again raises the question of what ***reasonably practicable*** means. It is quite ***practicable*** to build a fully bored tunnel to the north of Wendover. However it might not be ***reasonably*** cheap.

11.4.5 claims that: new technology and improved track laying methods will reduce the train noise by 3db. Obviously this has been used in the assessment, but seeing the issues with Chinese high speed trains, is it reasonable?

11.4.15 states that: the Interim Target defined by the World Health Organisation Night Noise Guidelines for Europe is set at a lower level than those set out in the Noise Insulation (Railways and other Guided Transport Systems) Regulations 1996. However HS2 still seeks to use the levels set out in the Regulations.
As the WHO target is an Interim Target, the noise levels used in assessing the impacts of HS2 need to be set at a lower level than the Interim Target. E.g. 5db below.

11.4.16 states that: ground borne vibration will be avoided or reduced through the design of the track or track bed. This needs to state **will be avoided**. The word 'reduced' is another let out for the contractors and designers.

11.4.37 sets out that the WHO interim Target is 55dB. However on reading the relevant WHO document the target is 55dB,Lnight, outside, which means that the average noise should not exceed this outside a building at night, which is defined as 23.00 to 07.00. This interim target compares with Night noise guideline of 40 dB, Lnight, outside. The interim target is supposed to be used only in exceptional circumstance. The guide also says that health is adversely affected when there is noise exceeding 40dB,LAmax.inside. Examples given of events that cause this are aircraft and trains. The conclusion from this is that the standards being used by HS2 are too low, particularly as the Proposed Scheme will not be in operation until 2026, when the WHO targets will be mandatory.
Of course these issues would not exist with a fully bored tunnel to the north of Wendover.

12 - Traffic and Transport

12.2.1 The assessment in Volume 1 is inadequate. The rush hour is defined at 08.00 to 09.00 and 17.00 to 18.00 in CFA 9. As recognised in the Community analysis a lot of people in CFA 10 commute to work. Many of the commuters use their cars either to get to a station or to drive to work. The A413 both south and north of Wendover are very busy from 6.30 onwards to around 9.15. For Wendover the morning rush starts before 07.00 with trains running every 16min from around 6.30. These trains pick up a large number of passengers at Wendover. Commuters come from all around the area, north, south, east and west. There is another commuter surge between 09.00 and 09.15 for the first train with reduced fares. The schools in Wendover, start receiving children from 08.15 until 9.00, with many of the children being brought by car. Because of the grammar school system in Bucks, children in CFA 10 and the wider area around Wendover attend secondary schools in Wendover and in Aylesbury mainly by bus. These buses are on the road from before 08.00. The afternoon rush hour commences around 15.00 with children being picked up from primary school. This continues through to 16.30. Commuters start to return around 17.00, arriving both by car and rail. The rush starts to decline around 19.00.

12.2.4 talks about the bus routes, but ignores the impact of school buses. Wendover House a school for children with emotional and behavioural issues draws pupils from across South and Mid Bucks arriving by taxi.

12.2.5 seeks to play down the impact of HS2 on traffic flows, but as the baseline is so inadequate, the study certainly fails to estimate the impacts realistically.

12.3.3 talks about PRoW surveys to establish footpath use. These were carried out during a very short period. The assessment needs to be carried out over a much longer period to get a true assessment.

12.3.4 sets out the roads believed to be affected. This however fails to take account of the pressure on Wendover caused by traffic issues especially on the A413 Wendover bypass.

12.3.6 sets out the buses on routes surveyed, but ignored Route 50 Aylesbury, Wendover, Halton to Ivinghoe, which uses the A413 north of Wendover.

12.4.1 sets out avoidance and mitigation methods. However many of these are not used in CFA 9. The haul route map TR-03-054 shows clearly that the haul routes will all be on local roads, with no haul roads along the route. HGVs will use designated routes that are ***reasonably practicable***. What does this mean?

12.4.2 states that: the draft CoCP include measures which seek to reduce the impacts and effects of deliveries of construction materials and equipment. As the rush hour has been incorrectly defined, such measures will be redundant.

12.4.3 states that: a travel plan will be put in place. Again this is more of a hope and a prayer than any real solution.

12.4.9 Table 17 sets out the construction sites in CFA 10.and the traffic movements. This indicates the impact on various roads in CFA 8, 9 and 10.

Road	CFA	Min Cars LGVs	Max Cars LGVs	Min HGV	Max HGV
A413 South	8	80	100	90	100
A413 South	9	390	490	150	210
A413 South	10	650	810	170	230
		1120	1400	410	540
B485	9	310	400	100	150
B485	10	200	260	170	230
		510	660	270	410
Potter Row	10	200	260	30	40
Rocky Lane	10	180	210	50	70
Small Dean Lane	10	270	340	90	120
A413 North	10	50	110	40	90
B4009	10	50	110	40	90

The above table shows the cumulative impact on the A413 from activities in CFA 9 and CFA 10. The assessments are optimistic because of failure to assess the rush hour properly. The likelihood is that the A355 to Beaconsfield will take the majority of vehicles on the A413.

12.4.13 identifies the junctions that will have a major adverse effect. The majority of these relate to the A413 South of Wendover. However it does not highlight the impact on the A413 and B485.

12.4.14 sets out the temporary road closures. Bacombe Lane generates little traffic, but the closure of Small Dean Lane will add traffic to the already stressed A413.

12.4.15 identifies the roads which will be severely impacted. However it fails to highlight the impact on Potter Row from works in CFA10.

12.4.19 draws the conclusion that the effect on accidents will be insignificant. However with a significant increase in traffic and the amount of HGVs on the road it is likely that accidents will increase substantially.

12.4.20 identifies impacts on PRoWs and identifies a moderate adverse impact due to a 2.2km diversion of the Icknield Way. This fails to recognise the impact of the Proposed Scheme on visitors who come to the area to walk and cycle.

12.4.21 claims there will be no impact on bus services. However as the ES failed to identify

school buses and the rush hour definition is inadequate, this conclusion is suspect.
More work is needed over a longer period.

12.4.22 identifies that the construction of the proposed scheme will require some temporary rail possessions of both the lines to Marylebone via Princes Risborough and Amersham. These are claimed to be either at night or on weekends, and therefore have no significant effects, but could impact rail users using Wendover. Also see 12.4.28, which uses ***reasonably practicable***, and states that rail replacement services will be provided where necessary when rail possessions are in place. Taking this with the inadequate rush hour definition, this is more than a suspect conclusion.

12.4.23 / 25 deals with cumulative effects, and that flows from CFA 9 and CFA 11 have been included in assessment. The table above at 12.4.9 shows that there is a significantly greater impact on CFA 10 than assessed. In particular access routes to the various sites show a wide variety of access routes, the site tables show significantly less routes. See also Volume 5 Technical Appendices. 11.2.5 & 6.

13 - Water resources and flood risks

13.1.3 sets out key environmental issues relating to water resources and flood risk, in particular the risk to groundwater quality and the risk of a substantial reduction / change affecting the Weston Turville SSSI.13.2.3 states that site visits were undertaken the Weston Turville SSSI and numerous springs in and around Wendover. 13.3.9 Table 19 sets out the geology of the CFA with assessments of water quality.
13.4.8 states that drainage of the Wendover Tunnel could intercept groundwater feeding the springs which feed the Weston Turville SSSI, giving a moderate adverse impact. It also states that when the tunnel is completed, the groundwater flow would return to previous flow paths. . As stated below the intercept of the groundwater table by the Wendover cut and fill tunnel will be at about 10 metres. This flow will not be able to return to its original pathways as they will have been destroyed by the digging out of the cutting. **So these two paragraphs are contradictory**. The springs discussed in 13.1.3 will be potentially permanently disrupted, until the water flow from the Wendover tunnel finds a new pathway. This may never happen.

13.4.9 indicates that the Wendover North Cutting will interfere with the flow of groundwater to the head of the Stoke Brook. Intent to return water from drains to the Stoke Brook 1km downstream.13.4.23 / 24 admits risk of turbidity from pile-driving, but will be diluted in the aquifer. 13.4.25 admits there could be a serious impact of turbidity on Public Water Supplies. The claim there are no works below the water table, has not been substantiated.

The key problematic zone in this CFA is the Wendover “Green Tunnel” and associated cuttings. As indicated under the discussion of CFA9, the term Green Tunnel is a misnomer in that such constructions are no more than cuttings which have been backfilled following tunnel emplacement. Where such cuttings transect ground below the level of the water table there is the potential risk of flooding.

CFA 10 Appendix WR003-010 (Flood risk assessment), Section 6.4.4 (p.17) states that “*there is the potential for the Wendover green tunnel and the Wendover north cutting.....to act as groundwater sinks, with excavation up to 10 m below potential groundwater levels. There is a significant risk of flooding to these elements from the bedrock groundwater*”. By p.24 of the

same document (section 8.4.1.) the impact on risk of flooding from groundwater indicates that there is "*potential*" for the tunnel and cutting to obstruct groundwater flow "*<u>if</u> below the water*". It states further that "*the susceptibility of groundwater emergence from the Chalk aquifer at natural ground level is relatively low*". These statements are both contradictory and misleading.

This tunnel and cutting will be excavated through the Grey Chalk Group. This well defined geological unit (Bailey & Wood, 2010) comprises a series of alternating claystone and limestone beds. The latter are well known throughout this region to act as major groundwater conduits, with important limestone beds (Dixoni and Doolittle Limestones) being the sources of numerous springs along the basal Chiltern escarpment. Groundwater flow should be expected to be concentrated at these levels and should they be transacted within the tunnel and associated cuttings they are likely to result in long term water ingress and heightened flood risk. This potential risk is effectively hidden, if not dismissed, in the Environmental Statement and shows a lack of knowledge regarding the local geological conditions and its impact on groundwater flow.

Volume 3 Route-wide effects

2 - The Chilterns Area of Outstanding Natural Beauty

2.1.3 States National planning policy regarding AONB is set out in paragraphs 115 and 116 of the National Planning Policy Framework (NPPF)3, which outlines that great weight should be given to conserving landscape and scenic beauty in AONB, with the conservation of wildlife and cultural heritage being important considerations. The NPPF goes on to state that planning permission should be refused for major developments within AONB except in exceptional circumstances, where a demonstrable need in the public interest must be presented

To date the government has not made a defendable argument that HS2 is in the Public Interest, and /or demonstrated why the Proposed Route should go through a designated area.
There is arguably a public need to improve capacity on the railways, including to the North of England. However there are alternatives which will provide similar capacity earlier, such as

- 51m's 'Optimised Alternative' which delivers the same capacity as HS2 for £2bn, and delivering this considerably earlier.
- Alternative routes, which avoid the AONB

In particular they have failed to demonstrate why an alternative route avoiding the Chilterns AONB should not be used.

2.2.2 States that field surveys were undertaken between July 2012 and July 2013 to establish the baseline landscape character of the AONB.
The reports on CFA 6,9,10 all show that HS2 Ltd failed to access much of the land along the Proposed Route. This throws further doubt of the reliability of the assessments included in the ES

2.2.3 Sets out that the study area as the boundaries of the AONB. It also defines the zone of theoretical vision (ZTV). What it fails to mention is that in a substantial number of cases, HS2 was unable to access land in the ZTV to complete a proper survey.

2.3 - Landscape Baseline

2.3.2 mentions a number of important points in that

- much of the woodland is classified as ancient woodland
- dense network of ancient hedgerows
- two registered parks are on the line i.e. Shardeloes Park and Missenden Abbey

2.3.4 points out that the landscape is ancient and includes the Ridgeway National Trail and the Icknield Way, one of Britain's oldest tracks.

2.3.5 Acknowledges that there is an extensive network of Public Rights of Way throughout the Chilterns. It also notes that the majority of the scheme follows the Misbourne Valley stating that the valley is a road a rail corridor. This implies that this is major transport corridor when it is a two-lane road and a railway branch line to Aylesbury, with ~~a~~ trains generally running every half-hour.

2.3.9 identifies that approximately 1% of the Chilterns is open chalk grassland, of which Bacombe Hill SSSI and Coombe Hill are areas close to the scheme.

2.3.10 identifies that 21% of the Chilterns is woodland of which of which two thirds are classified as ancient woodland. The extensive network of PROWs make much of the woodland accessible to the public.

This makes the area very attractive to walkers and cyclists, who access the AONB from Chiltern Line stations at Amersham, Gt Missenden and Wendover. These visitors make a significant contribution to the vibrancy of local businesses.

2.3.12 notes that human habitation dates to pre-history with settlements either in the river valleys near water or small settlements on the higher land, joined by a network of minor roads, including sunken lanes.

2.3.13 notes the pattern of hedgerows, ancient woodland, sunken lanes, hill forts and chalk figures.

What it fails to mention is the evidence of Roman villas, ancient earthworks and other evidence of human habitation going back into pre-history.

2.3.14 Sets out that the PROW network includes more than 2,000 km of footpaths, including two national trails and several other routes.

It fails to mention that the network is integrated, so that people can access and travel over routes of their own. Loss of connectivity plus construction work will substantially reduce the number of visitors to the AONB, in particular to the Misbourne Valley. It also fails to mention the substantial access for cyclists.

2.3.15 Mentions chalk streams, but fails to mention that they are a rare habitat globally. The Proposed Scheme in the AONB risks the loss of the Misbourne.

2.3.16 Mentions tranquil valleys, but then tries to denigrate the tranquillity. The reality is that the Proposed Scheme will cross a tranquil landscape, bringing visual, light and noise pollution to 13km of high quality nationally designated - and protected - landscape.

2.3.17 Describes the existing farmland, and admits that it provides a good variety of habitat, including field margins, species rich hedgerows, ponds, woodland and orchards.

2.3.18 describes the condition of the landscape as considered to be good.

One might ask who considers it good. As it is an AONB, the conclusion drawn by Parliament is that it is excellent.

2.3.19 Intimates that parts of the AONB are not tranquil. While there is some variation in the level of tranquillity, the Misbourne Valley, which is crossed by the Proposed Scheme, is tranquil and suffers little light pollution, noise etc,

2.3.20 This section seeks to claim that the majority of the areas close to the Proposed Scheme have low to medium tranquillity, due to influences from Amersham, the A413, the M25 and the Chiltern Line.

The reality is that from the M25 to 3km north of Amersham is in tunnel. The tranquillity of the AONB will be shattered from near Hyde Heath to Wendover by the Proposed Scheme which will be on viaducts and embankments for most of this distance, with up to 36 trains per hour passing. The Chiltern Line has a maximum of eight relatively slow and quiet trains per hour. The A413 generates little noise outside of the morning and evening commuter rush hours. While it highlights a few areas of high tranquillity, it ignores the area around Hyde Lane, Hyde End, South Heath and Potter Row, where the greatest impact of the Proposed Scheme will occur.

2.3.21 Admits that the landscape is of national value.

2.3.26 talks about committed developments in the Misbourne Valley. Only one of those listed is impacted by the Proposed Scheme. This is Wendover House School, which is redeveloping part of their site near Wendover. This sits in low land south of Wendover, and is well screened with trees. This school will be within 300m of the Proposed Scheme and will be heavily impacted by noise and light pollution. The school caters for children with emotional and behavioural difficulties.

2.3.27 Describes the committed development of a dairy complex, which is situated over 2km from the Proposed Scheme, and well away from the northern boundary of the AONB.

The overall impression from reading the Landscape Assessment is that the author/s are trying to downplay the quality of the Misbourne Valley, Arguments deployed later, seek to downgrade the environmental damage done to the AONB, by claiming that

- The Misbourne Valley represents only 1% of the AONB
- Ancient woodlands being destroyed is mitigated by the fact that there is a lot of ancient woodland in the AONB
- A similar argument is used for the loss of BMV farmland
- A similar argument is used for the loss of woodland, in that the Misbourne Valley is 18 to 19% woodland compared with a national average of 10%
- The loss of barn owls is minor as represents 2% of the UK owl population.

The reality is that the Misbourne Valley is at the heart of the AONB, and that the Scheme proposes to pass through the widest part of the AONB.

2.4 - Description of Proposed Scheme

2.4.2 describes the 11.3km Proposed Route from Hyde Heath to north of Wendover, where it leaves the AONB. Of this 11.3km,

- 3.3 km will be on viaducts and embankments across the most open part of the valley.
- 2.5km of cut and cover tunnels have been provided at South Heath and Wendover.
- 5.6km will be in cuttings

The viaducts, embankments and cuttings will be a livid scar across the face of the Misbourne Valley.

This section also describes a ‘sustainable placement area’ at Hunt’s Green Farm, which is described as being 1.3km long, 450m wide and 5m high. The farmer has recently been contacted by HS2 saying that the heap will, in fact, be 9m high. No explanation of where this

additional spoil is coming from was offered. It has now been established that spoil from areas up route at Waddesden and Quainton will be moved to be dumped on this land. There are also other large-scale landscaping areas planned to enable more spoil to be utilised elsewhere along the proposed route.
Reshaping the landform on this scale is unacceptable in an AONB.

2.5 - Temporary effects arising during construction

2.5.10 sets out the impacts of the construction

- temporary presence of construction plant etc
- temporary work sites and compounds
- temporary disruption of the PROW network and land access
- permanent demolition of properties
- permanent removal of existing landscape features
- permanent reduction in tranquillity
- permanent earthworks
- permanent structures e.g. viaducts

2.5.11 states this will be largely limited to the north-west extent of the Misbourne Valley which shows how significant the impact will be on this comparatively small area.

2.5.12 Tries to play down the impact on Bacombe Hill, which is an SSSI of national importance.
The argument that this is only a small part of the escarpment is deployed to attempt to reduce the impact.

2.5.13 The flower rich meadowland on Bacombe Hill SSSI will be temporarily impacted during construction.
The reality is that the building of the Wendover tunnel will come within 25m of the SSSI. This will take four years to construct, with much of the trace being a haul road for that time. This will introduce a substantial reduction in the air quality for a long period, with unknown impact on the SSSI.
The Small Dean viaduct will result in a permanent significant reduction in tranquillity for this SSSI.

2.5.14 Attempts to play down the importance of the loss of ancient woodland. It does admit that it is irreplaceable, and these losses will noticeably alter the character of the Misbourne Valley. It goes on to say 'However, these losses will not be perceived beyond the confines of the valley due to the enclosed nature of the valley and widespread presence of intervening vegetation'.
The enclosed nature of the landscape is part of the high value of the landscape in the AONB. This again demonstrates both the highly significant impact of the Proposed Scheme, and the attempt to downplay that impact.

2.5.16 admits the loss of hedgerows and part of Grim's Ditch, a scheduled ancient monument. It further states that sunken lanes (a key feature of the landscape) will be realigned, effectively destroying them.
These changes will have a significant impact on the landscape, as well as the loss of part of our history.

2.5.17 talks about the loss of properties, and concludes that a number of settlements will be perceptibly impacted by construction traffic.

2.5.18 concludes that Shardeloes Park will be impacted during construction of the Little Missenden vent shaft.
It does not address the risk of the loss of Shardeloes Lake through the tunnelling activities under the northern end of the lake. The loss of the lake would be a permanent major adverse impact.
Also this paragraph has not referred to the impact on approximately 550 Grade I and Grade II listed buildings in the Misbourne Valley that are impacted by the Proposed Routes, either directly or in ZTV.

2.5.19 seeks to argue that as the losses and impacts would be in the Misbourne Valley that the impact on the AONB is limited. What has been ignored is that the Misbourne Valley is in the centre of the Chilterns AONB and at its widest part. The Proposed Route effectively cuts the AONB in two resulting in the loss of the AONB's feeling of integration.

2.5.20 argues that although there will be temporary and permanent realignment of a number of PROWs, and that they will be noticeable locally, however as the changes are nearly all in the Misbourne Valley, that the harm will be limited.
This is another example of trying to down play the impact of the Scheme.
The loss of recreational value, tourism and the resulting economic impacts have not been recognised in the economic evaluation of the Proposed Scheme.

2.5.21 claims there will be no direct impact on chalk streams however the River Misbourne is a chalk stream fed from aquifers under the Misbourne Valley. The Proposed Scheme will pass in tunnel under the River Misbourne, just north of Shardeloes Lake. No geological testing has been completed to determine the underlying rock formations. The aquifer is known to be fractured, and there is a severe risk of the Misbourne disappearing completely.
In addition the design of the three vent shafts in CFA8, includes a provision to transfer some discharge from dewatering to the River Misbourne. It does not address the issue of water quality or the cumulative impact of discharges from the three vent shafts.

2.5.22 tries to play down the impact on tranquillity, by referring only to two construction sites, whereas there are a number of sites which will impact on tranquillity.
The impact on the tranquil valleys around Hyde Lane and South Heath have been completely ignored.
The amount of construction traffic will substantially reduce tranquillity throughout the Upper Misbourne Valley.
The construction of the Small Dean viaduct and the Wendover tunnel will substantially impact the tranquillity of the Bacombe Hill SSSI.

2.5.23 seeks to argue that the loss of 400ha of farmland and the removal of 40km of hedgerows is a small amount in the farmland and hedgerows in the AONB.
Loss of any farmland, particularly Best and Most Versatile (BMV) land, is serious in the UK, where we are very short of land. The loss of hedgerows has a significant impact on wildlife.
The dumping of spoil at Hunt's Green Farm will mean that it will be many years before the land is restored to agricultural use. The latest information on the amount of spoil involved

indicates that it will be to a height of 9m suggesting that it will probably never be returned to agricultural use.

Assessment of Effects during Construction

2.5.24 concludes that the construction activity will substantially but temporarily alter the character and appearance of the landscape in the vicinity of the Proposed Scheme, including the intensive activities related to the Wendover Tunnel and will have an impact on Bacombe Hill, Coombe Hill and Boddington Hill.

2.5.25 Identifies the impacts on the AONB through the removal of 10.8 ha of Ancient Woodland, the loss and severance farmland, the loss of hedgerows and sunken lanes however it omits the impact on the setting of 550 Grade I and Grade II listed buildings in CFA 8, 9 and 10.

2.5.26 Maintains that areas with a high level of tranquillity will not be noticeably affected, with the exception of Wendover Dean, and accepts that areas of medium and low tranquillity will be impacted but considers this will not give rise to a substantial impact on tranquillity.

Other areas of high tranquillity such as Hyde Lane and Potter Row have been ignored. Overall this is a complete under-assessment of the impact throughout the Upper Misbourne Valley.

2.5.27 Concludes that there will be substantial local impacts, and a major adverse effect locally on the landscape character and special landscape qualities of the AONB.

2.5.28 Seeks then to play the impact down by stating it is limited to the landscape in the Misbourne Valley, although there will be a medium adverse impact on the AONB per HS2 Ltd's own assessment

2.6 - Permanent effects arising during operation

2.6.2 sets out avoidance and mitigation measures, claiming that putting the Proposed Scheme in a cutting and using earthworks and landscaping integrates it into the landscape. It further states that replacement planting of hedgerows and woodland will help integrate or hide the Proposed Scheme.

This totally ignores the fact that the landscape here is protected. It further ignores that the deep cuttings run like a scar through the countryside.

2.6.3 Sets out the impacts on the AONB

- New engineered landforms
- Two new viaducts 18m and 12m high, with associated infrastructure
- Noise barriers will create linear man-made features
- Permanent severance of land
- New highway infrastructure, including road bridges
- Presence of overhead line equipment
- Presence of regular high speed trains
- Noticeable loss of vegetation

There is a failure to recognize the impact on wildlife, through loss of hedgerows and woodland.

2.6.4 Claims that as these impacts are limited to the Misbourne Valley and that there is little overall impact on the AONB.

This argument fails to recognize that the Misbourne Valley is at the heart of the AONB. All of the impacts could be avoided by a fully bored tunnel through the AONB to north of Wendover.

2.6.7 States that there will be a minimal impact on the chalk downlands of Coombe Hill and Bacombe Hill in year one of operation.

This ignores the impact of noise and light from the Small Dean viaduct which will impact Bacombe Hill severely and the visual impact of the rail infrastructure looking South East across the Misbourne Valley which will be severe.

2.6.8 This assesses that there will be little impact by Year 15 however it ignores the views from Bacombe Hill and Boddington Hill over the Misbourne Valley, where the infrastructure will be in plain view.

2.6.9 Agrees that there will be change to the landscape through the loss of woodland, particularly 10.2 ha of ancient woodland.

Again it tries to play down the impact by stating that it only impacts on the Misbourne Valley.

2.6.14 Agrees that in year one of operation, there will be a noticeable impact on South Heath, Hyde Heath and Wendover as they will be affected by new highway infrastructure, loss of buildings and the installation of three tunnel portals. There will be a noticeable impact on Wendover Dean and Kings Ash, with passing high speed trains and the highly visible and intrusive overhead infrastructure.

However the visual impact of the viaducts and embankments is ignored, as has the impact of light at night.

2.6.15 Tries to say that in year 15 the historic field patterns will have returned other than for the presence of the Proposed Scheme however it is likely that these field patterns would be lost forever.

2.6.17 States that there will be an impact on the network of footpaths, and in particular the recreational value of the AONB landscape. Again it tries to diminish the impact as it will only affect a small part of the AONB.

2.6.18 Admits that the impacts on PROWs will be the same in years 15 and 60.

2.6.19 Claims there will be little or no impact on the River Misbourne however this fails to recognize that the tunneling under the Misbourne could completely change the flow of water through the aquifer, with a loss of the river.

2.6.21 tries to understate the impact on tranquility by concentrating on tranquil valleys yet more than half of these have not been identified.

2.6.22 States that impacts on tranquil valleys will be diminished by planting mature trees however this ignores the impact of noise and light from operations on Wendover Dean and other areas such as Hyde Lane.

2.6.23 States that the loss of 180ha of farmland, excluding Hunt's Green Farm where 37ha will be unavailable for years, would have little impact on the AONB. This is quite clearly not true as the loss would indeed be significant.

Assessment of effects during operation

2.6.25 Again uses the argument that as it is limited to the Misbourne Valley. However it concludes that in the vicinity of the Proposed Scheme they will be at variance with the existing character and will discernibly alter the special landscape qualities, natural beauty, pockets of tranquility, landscape character and setting of the AONB, resulting in a major adverse effect locally during year one of operation.

2.6.26 Despite earthworks and landscaping remaining impacts on the special landscape qualities and natural beauty of the landscape will be associated with highly visible structures including viaducts and the changes to the existing vegetation pattern.

2.6.27 Specific Impacts

- Presence of new infrastructure, viaducts, tunnel portals, road and pedestrian overbridges, noise fence barriers, fencing, high speed trains and overhead line equipment
- Loss of woodland, incl 10.2 ha of ancient woodland
- Loss of farmland
- Severance of farmland
- Loss of hedgerows
- Loss of parts of sunken lanes
- Loss of part of Grim's Ditch, a scheduled Ancient Monument

2.6.28 claims that while the presence of the Proposed Scheme substantially alters the landscape in the vicinity, the impact on the special landscape qualities and natural beauty of the AONB have been avoided and reduced where practicable through the implementation of mitigation measures.

This is palpably untrue.

2.6.29 States that as only one valley in the AONB is affected, the magnitude of change is medium

2.6.30 States that the medium magnitude of change, assessed alongside the high sensitivity of the AONB, will result in a moderate adverse effect during year one of operation, which is considered to be significant.

2.6.31 Year 15 assessment still shows significant impact.

The impacts of the Proposed Scheme on Landscape are set out above, and even HS2 Ltd recognises that the magnitude of change would be severe locally and would have a medium adverse impact on the AONB. This is despite making every effort to downplay the impact. However a number of facts have been omitted:

- Failed to identify a number of tranquil valleys
- The impact on the views from Babcombe Hill SSSI in operation
- The impact on the Setting of 550 Grade I and Grade II listed buildings

- The impact of light pollution
- The risks to the River Misbourne, a globally rare chalk stream

They have also not included the impact on wildlife through severance of the hedgerows and loss of ancient woodland, the risk to Barn Owls both during construction and operation.

These major impacts would be removed completely by re-routing the Proposed Scheme and avoiding the AONB altogether.
If this is unacceptable then the majority of adverse impacts could be avoided by a fully bored tunnel from the M25 to north of Wendover.

3 - Agriculture, forestry and soils

3.1.1 Sets out the requirements in NPPF in particular avoiding, where possible, the use of BMV land.

3.1.4 States that efforts have been made (particularly during the HS2 London to the West Midlands Appraisal of Sustainability (AoS) process) in selecting the route alignment to avoid the highest quality land. This seems at odds with the overall approach of the AoS, which failed to adequately assess routes which followed existing infrastructure such as motorways or existing rail lines. Logically this would have reduced the use of BMV land.

3.2.1 Construction requires 4,800 ha of farmland, of which 2,500 ha are BMV

3.2.2 Adopts the same attitude to measuring impact on BMV land as in assessing the AONB. As there is a lot of BMV land in the UK, it is a resource of medium sensitivity. This would be subjected to a medium impact giving rise to a moderate adverse effect.

3.2.3 Seeks to argue that putting the topsoil aside and replacing on top of spoil after construction will maintain the qualities of the topsoil. This is a dubious argument, as soil interacts with the subsoil. Where the subsoil changes there is bound to be a change in the properties of the topsoil.

3.2.4 States 2800 ha of land will be permanently taken of which 1500 ha is BMV.

3.2.5 admits that this will give rise to a moderate adverse effect, which is significant.

Overall, in our opinion, the loss of a substantial amount of BMV farmland during construction (2,800 ha), and permanently (1,500 ha) represents a major adverse impact of the Proposed Scheme.

4 - Air quality

4.1.1 States that the main impacts on air quality will be from dust at construction sites, and additional emissions from construction related transport. Measures to control dust are set out in the Code of Construction Practice, and that if applied properly, dust will not leave the construction sites. Judging by what happens on ordinary construction sites this is no more than a hope and prayer. To make these effective, local authorities

would need to be given the power to monitor performance and to demand adherence with threats of substantial fines for failing to do so.

4.1.2 Talks about the relative impact of construction traffic as being relatively small in comparison to existing local emissions. This very much depends on the existing conditions. In the Chilterns, there will be a noticeable impact with the large amount of construction sites and the low population density.

4.2.3 The DfT figures for emissions per passenger km are dubious at best. Intercity rail is shown as 0.180 gm NOx, and HS2 is shown as 0.031 gm NOx. HS2 will require approximately 3x the power needed to run an electrified intercity train. Extending intercity trains to 12 carriages will provide nearly the same capacity as an HS2 train. Logically the NOx per passenger/km will be higher for HS2 compared to an intercity train.

It is understood that the power requirements are still being worked on but that there will be a requirement for additional power along some of the route. This is estimated as the equivalent output of two small medium gas fired power stations. The cost (estimated at £1bn) of providing additional electricity capacity for HS2 has not been included in the scheme costs.

5 - Climate

No comment, other than comparative figures for classic rail, are predicated on average emissions across the network (5.1.9), whereas the comparison should be against the alternative of intercity rail powered by electricity.

Carbon savings are based on the carbon intensity of the National Grid (5.5.1) . The question to be answered is whether the existing National Grid has the spare capacity for HS2, taking into account the growth in demand for electricity. If further capacity is needed, the capital cost of providing such capacity should be included in the capital costs of HS2.

5.7.2 draws a conclusion that the benefits arising from constructing HS2 are unlikely to arise from an alternative rail scheme that adds no strategic capacity. However, as the wording indicates, no such comparison has been made. 51m's 'Optimised Alternative' is capable of delivering the same capacity as HS2, at a fraction of the cost. This should be used as a benchmark for HS2.

Table 5 after 5.8.1 makes ambitious assumptions about the reduction in carbon from transfer of freight to the railways. This same transfer should be used when looking at the 51m 'Optimised Alternative' as this also provides significant improvements in freight pathways. The difference is that the HS2 proposal does not include the capital costs of the modifications that are needed to deliver the additional pathways.

6 - Community

The analysis on the route-wide impact on communities is inadequate. During the construction period, there are many route-wide impacts, particularly on commuting, inter-connectivity of communities, loss of business in affected communities, education, health services etc
As an example we deal with the impacts in the Chilterns AONB

Commuting:
Across CFA 7, 8, 9, 10 the 'rush hour' is defined as 8.00 to 9.00 and 17.00 to 18.00. The reality is that the 'rush hour' in most communities is 06.45 to 09.15 and 15.00 to 19.30. The morning begins with commuters catching trains into London. This impacts the stations at Aylesbury, Stoke Mandeville, Wendover, Great Missenden, and Amersham. It finishes with commuters arriving for the first 'cheap' fare of the day e.g. 09.20 at Gt Missenden. There are also a number of people driving into London and towards Aylesbury. In addition, the Buckinghamshire education system and the spread of communities mean that there ~~are~~ is a large number of school buses on the road, collecting and delivering children to their schools. This means that a number of roads, particularly A413, are extremely busy during ~~this~~ peak times. The evening 'rush' hour starts with children being picked up from local infant ~~schools,~~ and middle schools, and then older children returning by bus around 15.00. The working population then starts to come home both by road and rail.

Inter-connectivity of Communities

The studies in the CFAs failed to look at this aspect, particularly as the survey was for only one km either side of the proposed route. This missed looking at the impact of inter-connectivity, such as professional services, specialist businesses, shopping and particularly sports clubs.

Loss of business in affected communities

It is likely that there will be a loss of tourists put off by the widespread construction activity. A good example is the Roald Dahl Museum in Great Missenden which attracts visitors from a wide area.

The loss of employment opportunities from new start-up businesses

There is a high level of the creation of new businesses in the Chilterns. There is a high risk that this level of business creation will drop considerably in the communities along the Proposed Route. This would be detrimental to the vibrancy of the local economy and increase the need to commute longer distances to work.

Education

The impact of traffic congestion ~~causing~~ will mean that school children will need to leave home earlier and arrive home later which will be detrimental to their studies.
Some schools such as Stoke Mandeville Primary are close to the line, and the traffic congestion will cause severe disruption to education.

Health

The only Accident and Emergency Unit in the area is based at Stoke Mandeville**.** There is also a major maternity unit based there, These provide services to High Wycombe, Amersham, the Chalfonts, Chesham, the Missendens, Prestwood etc , as well as to Aylesbury, Princes Risborough and many other local communities.
The Proposed Scheme would run very close to Stoke Mandeville Hospital on the edge of Aylesbury, and will require some road closures as well as a number of alterations and re-routings.

Many towns including Amersham, the Chalfonts, Chesham, the Missendens, Prestwood rely on the A413 for access to Stoke Mandeville Hospital. This road will be significantly affected by construction traffic, with the risks of severe and life-threatening delays.
Other communities including High Wycombe, Princes Risborough etc rely on the A4010 as an access route to Stoke Mandeville. This is defined as a main access route to sites in the Wendover and Stoke Mandeville area with the likelihood of severe and life-threatening delays.

7 - Cultural heritage

This section rightly states that heritage assets can be affected through the physical removal of the asset or changes to its setting due to the development.. It sets out the impact on heritage assets to be demolished and /or partly demolished, including 18 Grade II listed buildings.
What it fails to do is to highlight the significant number of Grade I, Grade II* and Grade 11 buildings whose settings will be impacted. To give an idea of the impact of this, in CFA 8, 9 and 10 alone there are there are 550 buildings alone, identified by HS2 Ltd.
There is also a severe impact on archaeological sites along the line with approximately 20 in CFA 9 and 10 alone. These include Roman villas, Romano British remains and ancient field patterns
There will certainly be many more such assets impacted along the line. This is further evidence that the ES is incomplete.

8 – Ecology

This section covers the impacts on
Scientific sites, habitat, species etc. The numbers have been summarised to give an idea of the impact overall.
Sites of Special Scientific Interest (of National Value for Conservation)
two sites directly impacted
Several other sites recorded. The author of the report expects no further impact. However Bacombe Hill SSSI, will be within 25m of a major construction site for four years. It is highly likely that this site will be impacted. This raises doubts about other sites, such as the Weston Turville Reservoir SSSI, which may be impacted by changes in water flow.

Non statutory Local Wildlife Sites (LWS)
89 LWSs will be impacted through habitat loss / fragmentation. 61 sites will have their integrity threatened

Habitats to be lost

32 ha of ancient woodland
310 ha of broad-leaved woodland
170 ha of neutral grassland
19 Ha of fen, marsh, swamp
490 km of hedgerows

The above contain 330 ha habitats of principal importance. The overall loss of habitat and hedgerows represents a significant risk of loss of wildlife. The report seeks to classify this as minor in relation to the UK, however in regard to the Proposed Route, this is a severe adverse impact, particularly as the loss together with the physical barrier of the built infrastructure

will decimate animal migration paths. Proposed mitigation of additional planting will take years to mature, but will not restore many migration paths.

In addition to the above habitats identified by HS2 Ltd, there are other habitats, further from the line, which could well be impacted by the Proposed Scheme. An example is the River Misbourne, which will be tunneled under twice. Such tunneling may affect the flow of the water through the aquifer, causing the river to dry up. Chalk stream habitats are globally rare, and thus a very sensitive receptor. Water voles are recorded in locations down the river, particularly at Gerrards Cross Golf Course. Their existence would be threatened if the river disappeared.
There is anecdotal evidence that water voles and white-clawed crayfish are present on the upper reaches of the river.

Species - Bats

13 species out of 17 English species are found on the Proposed Route including three colonies of Bechstein's Bat and six colonies of Barbastelle Bats. Both of these are rare breeds. There are a large number of bat assemblages along the route.
The HS2 Ltd assessment in 8.1.34 is that key impacts on bats will be those associated with the loss and disturbance of roost sites and the severance of existing habitat. The loss of hedgerows and other habitats that provide connectivity in the landscape, will affect the ability of some bat species to move between roost sites and foraging areas. The impact of such a disturbance or displacement would be greatly increased if bats are hampered in moving between breeding sites, hibernation sites and other roosts which they commonly utilise. See Habitats above for the loss of habitat in particular hedgerows.
In addition 8.1.35 states 'There is also a risk of bat mortality due to collision with passing trains and associated turbulence from trains. However, when travelling at high speed, trains will pass quickly (approximately four seconds), and therefore exposure to the risk of collision will be intermittent and not continual'. The assumption here is that the train is 400m long, whereas many of the trains will be 800m long. Considering that 18 trains per hour each way are proposed on this railway, there is a high risk of losing a substantial proportion of the bat species.
8.1.37 talks glibly about compensation measures taking 50 years to mature. Natural England's guidelines indicate that the compensation measures for bats should be in place before development begins. There is also a suggestion in 8.1.38 that compensation measures would be within the Proposed Scheme. This would not be compensatory as the bats would still be at risk from the trains.
There are many fine words about providing green bridges, and fly over paths for bats however none of these appear in the design of the route through Chilterns AONB.

Great Crested Newts

HS2 Ltd has identified that great crested newts exist along most of the line outside urban areas. The Proposed Route will impact breeding ponds and terrestrial supporting habitat, which will be lost. Compensatory measures include providing new ponds and habitat preferably on the Proposed Route. 8.1.48 states that they consider it unlikely that a significant effect will occur. Please note the word 'unlikely'. Again there are no guarantees that the mitigation will work.

Otters

Otters have been identified along the Proposed Route. The intention is to provide a safe passage for otters wherever the Scheme crosses a watercourse. This time it is likely that no significant adverse effects are likely to occur. Please note the word 'likely'. Again there are no guarantees that the mitigation will work.

Hazel Dormouse

Not identified as yet on the Proposed Route. However as the EIA has only been carried out over 1 year instead of the normal 3 years and HS2 Ltd failed to access a substantial amount of the land along the Route, this conclusion cannot be relied upon.

Birds

8.1.56 assesses that 'for the majority of birds, impacts arising from construction of the Proposed Scheme are not likely to result in permanent adverse effects on breeding and wintering populations. This is because the habitats supporting these species will be recreated once construction is complete'.
It is clear from this that an adverse impact is expected on birds from the construction of the Scheme. Again note the use of the word 'likely'. This means they might recover after the scheme is built, but there is no certainty.

Barn owls in particular are at risk, both from the loss of habitat and nesting sites, during the construction period, and during operation from owls being killed by passing trains. The assessment is that there may be a loss of 52 pairs of barn owls, representing 1% of the UK population. This is already a threatened species, and is considered a significant adverse impact at national level, even by HS2 Ltd.

Common Reptiles

8.1.60 identifies that adders, grass snakes, lizards and slow worms have been found within land required for construction, which will have an adverse impact..
It is expected that mitigation will reduce this adverse impact. Again the use of a qualifying word 'expected'. The level of impact is impossible to assess as the EIA was conducted over a period of a year rather than 3 years, and HS2 failed to access a high proportion on the land along the Proposed Route.

Badger

8.1.62 states that numerous badger setts were found within the land required for construction. The assessment is that adverse impacts will occur on the badger population, however as there are lots of them, the impact will not be significant.

White-clawed Crayfish

Only one population found, therefore anticipated that no adverse impacts will occur. Again as the EIA was carried out over one year instead of three years and HS2 failed to access a large amount of the land along the Proposed Route, the conclusion must be suspect.

Seeking no net loss

8.1.75 states that the UK Government is committed to halting overall loss in biodiversity by 2020. There are lots of fine words about measuring the impact before and after construction, with a weighted scoring method.
Unfortunately, after the Proposed Scheme is built, should the losses be significantly worse than anticipated, there will be little that HS2 can do to rectify the position.
It would be much more satisfactory if a proper EIA had been conducted over a three year period, covering all the land required by and impacted by the Proposed Scheme. This would give a proper baseline to design and introduce ecological mitigation measures, and to evaluate them before construction begins.

The overall conclusion to be drawn from the Ecology section is that the preparation of the Environmental Statement has been rushed, and consequently has not been done in sufficient detail to provide a sound assessment.
This is evidenced by

- Only using 1 year to establish a baseline, where 3 years is normal
- Failure to access substantial amounts of land for surveys
- Failure to look beyond the boundaries of the Scheme to establish the impacts further afield
- The use of qualifying words, such as likely, unlikely, expected, considered. All of which indicate that there is insufficient data to come to a firm conclusion.

11 - Socio-economics

This section sets out to demonstrate that the employment created by building the line should be included as a benefit. This has already been taken into account in the Benefit Cost Ratio Economic Assessment. As has the Wider-Economic Benefits of development at station sites.
What has not been taken into account is the impact caused

- on businesses not directly on the line
- by introducing more work into areas of high employment
- Delays to people commuting due to construction traffic, and road closures
- Delays to commuters on existing lines disrupted by construction
- On new business formation
- The impact of workmen, living on sites, on the local communities
- On the health of people affected by the construction of the Scheme

We are not in a position to calculate these impacts. However they should be included and again demonstrate the inadequacy of the ES.

Businesses not directly on the line

There are a substantial number of businesses impacted. Prime examples are estate agents and solicitors, who have seen the number of houses sold decline substantially, as well as the fall in the house prices. This has already happened along the route with property blight. This can be expected to continue until the Scheme is completed.
Shoppers will change their shopping habits. As an example economic activity in Wendover has already declined.

Introducing more work into areas of high employment

The construction of the Scheme will introduce opportunities for local construction workers. This will reduce the supply of construction labour. There will inevitably be an increase in the cost of non-HS2 related construction.

Delays to people commuting due to construction traffic, and road closures

During the construction period there will be substantial delays for commuters by road, both in accessing public transport and driving directly to work caused by increased congestion and in some cases by diversions due to road closures.

Delays to commuters on existing lines disrupted by construction

The major works at Euston in particular will inevitably delay trains on the existing rail network. There will be further impacts at Birmingham and when HS2 is connected to the WCML. As these will adversely affect thousands of people per day for a number of years, the adverse economic impact will be significant.

New business formation

The disruption caused by the construction will inevitably reduce the number of new businesses in the areas impacted by the Proposed Scheme, thus reducing local job opportunities and other beneficial impacts

The impact of workmen, living on sites, on the local communities

There are a number of major sites that provide worker accommodation. The impact of introducing a substantial number of single men into the local community will certainly be significant in small towns. Wendover is an example where between 175 and 245 men will be resident. While they will provide additional business for some pubs, there will be substantial reduction in local people using the restaurants and pubs in the evening. Problems in Kent have been reported when HS1 was built, resulting in the closure of at least one pub.

Health

The process of learning about the HS2 proposals has been very stressful for local people within a relatively wide band surrounding the proposals. This already is having an effect. The additional pressures created by the construction, traffic, noise, transport disruption will impact people's health further. An assessment of this impact needs to be included in the ES.

13 - Traffic and transport

13.2.1 sets out the proposition that continued growth is forecast for long distance train travel, and that the Proposed Scheme will bring benefits to commuters, business and leisure passengers.

There has been in recent years a substantial growth in long distance train passengers, mainly due to the upgrade of WCML. However the statistics from 1947 to the present show that the long term growth has been in line with the growth in population and averages approximately 1% per year. Recent statistics indicate that growth has ceased in the last year.

The next question is whether HS2 is needed to meet this demand. 51m's Optimised Alternative delivers the same capacity as HS2, through a combination of de-bottlenecking the

existing intercity lines, separating freight and passenger services, longer trains and changing a number of first class carriages to standard class. This could be delivered at a cost of approximately £2bn. The impact can already be seen with the introduction of 11 carriage trains on the WCML, which has reduced capacity utilisation to less than 50%.

The claim to benefit commuters by increasing capacity on the exiting rail network needs to be examined. The Economic Case for HS2 is predicated on a substantial saving in the operating costs of the existing railway. To claim a benefit for commuters is in fact double counting the benefit.

Reduced journey times will certainly be a benefit to those who live near one of the planned four stations. The benefits are quickly eroded by having to access these stations from cities, which already have a direct service to London. The HS2 plan involves reducing or eliminating these services, thus actually reducing the interconnectivity of cities and towns across the country.

13.3.2 States that the collective impacts associated with the movement of excavated material and fill at the route-wide level has been scoped out of further consideration. The impact of dumping thousands of M3 of spoil on an AONB needs to be examined, in the event that approval of this disposal method is not approved.

The impacts of construction traffic are focused on the road network close to the Proposed Scheme, There needs to be a complete study of the impact of construction traffic on all roads which it will use. This should extend a considerable distance from the Proposed Route. One example is Beaconsfield which has a junction on the M40 that connects to the A355. The latter road has been identified as a major route for access to work sites in the Misbourne Valley, with up to 840 two way journeys per day. The current connection is already heavily congested during the commuter peak period from 06.45 to 09.15. There is a similar impact on the A413. It is almost certain that there will be further examples all the way to Birmingham. This is another example of the inadequacy of the ES.

13.3.7 Sets out the scale of disruption to the existing rail network. The negative socio-economic impact of this has not included the Economic Case, thus presenting an over-optimistic financial picture of the Proposed Scheme.
While there is an optimistic assessment of how these works will be carried out, creating little disruption, the reality is set out in 13.3 13.

Overall the Socio-Economic analysis has concentrated on the benefits arising from the Scheme, but failed to look at the impacts on local communities. This together with the major dis-benefits excluded from The Economic Assessment demonstrates that HS2 will deliver even less value that currently estimated.

13.4 Effects arising during operation

The paragraphs describe the operation of HS2 from 2026 to 2036. What is apparent that these figures are compared with existing train times and operations, whereas the rational approach would be to compare them against a scheme for the existing railway with improvements, such as 51m's Optimised Alternative. This provides a similar increase in capacity to HS2, but at a significantly lower cost estimated at £2bn.

This will deliver

- Increased passenger capacity on the WCML
- Increased freight capacity on the WCML
- Doubling of long distance commuter capacity from Milton Keynes and Northampton into Euston
- Major increase in short term commuter capacity from Watford and Hemel Hempstead

Investment in other lines such as the ECML and the Midland Mainline will also enable time reductions to northern cities. Some additional investment in the WCML, enabling existing intercity trains to operate at their design speed of 140mph will reduce travel times further
The arguments set out in 51m's 'Optimised Alternative' and their 'Better than HS2' papers are to be taken as part of our response to this consultation.

The Proposed Scheme does not address the severe crowding on other lines into London such as services into Paddington and Waterloo, which are the most crowded currently. The substantially lower investment required by the 'Optimised Alternative' would enable funds to be made available for improvements to these services and commuter services into other cities such as Leeds and Manchester.
It is important to note that 'Optimised Alternative' delivers the benefits significantly earlier that 2026, as proposed by HS2.

The overall calculation of demand depends on an assumption about future growth. Long distance passenger growth has slowed substantially, and recent figures from the DfT indicate that it has plateaued. This is hardly surprising with the growth in digital media, the ability to tele-conference and the tight controls being applied by many businesses to travel. The other question that is raised by the comment in 13.4.30 that '20% of HS2 trips will be generated as new travel', is whether this is good for the economy.

14 Waste and material resources

The ES sets out the huge amount of spoil (excavated material) being generated by the construction of the Proposed Scheme. It proposes to reuse a substantial amount with landscaping within the Route, and the balance to be dumped on farmland. The majority of this is proposed to be in the Chilterns AONB at Hunt's Green Farm, where according to Vol. 2 CFA 10, a spoil pile 1,300m x 450m x 5m will be created.
It has subsequently come to light that there is an intention to move spoil from other areas such as Quainton to the Chilterns. Not included in Vol. 3 Route-wide Effects
A recent visit to the farm by HS2 Ltd indicated that the spoil pile will be over 9m high.
A change of this nature is unacceptable in an AONB. The spoil produced by tunneling through the Chilterns to the north of Wendover would be a third of that generated by the proposed scheme, and would leave the AONB landscape virtually untouched. This would also be in line with the Waste Management Strategy of Prevention first.

15 - Water resources and flood risk assessment

Surface Water Resources

This section fails to address the risk of impacts to the River Misbourne, which runs through CFA 7, 8 and 9, and the risk of the loss of the river through tunneling activity at Chalfont St Giles and north of Amersham, where the Proposed Scheme crosses under the river. The risk

relates particularly to diverting the groundwater to follow a different route. As set in the section on Ecology, the habitat of the Misbourne is that of a globally rare chalk stream.

Groundwater Resources

15.4.7 Identifies that within the Mid-Chilterns Chalk groundwater body, which spans several CFA, the Proposed Scheme could give rise to a significant temporary adverse effect on water supplies, including public water supplies, which depend on the groundwater in the Chalk in CFAs 6, 7, 8 and 9. .It further states that a Management Plan will be agreed with the Environment Agency and Affinity Water Limited. However this is based on monitor, wait and see.

We believe that the ES should contain a proper risk analysis with actions identified for each of the risks.

15.4.9 Sets out that there is a likely significant adverse effect, albeit believed to be temporary.

15.5.20 For Mid-Chilterns Chalk, a significant residual risk to the drinking water protected area element has been identified owing to the proximity of the Proposed Scheme to existing public water supply abstractions. There is also a risk of Water Framework Directive deterioration with respect to the drinking water protected area WFD element for chemical status of the Mid-Chilterns Chalk groundwater body.

What has been ignored is that these risks are in the Colne catchment area, which supplies 22% of London's public water supplies. Any temporary interruption to this would be a major disaster.

15.5.28 concludes that there is an over-riding public interest in building the Proposed Scheme, and as such alterations to surface and ground water will not breach the WFD.

The over-riding public interest of the Proposed Scheme has not been proven, as while an increase in rail capacity to the North appears to be desirable, this could be provided by either a different route or 51m's Optimised Alternative.

Flood Risk

15.6.2 argues that the Sequential Flood Risk Assessment set out in the NPPF has been met as this was looked at in the AoS, which considered several route options. The question arises whether the Sequential Test was applied to all alternative routes or only those which were left are eliminating routes based on small time savings. The AoS also ignored the generally accepted principle that new transport infrastructure should follow existing major transport routes.

The Government recently confirmed that no Flood Assessment has been carried out for HS2.

Volume 4 - Off-route effects

This section of the ES report is limited to the off-route impacts to the rail infrastructure relating to construction of the Proposed Scheme.

The impacts covered in the Community Forum Area Reports are limited to an area up to 1km from the proposed route. Thus the report has failed to examine the impact of building HS2 on those communities that will be effected but that are outside the 1km limit. These fall under the following headings

- The integrated nature of many of the communities along the line
- The impact of loss of trade
- The impact on business creation
- The impact on education
- The cumulative impact of construction traffic on certain communities
- The impact on access to Accident & Emergency Services

These will have between moderate and severe impacts. The examples given below relate to communities in the Chilterns and covered by CFAs 8, 9, 10.

The integrated nature of many of the communities along the line

The assessment in CFA 8 deals with Old Amersham, but fails to deal with Amersham on the Hill, which is a substantially larger community, and has a station for both the Chiltern Line and London Underground. It is also a large shopping Centre. No account has been taken of the impact of construction on delays to commuters or the loss of trade in the shops. People access Amersham from across South Bucks.
The impacts on Great Missenden, Little Missenden, Hyde Heath and South Heath are set out in CFA 9, and critiqued there. However the impacts on Prestwood (double the population of Gt Missenden), Little Kingshill (approximately 1,000) are completely ignored. These together with the hilltop villages of The Lee and Ballinger form one community. The doctors, dentists, solicitors, estate agents and shops based in Prestwood and Gt Missenden provide services to residents of the whole community.

The impact of loss of trade

Solicitors and Estate Agents have already seen an impact on their income from the blight on property causing a drop in property sales and prices.
Businesses in Prestwood such as Peterley Manor Farm (pick your own and shop) and Hildreths (garden centre, hardware and china) draw customers from as far away as Chesham. Interruption to access and delays will substantially reduce their customer base during the construction period. There will be a similar impact on car repair businesses based in Prestwood and Gt Missenden.

The impact on business creation

Chiltern District Council and Aylesbury Vale District Council have one of the highest rates of business formation in the country. With the degree of disruption created by the building of HS2, people looking to start up a business are likely to look for a location which is not impacted by HS2. Over the course of construction, this will have a significant impact on the level of employment available in the area.

The impact on education

No assessment has been made of the impact on education of the disruption caused by building HS2. It is clear from the Transportation analysis carried out that HS2 Ltd failed to recognise the effect this will have on children travelling to and from school. Buckinghamshire still has grammar schools. As a result a large number of children travel quite substantial distances to school. As an example, children in Prestwood go to schools in Chesham, Amersham, Aylesbury and High Wycombe, as well as Great Missenden. Most of the busses are on the road from well before 8.00 am going to pick up children until 9.00 am when the children are delivered to school. There is a similar pattern in the afternoon, with infant school traffic starting at 3.00 pm and buses returning to depots towards 5.00 pm.
There are two schools (Prestwood Lodge and Wendover House) for children with emotional and behavioural difficulties. These children come from across the county and are delivered to, and collected from, school by taxi. Delays caused by construction and the associated roadworks and road closures will result in either the children having to leave home much earlier or being late for school.

The cumulative impact of construction traffic on certain communities

No assessment has been made of the cumulative impact of construction traffic on communities away from the line. Good examples are Amersham and Beaconsfield. The majority of construction traffic for sites in the Upper Misbourne Valley is forecast to access those sites via A355 and A413. The estimates add up to approximately 840 vehicles each way, mainly during the rush hour. These roads are already busy, with traffic backed up on the roundabouts on the Amersham By-pass (A413) and on the A355 approaching Beaconsfield from both Amersham and the M40. These will add significant delays to the already congested roads.
Another example is the proposed use of the A4010 from the M40 Handy Cross Junction to Aylesbury. Clearly no one has looked at the A4010, which is a two lane road traversing a populous part of High Wycombe through a series of small roundabouts. It then joins the A40, which is another two lane road that is heavily used

The impact on access to Accident & Emergency Services

There is a reported impact on access to Accident and Emergency Services. There are several large communities in Chiltern District Council (93,000 residents) among them Amersham, Chesham, the Chalfonts, the Missendens and Prestwood who rely on the A413 for access to the A&E centre at Stoke Mandeville Hospital.
Wycombe District Council (172,000) has a similar issue, with the population using the A4010 to access the A& E centre at Stoke Mandeville Hospital. Both these routes are designated access routes to the work sites in the Upper Misbourne Valley, Wendover and Stoke Mandeville.

These examples and others like them will be repeated along the line all the way to Birmingham.
The conclusion drawn from the above is that Environmental Impact Survey has not been completed adequately for off-route effects

The majority of the issues relating to CFA 8, 9, 10 would be avoided by a fully bored tunnel from the M25 to north of Wendover. However other alternative mitigation would be needed along the rest of the route.

2.3 Issues scoped out of the off-route assessment

Consequential Impacts on Network Rail
2.3.2 states that other consequential works will be needed on Network Rail infrastructure.
2.3.7 states that construction and operational effects from consequential works to Network Rail infrastructure have been scoped out of the off-route assessment.
While it would not be necessary to seek approval of the works in the Hybrid Bill, the costs of such works should be included in the overall project cost, and as they are consequential any environmental impact should be identified and paid for by the HS2 project.

The rest of the report relates to specific changes to railway operations outside of the Chilterns, which we will not comment on.

Draft Code of Construction Practice

The draft Code of Construction Practice is seriously flawed for a number of reasons which are set out below. It also does not distinguish between the standards to be applied generally and those to be applied when operating within the Chilterns AONB.
It repeatedly use phrases such as 'as far as reasonably practicable' in a manner that leaves all contactors an excessively large degree of discretion, especially on operations conducted within the Chilterns AONB;
There is a suspicion that the Code of Construction Practice has been drawn up in a manner that seeks to reduce costs at the expense of the environment, especially as far as the Chilterns AONB is concerned.

5.1 Community relations

5.1.1 states that: *The nominated undertaker and its contractors will produce and implement a stakeholder engagement framework and provide appropriately experienced community relations personnel to implement the framework, to provide appropriate information and to be the first point of contact to resolve community issues. The nominated undertaker* ***will take reasonable steps to engage with the community****, particularly focussing on those who may be affected by construction impacts including local residents, businesses, land owners and community resources, and the specific needs of protected groups (as defined in the Equalities Act 2010).*

5.1.2 states that: *Regular meetings will be held at Community Forum locations between the lead contractor, the nominated undertaker, local authority and representatives of the local community or other stakeholders to discuss construction issues and the forthcoming programme of works. Experienced support for local businesses, land owners, voluntary and community organisations that may be affected by the works will be provided by the nominated undertaker.*

These statements provide no detail about the frequency of meetings or when they would take place. Yet again the *nominated Undertaker* is only required to take ***reasonable steps to*** engage with the community. Who will decide just what steps are reasonable. The local communities that will be so badly affected by the Proposed Scheme will need reassurance that their concerns will be addressed.

5.2 Working hours

5.2.1 states that: *The nominated undertaker's contractors* ***will seek to obtain consents*** *from the relevant local authority under Section 61 of the Control of Pollution Act 1974 for the proposed construction works, excluding non-intrusive surveys (see Section 13).*
Presumably from this statement, it is only necessary for the nominated undertaker to **seek consent** in order to conform to the CoCP. This is not good enough.

Core working hours

5.2.2 states that: *Core working hours will be from 08:00 to 18:00 on weekdays (excluding bank holidays) and from 08:00 to 13:00 on Saturdays. The nominated undertaker will require that its contractors adhere to these core working hours for each site* ***as far as is reasonably practicable*** *or unless otherwise permitted under Section 61 of the Control of Pollution Act 1974.*
Again *as far as is reasonably practicable* implies a level of self regulation and is not good enough.

Start up and close down periods

5.2.5 states that: *To maximise productivity within the core hours, the nominated undertaker's contractors will require a period of up to one hour before and up to one hour after normal working hours for start-up and close down of activities.* ***This will include but not be limited to deliveries, movement to place of work, unloading, maintenance and general preparation works. This will not include operation of plant or machinery likely to cause a disturbance to local residents or businesses.*** *These periods will not be considered an extension of core working hours.*
The two parts of the statement highlighted could well disagree with each other. The movement of HGVs outside of the core working hours could well cause disturbance to local residents and businesses.

Additional working hours

5.2.6 states that: *Tunnelling1 and directly associated activities (such as removal of excavated material, supply of materials and maintenance of tunnelling equipment) will be carried out on a 24 hour day, 7 day week basis.* ***Where reasonably practicable****, material will be stockpiled within the site boundary for removal during normal working hours.*
Again *as far as is reasonably practicable* implies a level of self-regulation and is not good enough.

5.2.7 states that: *Work within existing stations, track laying activities and work requiring possession of major transport infrastructure may be undertaken during night time, Saturday afternoon, Sunday and/or bank holiday working for reasons of safety or operational necessity and will often involve consecutive nights work over weekend possessions, and may on occasion involve longer durations. Activities outside core working hours that could give rise to disturbance will be kept to a* ***reasonably practicable*** *minimum.*
Again *as far as is reasonably practicable* implies a level of self-regulation and is not good enough.

5.2.11 states that: *In the case of work required in response to an emergency or which if not completed would be unsafe or harmful to the works, staff, public or local environment, the relevant local authority will be informed as soon as* ***reasonably practicable*** *of the reasons for, and likely duration of, the works. This information will also be made available to the HS2 helpline.*
Again *as far as is reasonably practicable* implies a level of self-regulation and is not good enough.

5.3 Construction site layout and good housekeeping

5.3.1 states that: *To reduce the likelihood of either an environmental incident or nuisance occurring the following measures will be used, where relevant:*

- *where* ***reasonably practicable****, maintenance of public rights of way (PRoW) (including diversions) for pedestrians, cyclists and equestrians affected by the Proposed Scheme, including* ***reasonable*** *adjustments to maintain or achieve inclusive access;*

Again *as far as is reasonably practicable* and *reasonable* implies a level of self-regulation and is not good enough.

5.6.5 states that: *Clear sight lines will be maintained around hoardings and fencing with no hidden corners in order to avoid, where* ***reasonably practicable****, opportunities for anti-social behaviour and crime and to ensure safety of vehicles.*
Again *as far as is reasonably practicable* implies a level of self-regulation and is not good enough.

5.6.7 states that: *Fencing and hoarding will, as far as is **reasonably practicable**, be located such that it does not damage sensitive habitats, trees or hedgerows.*
Again *as far as is reasonably practicable* implies a level of self-regulation and is not good enough.

5.15 Interface management between adjacent construction areas

5.15.1 states that: *The nominated undertaker will oversee the interface between the contractors and will require its contractors put in place measures to manage the environmental aspects of interfaces between adjacent construction areas, including the boundaries between areas under the control of different contractors or where **reasonably practicable** other third party contractors.*
Again *as far as is reasonably practicable* implies a level of self-regulation and is not good enough.

6 Agriculture, forestry and soils

There are concerns about the repeated use of the phrase *reasonably practicable* as set out below. Exactly what does the phrase mean and who will decide on its relevance. The phrase would seem to allow self regulation.

6.2.6 states that: ***Reasonable precautions** will be taken during the design and construction of the Proposed Scheme to identify, protect and maintain existing land drainage, irrigation and livestock water supply systems.*

6.2.8 states that: *The nominated undertaker will require its contractors to comply with the relevant guidance issued by Defra regarding the prevention, **as far as reasonably practicable**, of the spread of soil-borne, crop and animal diseases.*

6.2.9 states that: *Wherever **reasonably practicable**, the nominated undertaker will endeavour to identify recorded locations of carcass burial sites within the construction site and to mitigate risks associated with the existence of any unrecorded sites.*

7 Air quality

There are concerns about the repeated use of the phrase *reasonably practicable* as set out below. Exactly what does the phrase mean and who will decide on its relevance? The phrase would seem to allow self regulation.

7.2.1 states that: *The site layout will be planned to locate machinery and dust-causing activities away from sensitive receptors, **where reasonably practicable.***

7.2.2 states that: *Measures will be implemented to limit emissions from construction plant and vehicles, which will include the following, as appropriate:*

- *non-road mobile machinery will use ultra-low sulphur diesel, **where reasonably practicable;***

7.2.3 states that: *Dust and air quality management measures will be implemented to limit pollution arising from the transportation and storage of materials, including the following, as appropriate:*

- *the number of handling operations for materials will be kept to the minimum **reasonably practicable.***

7.2.4 states that: *Haul routes will be provided through the works for use by construction vehicles to access the works. The construction and maintenance of haul routes, will include the following measures, as appropriate:*

- *the surfacing and maintenance of haul routes to control dust emissions **as far as reasonably practicable,** taking into account the contractors intended level of traffic movements.*

7.2.5 states that: *Dust pollution from demolition activities will be limited through the use of the following measures, as appropriate:*

- *blasting works will be kept to the **minimum reasonably practicable** in the context of the design and programme requirements of the project.*

7.2.6 states that: *Dust pollution from excavations and earthworks activities will be limited through the use of the following measures, as appropriate:*

- *topsoil will be stripped as close as **reasonably practicable** to the period of excavation or other earthworks activities to avoid risks associated with run-off or dust generation;*
- *drop heights from excavators to vehicles involved in the transport of excavated material will be kept to the **reasonably practicable minimum**; and*
- *soil spreading, seeding, planting or sealing of completed earthworks will be undertaken as soon as **reasonably practicable** following completion of the earthworks.*

7.2.7 states that: *Dust pollution associated with grouting activities will be limited through the use of the following measures, as appropriate:*

- *the mixing of grout or cement based materials will be undertaken using a process suitable for the prevention, **as far as reasonably practicable**, of dust emissions.*

7.2.8 states that: *Dust pollution associated with processing and crushing rock, for use as aggregate or other materials within the works, and for conveying material, processing, crushing, cutting and grinding and liming will be limited through the use of the following measures, as appropriate:*

- *drop heights from conveyors, excavators, and crushing plant to stockpiles will be kept to the **minimum reasonably practicable.***

8 Cultural heritage

There are concerns about the repeated use of the phrase *reasonably practicable* as set out below. Exactly what does the phrase mean and who will decide on its relevance? The phrase would seem to allow self regulation.

8.1.4 states that: *Suitable route-wide measures and procedures, to be developed in consultation with EH and the local authorities, will include the following, as appropriate:*

- *implementation of controls at each site to avoid damage by settlement where **reasonably practicable** (and to record effects should these occur) to structures of historic importance or interest and the movement of construction vehicles and machinery as they relate to areas of heritage interest that may comprise standing archaeological remains and historic buildings;*

9 Ecology

There are concerns about the repeated use of the phrase *reasonably practicable* as set out below. Exactly what does the phrase mean and who will decide on its relevance? The phrase would seem to allow self regulation.

9.1.3 states that: *Where **reasonably practicable**, environmental mitigation will be provided via the design and implemented by the contractors within the works. This may require preparatory work to be undertaken ahead of the start of construction to permit timely progress of the programme.*

9.1.5 states that: *The contractors will, **where it is reasonably practicable** reduce any habitat loss within the land required for the Proposed Scheme by keeping the working area to the minimum required for construction of the Proposed Scheme.*

10 Ground settlement

10.1.1 states that: *Excavation for the Proposed Scheme tunnels, shafts cross passages, station boxes and other below ground structures will **potentially lead to small ground movements at the surface and below ground.** Very rarely these ground movements may affect properties/third party assets. **Techniques for controlling settlement of buildings and protecting buildings from irreparable damage are well developed, based on other tunnelling projects within London such as the Jubilee line extension, CTRL and Crossrail.** Appropriate techniques will be implemented in order to control and limit, as far as **reasonably practicable,** the effects of settlement.*
It is admitted that there could be small ground movements, the concern however, is that these could lead to very significant effects. It is stated that techniques for controlling settlement that are based on other tunnelling projects in London would be implemented but the schemes quoted were through clay. This project would tunnel through chalk and other unknown materials. Once again there is great concern that these techniques would, in any case, only be used when **reasonably practicable.**

12 Landscape and visual

12.2.6 states that: *Trees intended to be retained which may be accidentally felled or die as a consequence of construction works will be replaced. Where **reasonably practicable,** the size and species of replacement trees will be selected to achieve a close resemblance of the original trees most effectively using locally occurring native species of local provenance and taking cognisance of any management plans for immediately adjacent areas of woodland.*

12.3.1 state that: *Planting and other landscape measures will be implemented as early as is **reasonably practicable** where there is no conflict with construction activities or other requirements of the Proposed Scheme.*

13 Noise and vibration

Here again there are concerns about the repeated use of the phrase *reasonably practicable. Best Practicable Means* is another phrase that now crops up. From the definition below it would seem to be another name for self regulation.

13.1 Noise and vibration management - general provision Best Practicable Means

13.2.1 ***BPM** are defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environmental Protection Act 1990 as those measures which are '**reasonably practicable** having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.*

13.2.4 states that: *The effects of noise and vibration from construction sites will be controlled by introducing management and monitoring processes to ensure that **BPM** are planned and employed to*

minimise noise and vibration during construction. As part of the lead contractors' EMS, a noise and vibration management plan will be prepared and will set out these processes. The plan will include management and monitoring processes to ensure as a minimum:

- *developing procedures for the installation of noise insulation or provision of temporary re-housing and to ensure such measures are, where required, in place as early as **reasonably practicable.***

The use of both phrases in one statement just adds to the doubt about its effectiveness.

13.2.10 states that: *The nominated undertaker will implement a noise insulation and temporary rehousing policy. The policy is intended to provide additional protection to residents in the event that it is **not practicable** to mitigate airborne noise, or reduce its exposure, to levels that are tolerable during certain intensive construction phases.*
Reasonably practicable is reduced to just *practicable.*
What is the significance of this?

The following statements contain such vague terminology that it is impossible to draw any conclusions. This is of great concern to those who will suffer the consequences.

13.2.14 states that: *The nominated undertaker will develop and **seek to agree** with local authorities a noise insulation and temporary re-housing policy that will set out all roles, responsibilities and actions required in respect of these measures.*

13.2.15 states that: *The **nominated undertaker will consider at its discretion** applications supported by evidence for noise insulation or temporary rehousing from occupiers who may have special circumstances, such as night workers, those working in home occupations , local businesses or buildings that provide community facilities requiring a particularly quiet environment and those with a medical condition which will be seriously aggravated by construction noise, and provide noise insulation or temporary housing where it is demonstrated that this is necessary.*

13.2.21 sates that: *For application of threshold levels, **it will be assumed** that people are standing or sitting during daytime, and lying down during night-time hours as defined in the table. The orientation of the person is important as it determines the vibration weighting factor to be applied.*

13.2.26 states that: *The nominated undertaker will require its contractors to notify and consult it and the relevant local authority regarding any works predicted to generate a PPV above 10mm/s. Where it is agreed that there is **no reasonable or practicable means** to reduce predicted or measured vibration then the contractors will:*

- ***agree with the nominated undertaker** and **seek to agree with the local authority** under the relevant Section 61 consent5, monitoring for vibration and strain induced in the building during the works;*
- ***seek to agree** with occupiers of properties:*
  *The surveys to be carried out and any consequent actions; any additional **reasonable and practicable** mitigation to be provided for occupants;*

What is the difference between *agree* and *seek to agree* and between *reasonably practicable* and *reasonable **and** practicable?* The use of variations of similar phrases is very worrying.

14 Traffic and transport

14.1.1 states that: *During its construction works, the nominated undertaker will require that the impacts on the local community from construction traffic are minimised by its contractors and that public access is maintained where **reasonably practicable.** The impact of road based construction*

traffic will be reduced by identifying clear controls on vehicle types, hours of site operation, and routes for large goods vehicles.
It is not acceptable that impacts on the community are only minimised where *reasonably practicable*. Who will decide when something is *reasonably practicable?* This is a vital part of the CoCP and communities have a right to know that their interests and safety are worth protecting under any circumstances.

14.1.2 states that: *Construction workforce travel plans will be prepared by the lead contractors with the aim of* ***encouraging*** *the use of sustainable modes of transport to reduce the impact of workforce travel on local residents and businesses.*
Yet another vague term is applied. HS2 will need to do more than *encourage* the use of sustainable modes of transport.

14.2.1 states that: *Generic and site specific traffic management measures will be implemented during the construction of the project on or adjacent to public roads, bridleways, footpaths and other PRoW affected by the proposed scheme as necessary.*
Terminology used renders this statement meaningless to the lay person.

14.2.2 contains a list of Generic measures will be discussed with the appropriate authorities. It goes on to say that this list '***may include'*** followed by a list of measures.
The use of the *term may* include could equally be followed by the assumption that on the other it *may not*. We need to know what **will** be included.

14.2.5 states that: Site specific traffic management measures will include the following, as appropriate including *the introduction of a GPS vehicle location and tracking system for tipper lorries* within the lead contractors' control to be used for the movement of materials and waste in bulk.
GPS systems must be fitted to all HGVs.

15 Waste and materials

15.2.5 states that: *Suitable projects or other opportunities for reuse of excavated material* ***may be identified*** *as the detailed construction planning of the Proposed Scheme progresses.*
The use of the term *may be identified* means that this potential impact on traffic levels on associated roads cannot be known.
Safeguards will need to be put in place.

16 Water resources and flood risk

Private water supplies

16.2.15 states that: *Any water supply pipes damaged during construction will be repaired or replaced as quickly as* ***reasonably practicable*** *and normally within 24 hours.* ***However, the repair of any such damage caused by utility companies working on behalf of the nominated undertaker will be the responsibility of that utility company.***
The use of the phrase *reasonably practicable* and *normally* are not good enough when used in association with the public water supply. Passing the responsibility for repair on to a utility company is not acceptable.

Measures to reduce potential flood risk impacts

16.3.4 states that: *The contractors will, as far as **reasonably practicable,** ensure that flood risk is managed safely throughout the construction and implementation period and consider flooding when planning sites and storing materials* and that ***Where practicable**, contractors should avoid locating temporary structures, such as accommodation and stockpiles, and the placing of construction equipment within Flood Zone 3 areas or areas at significant risk of flooding from other sources.*
The use of the terms *reasonably practicable* and *practicable* in connection with the same measure are confusing and unacceptable. What is the difference between *reasonably practicable* and *practicable*.

Monitoring

16.4.3 states that: *The nominated undertaker will require its contractors to carry out appropriate monitoring to identify pollution risks that are **unacceptably high**.*
Who will decide whether or not the level of pollution level is acceptable?

16.4.4 states: that *Appropriate actions will be taken where pollution risks are **unacceptably high**, where there is noncompliance with the CoCP, where spillages and leakages are unacceptable or where there are any suspected pollution incidents.*
See above.

Our response to Volume 5 is limited to comments on Transport Assessment, Waste & Material Resources, and Water Resources

Volume 5 Technical Appendices

Transport Assessment - TR-001-000

Part 1: Introduction

Country local transport policy

Buckinghamshire

2.5.8 states that: *Buckinghamshire's anticipated high levels of house building and economic growth over the forthcoming years could have a significant adverse impact on the county's transport network. This increase in pressure would be felt on both the road and public transport network.*
It is acknowledged that an increase in pressure on the road network is likely. HS2 will add to this problem considerably with no possible benefit to the local public transport infrastructure.

2.5.9 states that: *The third LTP sets out the County Council's (Buckinghamshire CC) transport policies and strategies for the next five years (2011/12 - 2015/16). The Transport Vision is to* ***"Make Buckinghamshire a more successful, healthy and safe place to live, work and visit. Maintaining and enhancing the excellent environment, whilst ensuring that businesses thrive and grow the county's economy."***
The Proposed Scheme is contrary to the Buckinghamshire C C local transport plan.

2.5.11 states that: *The LTP Implementation Plan3 (Feb 2011) refers to the HS2 preferred route passing through Buckinghamshire and having a profound impact on the county.* ***Buckinghamshire CC is one of 19 local authorities along the Proposed Scheme route have come together to oppose the current proposals.***
See response to above.

South Bucks Core Strategy (2011)

2.5.13/14 state that: *the core strategy is based upon four key visions made up of 11 key objectives, which are the basis for the policies in the Strategy. The objectives relating to travel are:*

- *protect existing physical, social and green infrastructure and to improve infrastructure when in is needed;*
- *focus new development in accessible locations, reducing the need to travel and increasing the opportunities for walking cycling and the use of public transport;*
- *encourage more sustainable forms of transport and increase travel choice; and*
- *address traffic congestion and mitigate the amenity impacts of HGV's.*

The Proposed Scheme is contrary to the South Bucks Core Strategy on several counts.

Chilterns Core Strategy (2011)

2.5.17 states that: *The Chilterns Core Strategy was adopted in November 2011 and is based around 16 main objectives. Those relating to transport include:*

- *managing road congestion and maintaining the transport network;*
- *improving public and community transport; and*
- *enhancing sustainable access to goods and services particularly in rural areas.*

The Proposed Scheme is contrary to the South Bucks Core Strategy in that it

- adds to road congestion up until 2026
- provides no improvement to public and community transport
- rather than enhancing access to goods and services it makes access more difficult, with traffic delays, cutting access to PRoWs

Construction vehicles

4.10.4 states that: *It has been assumed that 15% of the daily deliveries of construction material and equipment occur during the **morning peak hour (08:00-09:00)** and 5% during the **evening peak hour (17:00-18:00).** This is based on typical patterns of deliveries at major construction sites. Similarly, it has been assumed that 5% of excavated material removal takes place within the morning peak hour and **20% within the evening peak hour.***

Peak times last for more than an hour. In the morning 7:00-9:00 would be a more realistic and in the afternoon school traffic builds from 15:00 leading to congestion before the evening peak. It is of great concern that 20% of tipper lorry movements will be in the (understated) evening peak period.

Part 6: Country assessment

7.3 Colne Valley (CFA7)

7.3.103 states that: *Temporary closures and diversions of PRoWs during construction are shown on Map CT-06-001 (Volume 2, Map Book 7).*

After much time searching, it seems that this map book contains no such map.

Table 7-2: Colne Valley shows the AM flows on various roads and Table 7-3: Colne Valley the PM peak flows. The latter shows six roads (including the A40) where Baseline flow was just ***one vehicle*** in the one hour period, six others (including the A412) where it was in single figures. An example.

A40 (between A412 and Denham Way)

		All	HGV			All	HGV
AM	EB	1757	53	PM	EB	1	2
	WB	1364	41		WB	1	1

Table 7-4: AM peak figures shows seven roads with just ***one vehicle in the hour*** and five others with single figure flows. Harvil Road is shown as having three vehicles NB and 4 SB in the AM peak yet 365 vehicles NB and just four SB in the PM peak period.

Table 7-5: PM peak has two roads with one vehicle in the hour and nine others in single figures.

These assessments are so obviously incorrect that further study and conclusion is meaningless. The eample given above re the A40 demonstrates this. The A40 at this point is an extremely busy road AM and PM.

This is further evidence that the ES has been prepared in a hurry and not properly reviewed Other tables are very misleading and contain jargon that is impossible for the lay person to understand. As an example 7.2.72 states: *The 2012 future traffic baseline with Proposed Scheme construction traffic flows on the strategic road network, where traffic flows (all vehicles or HGVs during either AM or PM peak) will change by 10% or more, are shown in Table 7-10 and Table 7-11 for AM and PM flows respectively*. This renders the data meaningless and so a reasoned understanding of the implications is impossible.

7.3.98 states that: *there will be rail possessions further north on the Marylebone to Aylesbury Line and to the south on the Chiltern Main Line at West Ruislip, which will affect some users of passenger services stopping at stations in this area. The possessions will be short-term and generally take place during mid-week nights or at weekends. Therefore the impacts of these possessions on rail users in this area are not forecast to be substantial* but they will be for those passengers from a wide area that use the line for leisure pursuits at the weekends. It is also a well-used route for passengers visiting Wembley Stadium. As there is no reference to rail possessions in the CFA6 section of the appendix it is impossible to know the implications for passengers using these services. No mention is made of alternative transport arrangements for these passengers.

7.3.100 states that: *bus and coach services will not be impacted by construction of the Proposed Scheme except as a result of potential additional traffic congestion and delay at locations identified above.*
This is an understatement of the impact this would have on bus and coach passengers who would be unable to seek alternative routes in order to avoid congestion and delays.

Table 7-19 outlines the effects on seven Public Rights of Way one of which is The Old Shire Lane which dates back to Saxon times. Two of these paths will be closed for up to five and a half years. The remainder will be subject to diversions adding up to 1.2kms. This is a considerable inconvenience in a precious area of countryside on the edge of London, used for recreation and leisure by many people and will have a major adverse effect on their enjoyment of this area.

7.4 The Chalfonts and Amersham (CFA8)

7.4.77 states that: *there will be rail possessions further north on the Marylebone to Aylesbury Line and to the south on the Chilton Main Line which will affect some users of passenger services stopping at stations in this area. The possessions will be short-term and generally take place during mid-week nights or at weekends. Therefore the impacts of these possessions on rail users in this area will not be substantial.*
This will be significant for those passengers from a wide area that use the line for leisure pursuits at the weekends. No mention is made of alternative transport arrangements for these passengers.

7.5 Central Chilterns (CFA9)

7.5.32 states that: *Central Chilterns construction activity phasing are summarised in Figure 7-4.*
This only shows advance works and those for the Chilterns Tunnel Main Compound and the Little Missenden vent shaft Satellite Compound but ***no activity whatsoever at the remaining sites*.**
This is yet another example of a rushed and incomplete report. This must be corrected before the second reading of the bill.

7.5.87 states that: *there will be rail possessions further north on the Marylebone to Aylesbury Line which will affect some users of passenger services stopping at the station in this area. The possessions will be short term and generally take place during mid-week nights or at weekends.*
This will be significant for those passengers from a wide area that use the line for leisure pursuits at the weekends. No mention is made of alternative transport arrangements for these passengers.

7.6 Dunsmore,Wendover & Halton (CFA10)

7.6.93 states that: *the Proposed Scheme in this study area will require temporary possessions on the Marylebone to Aylesbury Line for the construction of Small Dean viaduct and demolition of School Hill overbridge*.
There will be five possessions for a total of 81 hours between 2018 and 2020. The impacts of these possessions on those rail users affected in this area will be substantial. There are no details of any alternative transport arrangement that would be made available to those affected.
These closures were not disclosed in Volume 2 reports for CFA 7, 8, 9, 10. thus misleading the public on the impacts of the Proposed Scheme.

Volume 5 Technical Appendices

Waste and material resources assessment (WM-001-000)

Colne Valley (CFA 7)

8.2.5 states that: *The environmental effects of the total excavated material arising and its management in the Colne Valley area are reported in* ***Volume 2: CFA Report 7, Section 4 (air quality assessment), Section 12 (sound, noise and vibration assessment) and Section 13 (traffic and transport assessment)and the corresponding appendices (Volume 5: Appendices AQ-001-007, SV-003-007 and TR-001-000).*** *As there is a shortfall of excavated material in the Colne Valley area, the Chilterns Tunnel arisings are reused within the Colne Valley area.*
This is an example of the extremely complex layout of the ES makes further study both complicated and very time consuming.

8.2.6 states that: *An area of sustainable placement will be used within the Colne Valley area to permanently dispose of* ***surplus excavated material*** *generated in this area from the Proposed Scheme to avoid causing significant environmental effects associated with the road transport of that material*.
This contradicts 8.2.5 which states that: *As there is a* ***shortfall of excavated material*** *in the Colne Valley area, the Chilterns Tunnel arisings are reused within the Colne Valley area.*
Which statement is correct, a shortfall or a surplus?
The situation with regard to spoil from the tunnel is now unclear. Is this to 'sustainably dumped' near the Chiltern Tunnel south portal, or is it to be transported off site?
Considering the substantial volumes being created, this needs to be made clear in the ES.
For both options the impacts and costs need to be spelt out. i.e
How big would the spoil dump be?
Exactly where would the dump be?
How many truck movements will be needed to remove the spoil from the site?
Where will the spoil be disposed of, and have the affected communities been told?
What are the costs of dispoing of the spoil using either method?

The Chalfonts and Amersham (CFA 8)

9.2.1 states that: *the construction of the Proposed Scheme is forecast to generate a total of 3,942,531 tonnes of excavated material within the Chalfonts and Amersham area.*
9.2.3 states that: *The majority of excavated material that will be generated in the Chalfonts and Amersham area is expected to be suitable for beneficial reuse as engineering fill material or in the environmental mitigation earthworks of the Proposed Scheme either* ***within this area or elsewhere along the route****.*
9.2.4 states that: *The construction of the Proposed Scheme within the Chalfonts and Amersham area* ***may also be able to beneficially incorporate selected types of excess excavated material from other areas along the route****.*
It is not clear exactly how *3,942,531 tonnes of excavated material* as well as *selected types of excess excavated material from other areas along the route* would be used in CFA8 as the Proposed Scheme is in a tunnel through the whole area!
Have the resultant HGV trips been included in the Transport and Traffic figures?
This figure should be broken down between spoil generated from tunnelling and from creating vent shafts. The amount of spoil used in landscaping around the vent shafts should be clearly identified.

Central Chilterns (CFA 9)

10.2.1 states that: *the construction of the Proposed Scheme is forecast to generate a total of 6,976,960 tonnes of excavated material within the Central Chilterns area.*

10.2.3 states that: *The majority of excavated material that will be generated in the Central Chilterns area is expected to be suitable for beneficial reuse as engineering fill material or in the environmental mitigation earthworks of the Proposed Scheme either within this area or elsewhere along the route.*
10.2.4 states that: *The construction of the Proposed Scheme within the Central Chilterns area may also be able to beneficially* ***incorporate selected types of excess excavated material from other areas along the route.***
10.2.4 and 10.2.7 would seem to disagree. One is saying that the *balance of excess material* will be taken to a sustainable placement area at Hunts Green Farm whilst the other states *excess excavated material from other area*s could be incorporated.
10.2.7 states that: *A proportion of the excess excavated material generated within the Central Chilterns area will be transferred northwards along* ***the trace*** *to meet requirements for landscape fill south of the A413.* ***The balance*** *will be taken along* ***the trace*** *to the sustainable placement area at Hunts Green Farm.*
The term the trace is not included in the Glossary of Terms – what does it mean? There is no requirement for *landscape fill south of the A413* in this area.
The repetition of paragrapghs about the use of spoil in CFA 9 and 8 suggests that a template was used to create the Volume 5 reports by CFA, and that due to lack of time, supervision or incompetence has not updated for each specific CFA. Another example of the incompleteness of the ES.

Dunsmore, Wendover and Halton (CFA 10)

11.2.1 states that: *the construction of the Proposed Scheme is forecast to generate a total of 5,105,809 tonnes of excavated material within the Dunsmore, Wendover and Halton area.*

11.2.3 states that: *The majority of excavated material that will be generated in the Dunsmore, Wendover and Halton area is expected to be suitable for beneficial reuse as engineering fill material or in the environmental mitigation earthworks of the Proposed Scheme either within this area or elsewhere along the route.*

11.2.5 states that: *The construction of the Proposed Scheme within the Dunsmore, Wendover and Halton area may also be able to beneficially incorporate selected types of excess excavated material from other areas along the route.*

11.2.6 states that: *Excess excavated materials are anticipated to be transported from the Stoke Mandeville and Aylesbury and the Waddesdon and Quainton areas southwards to the Dunsmore, Wendover and Halton area along the construction corridor.*

11.2.7 states that: *An area of sustainable placement, near Hunt's Green Farm, will be used within the Dunsmore, Wendover and Halton area to permanently dispose of surplus excavated material generated in the Central Chilterns area from the Proposed Scheme to avoid causing significant environmental effects associated with the road transport of that material.*

12.4.25 of the CFA10 report states that: *from the north, including Stoke Mandeville and Aylesbury area (CFA11), the cumulative construction traffic flows of approximately 70 cars per day (two-way) and 10 HGV (two-way) have been included in the assessment for this area.* Does the HGV figure include those transporting this excavated material?

These statements are confusing, *5,105,809 tonnes of excavated material* will be generated in this area, which can then be used *either within this area or elsewhere along the route* yet *excess excavated materials are anticipated to be transported from the Stoke Mandeville and Aylesbury and the Waddesdon and Quainton areas.* Why would excess material be transported **to this area** when excess material from this area could be used **elsewhere along the route**?

It is also worth noting that the Volume 2 CFA 10 says nothing about excess spoil from north of the CFA being dumped in the CFA. This is misleading for the people who are responding to CFA 10, as it their local area.

This is another example of the incompleteness of the ES, and the failure to ensure that all documents made available are consistent.

This again indicates that the ES was produced in a hurry, and essential reviews were not completed.

Volume 5 - Water resources assessment

CFA7 Colne Valley (WR-002-007)

There are a number of statements that cause concern in this area. As impacts on water resources would affect the Public Water Supply (PWS) they are potentially extremely significant. The use of vague terminology and the fact that designs and management plans have still not been finalised demonstrates that the whole thing has been rushed through in order to meet a deadline. This has obviously taken precedence over the need to ensure that the Proposed Scheme will cause the minimum amount of damage – one of the instances could be ***very large and significant*** - and risks to the environment. Some of the main concerns are highlighted below.

5.2.3 states that: *The Colne Valley viaduct construction will comprise a number of piers and supporting piles at approximately 40m spacing. The piling depth is anticipated to be 20-40m and as such the piles will penetrate the top of the Newhaven and Seaford Chalk aquifers.* ***The piles could locally block groundwater flow that may in turn affect the operation of PWS abstractions, such as TH177 which will be in close proximity to the route.***

5.2.15 states that: ***It is concluded*** *that piling for the viaduct piers* ***could disturb*** *the groundwater flow regime to PWS protected by SPZ TH177 since this will be particularly close to the route. Should principal groundwater flow horizons be penetrated* ***there could be a permanent reduction in yield at the PWS.*** *The groundwater flow and, hence, the yield at the PWS source* ***could be reduced by*** *between 13 and 17.5%, based on the underlying assumptions discussed herein. The reduction in yield will give rise to a* ***major impact*** *on this very high value receptor, leading to a* ***very large and significant effect.***

5.2.27 states that: *Nonetheless, there is a* ***substantial residual risk*** *that the groundwater quality at any abstraction sources located close to underground works could be affected by Circulation fluid, turbidity or possibly contamination from boring machinery. The location of greatest concern is the Affinity Water PWS source TH177, located very close to the viaduct piers and associated piles. The impact on this very high value receptor is* ***potentially major*** *if there are significant fractures linking the pier locations and the abstraction site, this will be likely to give rise to a* ***very large effect.***

5.2.28 states that: *The measures necessary to mitigate any temporary effect of piling on the groundwater quality at TH177 and other PWS sources* ***will be agreed*** *with the Environment Agency in consultation with Affinity Water.*

5.2.29 states that: *For private licensed abstractions at significant risk due to underground works, provision of alternative temporary supplies* ***will be agreed*** *with the licensees if this is necessary.*

5.2.34 states that: *Excavated material, comprising up to 900,000m_3 of soil and rock from construction activity will be placed near South Harefield. The site sits above half of the SPZ1 and half of SPZ2 that protect TH177. As such,* ***there will be potential*** *for constituents arising from the excavated material to* ***reduce the quality of groundwater*** *in the Chalk which could impact the operation of the source within SPZ TH177.*

5.2.41 states that *The large majority of the stockpiled area sits within the SPZ1 identified as TH027 with about 60,000m2 within the SPZ2. As such, there is* ***potential for groundwater quality to be adversely affected which could impact on the use of the source within TH027,*** *particularly if there are fast pathways and fissures to the Chalk water table.*

Flood risk assessment (WR-003-007)

There are a number of statements that cause concern in this area. The use of vague terminology and the fact that designs and management plans have still not been finalised demonstrates that the whole thing has been rushed through in order to meet a deadline. This has obviously taken precedence over the need to ensure that the Proposed Scheme will cause the minimum amount of damage and risk to the environment. Some of the main concerns are highlighted below.

2.3.7 notes that: *The most significant historical flood event in Buckinghamshire was caused by high groundwater levels across the Chalk aquifers, resulting in high river flows and widespread groundwater flooding in the valleys of the Chiltern Hills.* ***The flooding occurred in the winter of 2000/2001 and is considered in the BuCC PFRA to have had "significant harmful consequences".***

2.3.8 states that: *The BuCC PFRA recognises that the construction and engineering of the Proposed Scheme* ***may have a significant impact upon surface water flows****. For example embankments and cuttings may, without suitable design solutions, impede the flow of small watercourses and surface runoff.*

2.3.17 notes that: *The SBDC SFRA*$_{15}$ *identifies* ***the Colne Valley as an area of high flood risk*** *and recommends a proactive approach in developments with developers encouraged to demonstrate a positive reduction in flood risk.*

5.1.1 states that: *The dominant feature is the Colne Valley and the associated Colne Valley Regional Park, comprising a mix of* ***protected water features*** *associated with the area's strong gravel and aggregates extraction history.*

8.2.24 states that: *A temporary jetty will be constructed across the River Colne and floodplain for construction of the viaduct.*

8.2.25 states that: *The jetty will have a* ***moderate impact*** *on high and moderate value receptors with a resulting moderate and* ***significant adverse effect.***

8.2.26 states that: *There remains the potential for the jetty to obstruct some flood flows temporarily during the construction works resulting in moderate impacts on flood risk to very high value receptors with a resulting* ***large and significant adverse effect****.*

8.2.34 states that at The Denham Water Ski Club *and the proposed temporary jetty will potentially affect water levels at this location. The clubhouse is located some distance from the edge of Flood Zone 2 and it is unlikely that flood water levels will rise sufficiently to create a risk of flooding to the building.* ***There is potentially a significant effect on the risk of flooding at the Weybeards Cottages pumping station.***

9.1.3 states that: *The Ickenham National Grid feeder station will be located within Flood Zone 3 and an area at risk of flooding in the event of failure of the Harefield No.3 Reservoir.* ***Mitigation will be required to make the feeder station resilient against flooding.***

9.1.5 states that: *During construction works flood conveyance capacity will be reduced by the presence of a temporary jetty across the River Colne resulting in a moderate impact on very high value receptors and a large and significant effect.* ***Until design of the temporary jetty is complete and the site specific flood risk management plan is agreed*** *with the Environment Agency, a* ***potentially significant temporary effect on the risk of flooding from the River Colne remains.***

9.2.1 states that: *Residual flood risks arise in situations that are not included in standard design scenarios, for example when a culvert becomes blocked causing flooding upstream. All design is generally undertaken assuming that existing infrastructure is functioning under normal conditions.* ***Consequently, there may be areas where the potential severity of flooding may exceed the design standard under certain circumstances.***

CFA8 The Chalfonts and Amersham

Water resources assessment (WR-002-008)

The key environment feature at risk in this section of the proposed route is the River Misbourne, which is noted in the Environmental Statement (CF8; 7.3.12) as being "of regional value". This chalk stream has historically shown an interrupted flow pattern as a result of the underlying complex geology and abstraction at public water sources.

Logic would normally suggest that tunnels are not constructed under valleys, which are normally selected as surface transport corridors (e.g. Bulbourne valley - A41, West Coast Mainline & Grand Union Canal). In order to alleviate the visual impact of HS2 it is proposed to enclose it in a tunnel under the Misbourne valley which, by comparison with the Bulbourne corridor example, is a totally illogical concept.

A major problem in this sector of the HS2 route is the initial crossing point through the Misbourne valley immediately to the north of Chalfont St. Giles, below Pheasant Hill. At this location the tunnel will pass below the area most adversely affected by the original route of the (pre-glacial) proto-Thames river. As a consequence of pre-glacial river action, the chalk in this area is extremely weathered with clay filled pipes and swallow holes deeply eroded into the chalk surface.

The chalk is clearly described in an existing nearby (Grid reference TQ001911) borehole log as "*firm brownish white putty chalk with some gravel size pieces of moderately weak white chalk.....(weathered Upper Chalk)*" to a depth of 16 metres below surface. Given that the depth of the tunnel crown in this area is within 22 metres of the surface then less than 6 metres of normal chalk exists above the tunnel in several places. The potential for ground surface collapse at such locations is recorded in the Environmental Statement (Appendix WR-002-008, section 4.2.10) where it states that "*Some voids may be present in the vicinity of Chalfont St Giles within disaggregated weathered Chalk, which can have a thickness of up to 16m as indicated by Morigi et al. (2005), but it is not possible to predict their presence without detailed ground investigations.*"

The placement of the Chiltern tunnel beneath the Misbourne valley at this location is highly contentious and needs to be seriously reconsidered. Detailed ground investigation in this area must be carried out before any construction work is considered.
It is clearly recorded in the Environmental Statement (Appendix WR-002-008, Table 7) that "*Tunnel construction under the River Misbourne will result in settlement with a low risk of increased vertical permeability in base of River Misbourne potentially causing increased loss in flow*." Given the natural variability in the flow of the River Misbourne it seems inevitable that any "*increased loss in flow*" will result in the disappearance of the river from ground level. It is also asserted here that the assessment of a "*low risk of increased vertical permeability*" is a gross underestimate, if not disingenuous, given the known disaggregation of the chalk immediately below surface in the part of the river valley.

The total length of the Chiltern Tunnel is below groundwater level (Appendix WR-002-008, Figure 3). It is recorded (Appendix WR-002-008, Table 7) that groundwater abstraction from licensed water sources within 1 km of the tunnel route totals in excess of 68.25 million cubic metres of water per year, equivalent to over 61.5 thousand cubic metres per day. It has been calculated that the residents of the Misbourne valley above Gerrards Cross need approximately 30,000m^3 per day of water to satisfy current requirements. Between them Thames Water and Affinity Water are licensed to abstract a maximum of 14,000m^3 per day. So already half of the basic water needs of the area have to be derived from outside the Misbourne catchment area. Any damage to the Misbourne aquifer during and after tunnelling will impact directly and immediately onto the regional water supply, which is already under resourced.

The tunnel route passes less than 30 metres below Shardeloes Lake (Appendix WR-002-008, Figure 3). It is difficult to envisage the lake surviving under these circumstances. The lake sits on the New Pit Chalk Formation which is relatively clay rich and therefore of low porosity and permeability; however this chalk formation is known regionally to be crossed by numerous sub-vertical and sub-horizontal joints and fractures, meaning that it will still act as a ground water pathway. Disturbance of such structure both during and after tunnel construction must impact on the lakes existence.

1.2.3 The main environmental features of relevance to water resources include:

- the River Misbourne, its associated catchment and floodplain;
- Shardeloes Lake - an online lake on the River Misbourne;
- a number of identifiable ponds located outside the route alignment but within 1km of the route, together with numerous small agricultural ponds within 1km of the route; and
- licensed private and public water supply groundwater abstractions and associated source protection zones (SPZ).

1.2.4 Key environmental issues relating to water resources include:

- potential impacts on groundwater flow towards public water supplies (PWS) from tunnelling activities;
- the potential for an increase in flow losses from the River Misbourne and Shardeloes Lake to the Chalk aquifer as a result of settlement due to tunnelling activities; and
- the impact of dewatering during vent shaft construction on localised groundwater flows, and surface water levels and flows in the River Misbourne and Shardeloes Lake.

4.2.8 states that: *The extent to which the tunnelling could cause settlement has been determined using predicted settlement contours. The figure suggests* ***that there could be settlement from 5-30mm where the tunnel crosses under the River Misbourne,*** *with an extent of impact of approximately 255m along the course of the river. The greatest settlement would occur where the Misbourne flows under the bridge by Pheasant Hill*.
See introduction above.

4.2.9 states that: *Figure 6 shows the potential extent of settlement at the crossing upstream of Shardeloes Lake. The overall length that could be impacted (including the River Misbourne, the small pond and Shardeloes Lake) could be approximately 535m.*

4.2.10 states that: *Within these settlement zones* ***there is potential for existing fissures and cavities such as swallow holes to be enlarged or re-activated as hydraulic pathways.*** *It is considered unlikely that any major new fissuring will occur across the whole "settlement zone" as the movement of the Chalk will simply be to move down in response to the excavation of the tunnel.* ***The exception is where a void in the Chalk above the tunnel already exists, as the void could collapse as settlement occurs resulting in fracturing and disaggregation of overlying material as the void is filled from above.*** *Some voids may be present in the vicinity of Chalfont St Giles within disaggregated weathered Chalk, which can have a thickness of up to 16m as indicated by Morigi et al. (2005), but it is not possible to predict their presence without detailed ground investigation*s.
See introduction above.

4.2.11 states that: *At Chalfont St Giles, if settlement increased the bed permeability then, when there was water in the River Misbourne,* ***the rate of water loss could be increased*** *to the underlying Chalk groundwater when the river was in a perched condition.*

4.2.12 states that: *Near Shardeloes Lake the conditions could be more complex than at Chalfont St Giles.* ***As a result of settlement there could be changes in the localised patterns of inflow to surface water from groundwater and possibly outflow from surface water to groundwater in very dry conditions.***

4.2.13 states that: .....*it should be noted that, under normal conditions,* ***monitoring the river within the vicinity of Chalfont St Giles may not provide sufficient evidence of disturbance of the Chalk and loss of river flows as the river could be dry over this reach.*** *Information will be required from monitoring data gathered up and down stream of the dry reach and from monitoring groundwater levels within the vicinity of the tunnel and River Misbourne.*

5.2.6 states that *The stockpile that will be adjacent to the M25 will have an area of approximately 6,000m2 and will overlie the Chalk Principal aquifer and the SPZ1 for TH171. The Stockpile that will be at Turners Wood will be approximately 2,500m2 and will overlie the Beaconsfield Secondary A aquifer which overlies the Chalk aquifer and the SPZ2 for TH171. The stockpile that will be west of Upper Bottom House Farm will have an area of approximately 16,500m2 and will overlie the Chalk aquifer and consequently the SPZ2 for TH028. The stockpile that will be located at Whielden Lane will have an area of approximately 700m2 and will overlie the Head Secondary A aquifer over the Chalk aquifer and consequently the SPZ3 for TH028. (5.2.7)* ***As such, there is potential for groundwater quality to be adversely affected (****by runoff of rainfall infiltrating through the stockpiles), particularly if there are fast pathways and fissures to the Chalk water table.*

Flood risk assessment (WR-003-008)

The main impact in this area is the possible increase in the risk of flooding in connection with the vent shaft in Bottom House Farm Lane, Chalfont St. Giles. 4.2.1 states that: ***No site familiarisation visits have been carried out within this study area.***
This seems to be a strange omission considering the level of possible damage which is a cause for concern as highlighted in the following section.

6.1.1 states that there was a flood event in Buckinghamshire *which is considered to have had significant harmful consequences is the groundwater dominated flood event which occurred in the winter of 2000-2001.* There were ***specific issues of river flooding from the River Misbourne, in particular, a significant historical event at Chalfont St Giles in 2001.***
There is a known historical event and so we know flooding has happened in the past.
In addition with the recent heavy rainfall, there has been flooding in Amersham, Chalfont St Giles and Chalfont St Peter.

6.1.2 states that: *There are a number of recorded incidents of surface water flooding recorded in the BuCC PFRA within the urban areas of Chalfont St Giles and Chalfont St Peter during flood events in 2006 and 2007. Additionally, there are a small number recorded within Amersham Old Town. The ChDC SFRA reports that the High Street and Broadway in Amersham Old Town suffer from surface water flooding during heavy rainfall. In Chalfont St Giles, surface water flooding of roads is reportedly due to poor drainage, raised groundwater levels and runoff from local fields. The steep topography around Chalfont St Peter means that the town is susceptible to surface water flooding which is exacerbated when groundwater levels are high. Several roads and properties have flooded in the past and the ChDC SFRA indicates that the poor state of the local drainage network could be a contributing factor.*
See 6.1.1

6.1.3 states that: ***Rising groundwater levels in the district have directly caused, or exacerbated, flooding within basements within Amersham Old Town*** *and at the foot of Gravel Hill in Chalfont St Peter.*
See 6.1.1

6.1.4 states that: *Thames Water Utilities Limited (TWUL) historical DG5 sewer flooding records show that there have been a* ***small number of sewer flooding incidents*** *within this study area.*
See 6.1.1

6.3.4 states that: *The Chalfont St Giles vent shaft and its associated access hardstanding will intersect the entire dry valley* ***preventing natural overland flow.***

6.3.6 states that: *The FMfSW indicates the potential for surface water flooding depths of greater than 0.3m in the 1 in 30 years return period (3.3% annual probability) rainfall event.* ***There will therefore be a high risk of surface water flooding to the Proposed Scheme at the Chalfont St Giles vent shaft.***

6.3.7 states that: *Bottom House Farm Lane, which is to be widened as part of the Proposed Scheme in order to allow access to the Chalfont St Giles vent shaft,* ***is at risk of surface water***

flooding *during the 1 in 30 years rainfall event in addition to the risk of river flooding from the Misbourne tributary. The FMfSW indicates that* ***deep flooding (>0.3m) is likely close to Upper Bottom House Farm and along the road adjacent to Lower Bottom House Farm.***

6.4.6 states that: *Amersham vent shaft will be situated in an area at 'moderate' risk of groundwater emergence located along Whielden Lane. This road is at risk of flooding due to groundwater emerging from the superficial, 'Secondary A' drift deposits within the dry valley and emergent flooding could extend far enough to impact upon the headhouse. There will therefore be a* ***medium risk of groundwater flooding*** *to the Proposed Scheme at Amersham vent shaft.*

6.4.7 states that: *Bottom House Farm Lane is located along a base of a valley which drains towards the River Misbourne. The BGS susceptibility to groundwater flooding maps show that the road is at* ***'very high' risk of flooding*** *due to groundwater emergence from the bedrock aquifer along the length of the valley. The bedrock formation is classified as the Lewes Nodular Chalk Formation and is designated a 'Principal Aquifer'. Since the road lies along a principal bedrock aquifer, groundwater flooding along the base of this valley has the potential to be significant.* ***Bottom House Farm Lane is therefore at a high risk of flooding from groundwater.***

7.1.2 states that: *Bottom House Farm Lane is at risk of river flooding from a tributary of the River Misbourne, however, this is not anticipated to worsen as a result of the road widening works and there* ***is expected to be no increase*** *in risk to third party receptors. Therefore, no specific mitigation will be required.*

8.2.2 states that: *The roadway at the bridge over the River Misbourne will also be widened; however,* ***the existing supporting structure will remain in place, subject to the need for strengthening works****. The potential impact of the road widening on the risk of river flooding will therefore be negligible.*
Vague terminology leads to concerns about the strength of the bridge. What exactly does *subject to the need for strengthening works mean?*

8.4.1 states that: ***There is a high risk of groundwater flooding along the length of Bottom House Farm Lane*** *as a result of emergence from the principal aquifer during times of high groundwater levels.*

8.4.4 states that: *On a more local scale, there may be a tendency for groundwater levels to rise slightly in the areas around the River Misbourne valley, due to the location of the tunnel closer to the ground surface, possibly causing spring flows to appear immediately upstream of the tunnel in some locations. The impact will be restricted to the immediate vicinity of the tunnel; however* ***this is of particular concern in Chalfont St Giles, where properties on Mill Lane lie on the upstream side of the tunnel.***

9.2.1 states that: *Residual flood risks arise in situations that are not included in standard design scenarios or infrastructure fails, for example when a culvert becomes blocked causing flooding upstream.* ***Consequently there may be areas where the potential severity of flooding may exceed the design standard under certain circumstances.***

CFA9 Central Chilterns

Water resources assessment (WR-002-009)

There are a number of statements that cause concern in this area. Some of the main concerns are highlighted below.

5.2.1 states that: *The study area will contain a number of balancing ponds that rely on infiltration to the ground as a means of discharge.*
There are approx. thirteen balancing ponds proposed in this area. These are an unnatural feature and will change the landscape in the Central Chilterns.

5.2.2 states that: *A smaller number of infiltration basins will act as the point of discharge for the track drainage from the cuttings. The runoff from rainfall within the cuttings will partly infiltrate through catchpits with the remainder passing out of the ends of the cuttings to the basins. The water quality of infiltrating track drainage is not expected to be substantially different from land drainage since the surface layer in the basin or catchpit will trap sediment and particulates. Thus, although some redistribution of the infiltration into the aquifer will occur from track drainage, the catchment areas of the cuttings will be small and* ***it is considered that this will be likely to have negligible impact on groundwater flow or quality in the Chalk aquifer.***
As it is *considered that this will be* ***likely to have negligible impact*** *on groundwater flow or quality in the Chalk aquifer* the threat remains - **unlikely but real**.

5.2.3 states that: *There will be three infiltration basins that will drain into the White Chalk groundwater. These will be adjacent to Leather Lane, King's Lane and Chesham Road. The basins that will be associated with the Leather Lane and King's Lane highways drainage will be connected to minor roads that are* ***unlikely to generate concentrations of pollutants that will significantly adversely affect groundwater quality.*** *Further to this the nearest SPZ1 for PWS will be 3.45km south of the Leather Lane drainage and 4.53km south-east of the King's Lane drainage, thereby providing sufficient attenuation and dilution within the aquifer to ensure* ***the PWS are not significantly affected.***
As it is *considered that this drainage will be* ***unlikely*** *to generate concentrations of pollutants that will significantly adversely affect groundwater quality.*
Thus the threat remains - **unlikely but real**. Similarly, the statement that *the PWS are not* ***significantly*** *affected* would suggests that the PWS would be affected if not significantly. This is not good enough in relation to the public water supply.

Flood risk assessment (WR-003-009)

There are a number of statements regarding the possibility of flooding that cause concern in this area. Some of the main ones are highlighted below.

6.3.1 states that: The *Proposed Scheme will cross a number of dry valleys and ditches within the study area that are shown to be* ***at risk of surface water flooding.***

6.3.2 states that: *These dry valleys do not have permanent watercourses but during rainfall events convey overland flow to the downstream catchment of the River Misbourne and are therefore* ***at risk of 'deep' (greater than 0.3m) surface water flooding.*** *Existing conventional*

rail and highway embankments cross the dry valleys in this area and, as a result of a loss of conveyance, are shown to cause an increased depth and extent of ***surface water flood risk on the upstream sides.***

6.3.3 states that: *The most significant dry valleys are:*

- *immediately south-east of the Little Missenden vent shaft which is* ***at risk of potentially 'deep' surface water flooding;***
- *at Mantle's Wood at the northern entrance to the Chiltern tunnel* ***which is at risk of surface water flooding****.*

6.3.6 states that: *At Mantle's Wood the route will cross an area shown on the FMfSW to be* ***at risk of 'deep' flooding from direct surface water runoff.***

6.3.8 states that: *Comparison of the FMfSW outlines with ground levels suggests a 1 in 200 years return period (0.5% annual probability) flood level of approximately 139m AOD.* ***There will, therefore, be a risk of flooding to the Proposed Scheme.***

6.3.10 states that: *At Farthings Wood the route will cross an area shown on the FMfSW to be* ***at risk of deep flooding*** *from direct surface water runoff.*

6.3.11 states that: *The top of rail level at the valley crossings will be 153.2m AOD and 156.2m AOD with the route falling from low embankment into cutting in a south-north direction. Whilst there would be a freeboard at the main valley crossing of approximately 3m,* ***there will be a risk of flooding to the Proposed Scheme at the western valley crossing.***

8.1.1 states that: *In* ***addition to the risk of flooding that exists*** *to the Proposed Scheme, there is potential for the Proposed Scheme* ***to affect the risk of flooding to third party receptors*** *by altering flow mechanics across the range of flood sources.*

8.1.2 states that: ***There is also the potential for the Proposed Scheme to change the baseline risk of flooding*** *described in the Section 6 of this report. Though designed such that the probability of the Proposed Scheme flooding in any given year is less than 1 in 1,000, any change to the baseline risk of flooding could impact on the assessment of flood risk to the Proposed Scheme.*

8.4.1 states that: *For just under 1km the Chiltern tunnel may be below groundwater levels. The scale of the tunnel, however, in relation to the depth and extent of the Chalk aquifer means that groundwater levels* ***are unlikely to be significantly affected*** *by the Proposed Scheme. The superficial deposits in the area are unproductive. The Proposed Scheme* ***is not expected to have any significant impact*** *on the risk of flooding from groundwater.*

9.2.1 states that: *Residual flood risks arise in situations that are not included in standard design scenarios, or where infrastructure fails, for example when a culvert becomes blocked causing flooding upstream.* ***Consequently, there may be areas where the potential severity of flooding may exceed the design standard under certain circumstances.***

CFA10 Dunsmore, Wendover and Halton

Water resources assessment (WR-003-010)

There are a number of statements that cause concern in this area. This is of vital importance as they will affect the risk of flooding and, more significantly, the public water supply. Some of the main concerns are highlighted below.

5.2.6 states that: *The potential for impacts depends on the position of the water table relative to the route:*

- ***there is the potential to affect water quality downstream of the route*** *(including areas where works will be above the water table since contaminants could percolate through the unsaturated zone).*

5.2.20 states that: *Springs 4 and 5 (Stoke Brook) - some flow reduction due to the interception of base flow to the headwaters will occur, particularly at the Stoke Brook source at World's End due to drawdown at the Wendover north cutting. Although all of the flow will be returned to the watercourse approximately 1km downstream of World's End, the reduction in the upstream 1km may be measurable.* ***Should this occur, it would result in a localised minor impact with a moderate and therefore significant adverse effect.***

5.2.28 states that: *Although the available groundwater elevation data suggest the water table will be below the route within the vicinity of these abstractions and thus have no potential to disrupt flow to the abstractions* ***there is potential to affect groundwater quality****, particularly if there are fast pathways through the unsaturated chalk to the water table.*

5.2.29 states that: *The draft CoCP will ensure that fluids and potential contaminants used during construction will be stored and used in such a way as to ensure that there is a negligible impact on water quality. Notwithstanding this,* ***the construction activity may lead to increased turbidity in the groundwater.***

5.2.31 states that: *The two abstractions (GWA2 and GWA3) whose quality could be affected are used for supply to the Grand Union Canal. As such, any slight increase in turbidity is not considered to adversely affect the overall quality of the canal water. Whilst the groundwater abstractions are high value receptors, the impact is considered to be minor,* ***resulting in a moderate but significant effect.***

5.2.33 states that: *It is* ***unlikely*** *that further mitigation will be required at these five abstractions but a schedule of specific monitoring should be undertaken in consultation with the well owners to verify the quality of water is satisfactory for its use.*

5.2.36 states that: *The drainage effluent will comprise land drainage* ***that should not contain constituents that will significantly adversely affect the groundwater quality.***

Flood risk assessment (WR003-010)

Section 6.4.4 (p.17) states that "*there is the potential for the Wendover green tunnel and the Wendover north cutting.....to act as groundwater sinks, with excavation up to 10 m below potential groundwater levels. There is a significant risk of flooding to these elements from the bedrock groundwater*".

By p.24 of the same document (section 8.4.1.) the impact on risk of flooding from groundwater indicates that there is "*potential*" for the tunnel and cutting to obstruct groundwater flow "*if below the water*". It states further that
"*the susceptibility of groundwater emergence from the Chalk aquifer at natural ground level is relatively low*".
These statements are both contradictory and misleading.

This tunnel and cutting will be excavated through the Grey Chalk Group. This well defined geological unit (Bailey & Wood, 2010) comprises a series of alternating claystone and limestone beds. The latter are well known throughout this region to act as major groundwater conduits, with important limestone beds (Dixoni and Doolittle Limestones) being the sources of numerous springs along the basal Chiltern escarpment. Groundwater flow should be expected to be concentrated at these levels and should they be transacted within the tunnel and associated cuttings they are likely to result in long term water ingress and heightened flood risk. This potential risk is effectively hidden, if not dismissed, in the Environmental Statement and shows a lack of knowledge regarding the local geological conditions and its impact on groundwater flow.

6.3.5 states that: *North-east of Grove Farm, the Proposed Scheme will cross an area shown on the FMfSW to be at risk of deep surface water flooding. The A413 Nash Lee Road and the Marylebone to Aylesbury line obstruct surface water flood flows* ***resulting in a significantly increased risk of surface water flooding*** *upstream of the embankments.*

6.4.3 states that: *The mapping for the Wycombe SFRA suggests* ***that there is a risk of groundwater emerging along the A413 Nash Lee Road cutting.***

9.2.1 states that: *Residual flood risks arise in situations that are not included in standard design scenarios, or infrastructure fails, for example when a culvert becomes blocked causing flooding upstream.* ***Consequently there may be areas where the potential severity of flooding may exceed the design standard under certain circumstances.***

9.2.5 states that: *At Bacombe Lane there do not appear to be any formalised culverts or significant surface water collection system associated with A413 Nash Lee Road or the conventional rail cutting crossing the dry valley* ***and the risk of surface water flooding as already is therefore absolute.***
This statement does not make sense. This is totally unacceptable.

In summary the overall flood risk assessment is considered unsatisfactory. It is full of *'could'* and '*might'* This has been confirmed by the Minister for Flooding Dan Rogerson admitting that 'the scale of flooding associated with HS2 has not been fully assessed for the first phase'. See report in the Guardian
http://www.theguardian.com/politics/2014/feb/23/hs2-may-increase-risk-of-homes-being-flooded-senior-conservatives-fear

A complete flood risk assessment should be completed before the second reading of the hybrid bill.