DEPARTMENT FOR TRANSPORT CONSULTATION

PROPOSED HIGH SPEED LINE BETWEEN LONDON TO THE WEST MIDLANDS

SUMMARY

The Environment Agency welcomes the opportunity to respond to the Department for Transport consultation on high speed rail and the initial proposal to construct a high speed line from London to the West Midlands.

Our response focuses on the environmental effects, issues and opportunities of the proposed high speed route and addresses:

- the approach used for the Appraisal of Sustainability (AoS)
- technical comment on the AoS Report (relating to environmental themes within our remit)
- local knowledge and advice about specific areas, sites, issues and opportunities along the proposed London to West Midlands route

We, Natural England and the Forestry Commission have shared and discussed our respective responses to the High Speed 2 proposals. We have referenced any common issues in our response.

We are pleased that an Appraisal of Sustainability (AoS) has been included. We agree with the overall approach taken for the appraisal. We note that you have taken on board many of the points we raised in 2009 during the development of the AoS. We have suggested some additional recommendations and provided some further advice about the AoS process.

We suggest that further assessments set out clear thresholds and levels of significance, and specific mitigation measures explaining how these reduce the significance of impacts to an acceptable level. We are pleased to note that the significant environmental effects of the proposal are to be monitored and we look forward to more details emerging on what will be monitored and how.

As acknowledged in the AoS, the proposals present potentially significant risks to water resources, in particular groundwater. The route would tunnel through sensitive groundwater resources important for both public water supply and groundwater dependant ecosystems.

We will work with departmental colleagues and the relevant water companies to develop the proposed mitigation measures so that the risk to the environment is effectively reduced and managed.

We agree with the assessment in the AoS Report that river crossings and river diversions could cause a deterioration in water quality and have an impact on river morphology and habitat. We believe there may be opportunities to align HS2 works with River Basin Management Plan actions to secure improvements in both ground and surface waterbodies. This could help achieve the objective of good ecological status set out in the Water Framework Directive. We would welcome the opportunity to work with you to help identify suitable opportunities.

We have identified a number of possible locations where there may be opportunities, as part of the proposals, to reduce flood risk and its effects on people and property. In addition to reducing flood risk, a number of the opportunities we have highlighted would also improve the river environment. We support the flood risk mitigation measures identified to reduce impacts on rivers and floodplains and we would like to work with you to provide further advice on the development of these measures.

COMMENTS ON THE APPRAISAL OF SUSTAINABILITY APPROACH

General

We are pleased that an Appraisal of Sustainability (AoS) on the proposed high speed rail route between London and the West Midlands (HS2) has been included. We agree with the overall approach taken for the AoS.

We acknowledge that a number of the issues we raised during the development of the AoS, including our responses to the AoS Scoping Report (July 2009) and to the AoS Report (November 2009) have been taken on board. We have commented on issues that do not yet appear to have been addressed and have included an additional comment regarding monitoring.

Significance thresholds

Our comments at the AoS Scoping stage advised that significance thresholds or criteria should be developed to identify the level of potential impact that HS2 would have on the environment and your related sustainability objectives. You have used ‘evaluation criteria’ (AoS Main Report Volume 2) to help identify whether an impact is likely to occur. Your evaluation, on a five level scale, ranges from an impact being ‘highly unsupportive’ to ‘highly supportive’ of the sustainability objective. However, it is not clear how you have determined where an activity or impact sits on this scale. For example the proposed route crosses over 16km of flood zone 3 and this is listed as being ‘unsupportive’ of the sustainability objective. We are not clear why this is evaluated as ‘unsupportive’ and not for example as ‘highly unsupportive’ of the objective.

We believe the level of impact that you consider to be ‘significant’ and therefore needing mitigation could also be clearer. We recommend that any further assessments set out clear thresholds and levels of significance.

Assessment scoring and mitigation

We previously recommended a transparent system of scoring and advised that it is good practice to provide scoring before and after mitigation. The Main Report,

Volume 2 explains that 'the evaluation frameworks have been updated as the proposed scheme has been improved through the incorporation of mitigation during 2010'. This suggests that scoring has been carried out based on the impact after mitigation for all the objectives (residual impact scores). We note that generic, but not specific mitigation options are discussed and various assumptions appear to have been made. For example, it is assumed that flood risk impacts will be able to be mitigated making them 'unsupportive' rather than 'highly unsupportive' of the respective sustainability objective. There also appears to be a number of significant adverse impacts (assumed to be 'highly unsupportive of objective') remaining after mitigation. For example, the Framework Summary Table in the AoS Main Report Volume 2 identifies the overall potential impacts to surface waterbodies, groundwater resources (SPZs) and groundwater flow in strategic aquifers as 'highly unsupportive of objective'.

We suggest that further assessments provide scoring before and after mitigation, set out specific mitigation measures and explain how these reduce the significance of impacts to an acceptable level.

Monitoring

We are pleased that you will monitor the significant environmental effects of the implementation of the project. However, we believe more details could be provided on what will be monitored and how. Our experience of the Government's draft National Policy Statement (NPS) Appraisals of Sustainability is that details of significant effects and how these will be monitored are included within the AoS Reports. Government departments are developing monitoring strategies. We believe this approach is also relevant for HS2.

Sustainable Design Aims

We acknowledge that these do not form part of the actual appraisal process. However, we recommend that the suggested changes set out in our previous responses are taken into account when the Sustainable Design Aims are revised. Section 2.1.3, Appendix 1 of the AoS Report suggests that these will be updated to inform more detailed design stages.

GENERAL TECHNICAL COMMENTS

Climatic factors

It should be noted that the current allowance for climate change increases flood *flows* by 20%, not flood *levels* (Volume1, AoS Main Report, Section 8.2.4). The level of flooding will be determined by the overall catchment characteristics so a uniform increase in levels will not necessarily apply.

The Environment Agency has developed a carbon calculator which calculates the embodied carbon dioxide of materials plus carbon dioxide associated with their transportation. It also considers site energy use and waste management. This may be a useful tool to help inform the detailed assessment and design stage of the proposed scheme. The tool is available at http://www.environment-agency.gov.uk/business/sectors/37543.aspx.

Biodiversity

We support the mitigation measures set out in the 'Summary of generic mitigation measures for biodiversity' (Volume 1, AoS Main Report, Section 8.6) particularly the use of clear span bridges. It is possible that the scheme could have cumulative impacts over time resulting from a large number of smaller sites. We recommend that a full assessment of cumulative impacts is carried out and appropriate mitigation measures proposed.

We support the mitigation option to set up a fund for the long term management and enhancement of key sites. We would like to work with you to discuss the potential for habitat creation or enhancement of existing habitat. In Appendix 1 we have highlighted some specific potential opportunities. One of the tools which may help inform this discussion are the Regional Habitat Creation Programmes produced by us in consultation with Natural England. We suggest that the habitat creation opportunities be aligned with Natural England's aspirations and advice about improving green infrastructure and connections between green infrastructure along the proposed route.

We recommend that the potential for protected habitats that are groundwater dependent to be affected by the route if the line intersects groundwater supplies and flow paths, is assessed at the next stage This links to the potential impacts identified in Section 8.7 of the AoS Main Report Volume 1. For example, Section 8.6.6 of the report refers to a large area of wet woodland (North and South Cubbington Woods north-east of Leamington Spa) which would be crossed by the route, as well as sites such as North Wood Local Nature Reserve, Berkswell Marsh Site of Special Scientific Interest and Park Hall Site of Nature Conservation Interest which are likely to be very close to the proposed track. We recommend that further design work could be undertaken to avoid, minimise, and where necessary compensate, for these possible impacts. For example, by further local investigation leading to changes to route alignment, the use of viaducts or creation of alternative wetland areas. In addition to the sites listed above, in Appendix 1 we have identified some further groundwater dependent sites that we believe could be considered in further assessments.

Water resources

We note that the AoS main report has separated surface and groundwater issues. It should be recognised however that groundwater provides the base flow for rivers and surface water recharges ground water and that there is an interdependency between surface and ground water. You have recognised this relationship to an extent in AoS Technical Reports (AoS Appendix 5) and we recommend this interdependency is reflected in future assessments.

<u>Water supply for people and the environment</u>

The AoS Main Report, Volume 1, Section 8.7 acknowledges the potential adverse impacts of tunnelling through underground water bearing rock or aquifers and that the scheme is likely to require cutting or tunnelling through groundwater areas that are vulnerable to any contamination (Source Protection Zones 1 and 2). We are concerned that the tunnelling works through the chalk and other aquifers may impact

on water supply abstractions (i.e. yield may be reduced and/or quality affected) and the needs of the environment (e.g. chalk streams).

We have a duty to secure the proper and efficient use of water resources in England and Wales and act as an advisor to water companies on water supply issues. Water companies have a statutory duty to develop and maintain efficient and economical water supply systems. Some water companies are heavily reliant on groundwater for public water supply. For example, Veolia Water Central abstracts 60% of its water from groundwater sources. We therefore recommend that detailed measures to ensure that public water supplies are secured and protected are set out at the next stage of the project. This is particularly important where the route passes close to water abstraction points and associated sensitive groundwater areas. In Appendix 1 we have identified some particular water abstraction points in proximity to the proposed route. We believe it would be appropriate for you to work with Veolia Water Central and Thames Water on their consultation responses to help address this issue and agree related monitoring, mitigation and potential compensation arrangements. We also believe that discussions with the other water companies, including Anglian Water, Severn Trent Water and South Staffordshire Water would be beneficial.

The proposed high speed route runs (in cuttings and tunnels) near to sensitive groundwater dependent habitats, including chalk streams like the River Misbourne. We recommend that detailed investigations are carried out of the chalk and other aquifers that will potentially be affected to ensure that tunnelling does not adversely impact on water supplies and the flow and ecology of rivers or other waterbodies.

We have experience from the Channel Tunnel Rail Link project, which involved tunnelling and cutting in the chalk in Kent that we are happy to share with you to reduce the risks to groundwater and abstraction points, for example through construction practices. We would also like to explore other opportunities with you to reduce these risks and protect the environment, for example, the relocation of abstraction wells.

There will also be a number of private groundwater abstractions along the route that could be affected by the works. We hold records of boreholes and groundwater abstractions that may help you in assessing any impact on them. The local authorities may also hold some details of potable groundwater abstractions.

There are a number of open and closed loop Ground Source Heat Pump (GSHP) systems in proximity to the route. We suggest that the risks to these systems are assessed to fully consider any possible impacts on groundwater.

Groundwater monitoring

We and the British Geological Society hold some data on groundwater levels. We would be happy to provide our data. If existing groundwater monitoring boreholes are likely to be impacted by the works we recommend these be replaced or relocated.

Dewatering

We recognise that dewatering may be necessary as part of the route construction. This could affect licensed abstractors (including public water supply abstractors). We recommend that further assessment identifies the potential environmental effects and mitigation measures to address possible negative impacts. This assessment could also consider the impacts of dewatering on water dependant ecosystems, for example, wetlands and chalk streams.

Water Quality

We recommend that any work affecting the channel or morphology of watercourses considers the impact on water quality during and after the construction phase. We also recommend that an assessment of the potential construction and operational impacts of the scheme on water quality is undertaken for each section of the route at the next stage.

During the construction and operational phase of the project, the water environment could be at risk of contamination from pesticides, oils, fuels and chemicals stored and used near the track. We suggest that consideration be given to the design of the track drainage system to enable contaminants to be retained to prevent pollution of receiving watercourses. There also appear to be significant earthworks during the construction phase which we believe will present a risk of silt pollution to local watercourses.

We note that the generic mitigation measures in Section 8.8 mention controlling impacts through a code of practice for construction. We have produced comprehensive Pollution Prevention Guidance and would be pleased to advise on how this can be used to help manage these risks, and to identify suitable mitigation measures.

Water Framework Directive

We recommend that more weight is given in future assessments to the requirements of the Water Framework Directive (WFD) as set out in our River Basin Management Plans (RBMPs). As well as requiring all water bodies to be moving towards good ecological status or potential, the WFD requires that there is no deterioration from the 2009 baseline. We can provide details of waterbody status, of current and proposed WFD investigations and actions in the RBMP for the waterbodies along the route. There may be opportunities to align HS2 works with RBMP actions to secure improvements in both ground and surface waterbodies to help achieve good ecological status. We would like to work with you to help identify suitable opportunities.

We agree with the assessment in the AoS Report that river crossings and river diversions could cause a deterioration to water quality and impact on river morphology and habitat. We support the generic mitigation measure, listed in the text box in Section 8.8 of Volume 1 of the AoS Main Report, which suggests opportunities will be taken to improve habitats through river diversions. We recommend that further assessment is carried out at an early stage to confirm the potential impacts and required mitigation measures for the likely significant effects on river morphology, the

riparian habitat and water quality identified in the Framework Summary table (AoS Main Report, Volume 2, Section 6). We suggest that wherever possible river diversions should help contribute to meeting good status in any of the impacted water bodies, in line with WFD requirements.

The major works associated with moving the River Tame for example, discussed in Section 8.7.5 of the AoS Main Report, could bring significant benefits to the water environment and local communities. We would be keen to work with you to help design a scheme that aligns with and complements other environmental schemes, such as the Environment Agency River Tame Strategy. http://www.environment-agency.gov.uk/research/library/consultations/107416.aspx and leads to an improvement in the ecological status of this waterbody.

Water infrastructure

The scheme may impact on existing or planned water infrastructure. The scheme could impact on a number of strategic water supply mains and the sewerage network or infrastructure planned as part of approved developments. We recommend that these issues are assessed as part of the next stage of the scheme. As the scheme develops we suggest the relevant water companies are consulted to discuss the possible implications for their assets.

Flood risk

Sources of flooding

Section 3.2.2 of the AoS Appendix 5 (Technical Reports) discusses the assumptions and limitations with the use of Environment Agency Flood Zones. It should be noted that these only show the likelihood of flooding from rivers and the sea. Other sources of flooding (including groundwater and surface water) can occur in a wider variety of places and can be difficult to predict. As the Pitt Review identified, surface water is a significant cause of flooding, particularly in urban areas. To ensure that other sources of flooding are identified and used to assess flood risk and inform the design at the next stage, we recommend that Surface Water Management Plans and/or Preliminary Flood Risk Assessments, where available, are used in addition to Strategic Flood Risk Assessments. These can be obtained from the relevant local authorities. Where Surface Water Management Plans do not yet exist, our Flood Map for Surface Water could also help identify areas at risk from surface flooding. We also suggest that you liaise with the Lead Local Flood Authorities (county and unitary authorities) regarding surface and groundwater flood risk issues and flooding from 'ordinary watercourses'. We would be happy to provide more information about our role and that of Lead Local Flood Authorities.

River and floodplain crossings

The generic mitigation measures in Sections 8.2 and 8.8, Volume 1 of the AoS Main Report, suggest that consideration could be given to 'the design of surface crossings to reduce impediments to flood flows' and 'level for level compensation of flood plain storage' could be considered to preserve floodplain capacity. The proposed route would cross 16.2km of the highest risk Flood Zone 3. Planning Policy Statement 25: Planning and Flood Risk (PPS25), states that development should only take place in

Flood Zone 3 if there are no other suitable options for development, or if there is an over-riding public interest. Developments in Flood Zone 3, if not properly mitigated, can put property at risk and can increase the risk of downstream flooding. We therefore advise that, in line with the requirements of PPS25, later detailed design stages consider the design, construction and maintenance of any raised sections of track through floodplain areas, including those on viaducts. Also that mitigation/compensation is provided as suggested to ensure that flood risk is not increased to existing properties.

We would like to work with you to agree the principles and details for river and floodplain crossings to help ensure that flood risk is not increased and river environments are safeguarded. We have flood modelling information for a number of areas that we could share with you to aid understanding and assessment at the detailed design stage.

Opportunities to reduce flood risk

We would like to explore opportunities to reduce flood risk, in line with the AoS flood risk objective to 'Conserve and enhance the capacity of floodplains'. We recommend that opportunities are identified wherever possible to reduce flood risk. This is in line with the requirements of PPS25 and actions in the Environment Agency's Catchment Flood Risk Management Plans (CFMPs) which identify redevelopment opportunities as a key way to reduce flood risk. We have highlighted some potential opportunities in Appendix 1.

Culverting

We support your intention to avoid culverting as stated in the generic mitigation measures, listed in Section 8. 8, Volume 1 of the AoS Main Report.

Sustainable drainage systems

The generic mitigation measures, listed in Section 8.8, Volume 1 of the AoS Main Report, suggest that 'Sustainable drainage systems (SUDS) could be applied on both the tracks and for supporting infrastructure'. We recommend that SUDS are used wherever practicable to manage runoff and provide multiple-benefits. This is in line with the requirements of the Flood and Water Management Act 2010 which encourage SUDS to be used in developments unless there are practical reasons for not doing so.

Soil and Land Resources

Section 8.17 of the AoS Main Report Volume 1 discusses the potential benefits that would accrue from the productive use of former landfill sites. It states that 16 such sites, of just under 146 ha in total, would be crossed by the proposed scheme. We and local authorities can provide information on landfill sites and other waste management sites that may affected by the scheme. We would also be happy to provide advice to help ensure that the environmental risks associated with the development of potentially contaminated land are managed and opportunities for remediation taken.

Waste generation

The waste and resource use sections are separate in the AoS Main Report Volume 1 however they are closely linked, given resource use efficiency has a great bearing on waste generation and that materials considered in one process can be a resource for another. We recommend that future assessments consider these topics jointly as waste and resource management.

In line with the principles of the Waste Hierarchy, we recommend that the scheme could aspire to the concept of zero waste to landfill. We welcome the approach set out in Section 8.18 and recommend this is applied to all waste streams.

We recommend that the availability of waste management and disposal sites and other waste infrastructure which may be needed to manage the construction and operational phase of the scheme is considered as early as possible. This will include temporary waste facilities during the construction phase which will require permitting, for which we can provide advice. Because of the potential to generate fairly large quantities of spoil within a short timeframe on each section of the project, we would suggest that the Site Waste Management Plan (SWMP) (referred to in Volume 1 of the AoS Main Report, Section 8.18) should reflect this by addressing each of the route sections considered in the Proposed Route Framework table (Volume 2 of the AoS Main Report). This should help to focus effort on those sections where most spoil will be generated as early as possible in the process. Because a lot of the tunnelling will be carried out in urban areas, we recommend considering transport routes and suitable sites for treatment/disposal, along with planning and permitting requirements, as early as possible. We believe consideration of SWMPs as part of the design stage could help maximise resource efficiency and waste prevention. Although there is not sufficient evidence as yet, to determine the likely generation of other waste streams, including hazardous waste, early consideration of disposal points and requirements for storage is advisable, as there are few facilities for handling hazardous waste and they are not evenly spread geographically.

We suggest that opportunities are taken at the detailed design stage to design-out the typical rail side “litter traps” and flytipping opportunities that can affect rail lines. As well as the visual impact, there are operational costs associated with clearing litter and other wastes.

Resource use

We support the statements in Volume 1 (Section 8.19) and Volume 2 (Proposed Route Framework table) of the AoS Main Report on the potential to make more efficient use of resources, re-use materials, and use sustainable materials. However any project of this scale looking towards green procurement is likely to have a significant impact on demand, especially where products may be produced locally, which would be a preference where practicable. An example of this might be recycled aggregates. We therefore advise that an early signal of intention should be provided to allow for processors to increase production and/or storage capability.

Section 8.19.2 of the AoS Main Report Volume 1 recognises that demolition waste can be reused. This could apply to a range of other waste streams. The AoS Main Report Volume 1, Section 8.19.3 makes reference to the uncertainty around the

quantity of materials which will be required, and recognises that recycled steel and aggregates could be used in the construction phase. Primary materials such as steel and cement, and primary aggregates, are also likely to be required in large quantities. Mineral extraction, iron and cement manufacture, and transportation of materials, will all have environmental impacts, including significant CO_2 emissions, associated with them. We recommend that these impacts are assessed as early as possible as they may be significant on a national and local scale.

Consents and Environmental Permits

This scheme is likely to require a range of environmental permits during the construction, and potentially the operational phases. These could include discharging effluent to watercourses, dewatering activities, new or relocated groundwater abstractions, works affecting rivers and floodplains, and waste management activities. We will be happy to advise on these and other permitting requirements. We recognise that, similar to previous hybrid bill schemes (e.g. Channel Tunnel Rail Link, Crossrail), some of our normal permitting powers may be removed and then re-created as part of protective provisions in the Bill. We would like to discuss any such effects and provisions with you in due course.

FURTHER INFORMATION

Further information or background to this response can be obtained from Charles Thompson, HS2 Project Manager either by telephone on 01707 632487 or by e-mail at charles.thompson@environment.agency.gov.uk

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