
High Speed Rail
(London-West Midlands)
Environmental Minimum Requirements
Annex 4:
Environmental Memorandum





Department for Transport

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High Speed Two (HS2) Limited,
Two Snowhill,
Snow Hill Queensway,
Birmingham B4 6GA

Telephone: 020 7944 4908

General email enquiries: HS2enquiries@hs2.org.uk

Website: www.gov.uk/hs2

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1 Introduction

1.1 General introduction

1.1.1 This Memorandum relates to the environmental aspects of the design and construction of Phase One of HS2. It builds upon discussions which have taken place between HS2 Ltd and representatives of the National Environmental Forum comprising the Agencies (Historic England, Environment Agency and Natural England) and representatives from relevant Government departments, including the Forestry Commission. These parties intend to continue to have clear and open discussion during the ongoing design and construction phases of Phase One of HS2.

1.1.2 The terms of this Memorandum have also been discussed with the local authorities along the route.

1.2 Scope of the Memorandum

1.2.1 This Memorandum is concerned with the impacts of Phase One of HS2 on the following:

- nature conservation;
- terrestrial and aquatic ecology;
- water resources and flood risk;
- geological features;
- recreation and amenity impacts;
- landscape and visual;
- public open space;
- soils;
- agricultural and forestry land; and
- excavated material.

1.2.2 It is intended that the Environmental Memorandum is entirely consistent with the High Speed Rail (London - West Midlands) Act and does not duplicate provisions therein (for example, Protective Provisions in Schedule 33). Should there be any perceived conflict between this Memorandum and the Act, the Act will take precedence.

1.2.3 It is not intended that this Memorandum duplicate other components of the Environmental Minimum Requirements (EMRs).

1.2.4 The other components of the EMRs are described in paragraph 3.1.1 of the EMR General Principles document. These include requirements on the nominated undertaker to comply with the Planning Memorandum, the Heritage Memorandum and Undertakings and Assurances concerning the project specified in the register of

undertakings and assurances, and to adopt and implement the Code of Construction Practice (CoCP).

1.3 Purpose and understanding

- 1.3.1 The Environmental Memorandum provides a framework for the nominated undertaker and representatives of the National Environment Forum to work together to ensure that the design and construction of Phase One of HS2 is carried out with due regard for environmental considerations, including the historic environment.
- 1.3.2 Until such time as a nominated undertaker is appointed, the Department for Transport will fulfil the nominated undertaker's role.
- 1.3.3 The parties to this Memorandum have therefore reached an understanding as to:
- the aims to control and limit the environmental effects of constructing Phase One of HS2;
 - the mechanisms for ensuring consultation and liaison between the parties, monitoring of the impacts of the construction of Phase One of HS2, monitoring of the post construction performance of mitigation and compliance with (amongst other things) the environmental provisions in the High Speed Rail (London - West Midlands) Act as outlined in the HS2 Information Paper *E1: Control of Environmental Impacts*; and
 - the principles to be followed to achieve the aims during the ongoing design and construction of Phase One of HS2.
- 1.3.4 The nominated undertaker and the Forum members will agree to take all reasonable steps to achieve the aims of this Memorandum, through subscribing to the mechanisms and principles set out below.

2 Aims

- 2.1.1 The nominated undertaker and the representatives of the National Environmental Forum agree to the following environmental aims for the design and construction stage of Phase One of HS2:
- to design and construct Phase One of HS2 such that significant environmental effects are eliminated, controlled or reduced where reasonably practicable;
 - to prevent environmental risks and avoid or control the extent of environmental damage by developing mitigation measures to an appropriate standard and monitoring and enforcing them effectively;
 - to address sustainability principles in on-going design development, taking opportunities for environmental enhancement and compensation where practicable and reasonable; and
 - in doing so, recognise that the nominated undertaker will take a responsible

approach to balancing the achievement of environmental principles set out in Section 4 with the overall objectives of Phase One of HS2.

2.1.2 The mechanisms for achieving these aims are set out in Section 3.

3 Mechanisms

3.1 National Environmental Forum

3.1.1 A National Environmental Forum will continue to meet throughout the design and construction period and up to one year post-commissioning, unless agreed by the Forum that further meetings are no longer required. The Forum will provide a framework for early and effective consultation with the member agencies and will keep them apprised of progress and issues. It will assist in the execution of this Memorandum, including advising on:

- the strategic approach for avoidance or mitigation of adverse effects on those matters identified in 1.2.1; and
- the strategic programme for monitoring the environmental effects of the Project, and periodic review of results.

3.1.2 The terms of reference and the function of the National Environment Forum will be reviewed as appropriate as the project develops.

3.2 Engagement

3.2.1 The Protective Provisions to the High Speed Rail (London - West Midlands) Act (as set out in Schedule 33) contain specific timescales for the nominated undertaker and specified Agencies to respond to plans and method statements (or the approval of the Agencies is deemed to have been given). It is understood that such timescales are necessary to the timely delivery of the Phase One of HS2.

3.2.2 However, notwithstanding these statutory timescales, the nominated undertaker and the Agencies will undertake early consultation on environmental issues, as far as reasonably practicable, to ensure that the best practicable environmental solution is achieved.

3.2.3 The nominated undertaker will take the primary role in circulating available information of relevance to the Agencies in performing their regulatory and advisory duties. So far as permitted to do so by law, the Agencies will provide the nominated undertaker with all relevant information they possess.

3.2.4 The nominated undertaker and the Agencies will each identify named individuals who will be the 'single point of contact' between the parties. The nominated undertaker will inform the Agencies of the person in control of the works if reference is made to such a person within their respective Protective Provisions.

- 3.2.5 The nominated undertaker and the Agencies will ensure that constructive dialogue continues throughout the various stages of Phase One of HS2 through agreed consultation and liaison mechanisms as set out in this Memorandum.

3.3 Interrelationship between National Environmental Forum and Planning Forum

- 3.3.1 For qualifying authorities, the Planning Memorandum sets out the principles to be taken into account as material considerations in the determination of requests for the approval of details. However, the nominated undertaker will involve relevant Agencies on applications to planning authorities and circulate information of relevance to the Agencies at the same time as submitting for planning approval.
- 3.3.2 As far as reasonably practicable, the nominated undertaker will co-ordinate submission of Agency permits or licences and planning applications.

3.4 Code of Construction Practice

- 3.4.1 The CoCP sets out specific details and working practices that apply to site preparation (including site investigation and remediation, where appropriate), demolition, material delivery, management of excavated materials including surplus excavated material, waste removal and all related engineering and construction activities. Subject to any specific requirements arising under protective provisions, these will be the arrangements by which the nominated undertaker and its contractors will be required to work.
- 3.4.2 The CoCP will be supported by Local Environmental Management Plans (LEMPs) which will include a number of specific measures by topic, relevant to each relevant local authority area.

3.5 Environmental management system - overview

- 3.5.1 As part of HS2 Ltd's Sustainability Policy, the nominated undertaker will develop an environmental management system (EMS) in accordance with BS EN ISO 14001. The EMS provides the processes by which environmental management, both within the nominated undertaker's organisation and in relation to its operations, is undertaken to ensure the relevant findings of the Environmental Statement are addressed through the construction phase. The EMS will set out:

- the procedures to be implemented to plan and monitor compliance with environmental legislation;
- the key environmental aspects of the work and how they will be managed;
- staff competence and awareness requirements and how these are achieved and maintained;
- record keeping arrangements, including reporting to the Sponsor;
- the procedures to be implemented to monitor compliance with the environmental provisions in the Act; and

- monitoring compliance and the effectiveness of the measures included within the CoCP, the nominated undertaker’s environmental policy and with all the Environmental Minimum Requirements other than non-environmental aspects of undertakings and assurances.

3.5.2 The nominated undertaker will require each of its lead contractors to have an EMS certified to BS EN ISO14001. Their EMS will include roles and responsibilities, together with appropriate control measures and monitoring systems to be employed during planning and constructing the works for all relevant topic areas covered by the HS2 Phase One Environmental Statement. Where the lead contractor is a joint venture, the EMS will be certified to cover the activities of the joint venture.

3.5.3 Environmental criteria appropriate to the scale and nature of the nominated undertaker’s construction requirements will be used at tender stage to ensure that environmental considerations are taken account of in the awarding of contracts.

3.6 Control of environmental effects

3.6.1 It is the intention of the Secretary of State to carry out Phase One of HS2 so that its environmental effects are no greater than as assessed in the HS2 Phase One Environmental Statement. The mechanisms established to control this objective are explained in the HS2 Information Paper *E1: Control of Environmental Impacts*.

3.7 Interpretation

3.7.1 Without prejudice to the exercise of their statutory functions, the nominated undertaker and the Agencies are committed to trying to resolve any differences of opinion as to the interpretation of the Environmental Memorandum through discussion.

4 Principles

4.1 Introduction

4.1.1 The principles by which future environmental decisions on Phase One of HS2 will be taken include the following:

4.2 Sustainability

4.2.1 All work shall be carried out in accordance with the HS2 Ltd Sustainability Policy and its associated commitments. Stations, depots and other railway buildings shall be designed and constructed to achieve an ‘Excellent’ rating under BREEAM New Construction Non Domestic Buildings Scheme, whereas the infrastructure works – Enabling Works, Main Works Civils and Rail Systems – will be designed and constructed to meet BREEAM Infrastructure (Pilot) scheme with the aspiration to achieve an ‘Excellent’ rating.

4.2.2 Through the EMS the nominated undertaker will develop, and keep under regular review, environmental objectives which address this sustainability agenda.

Achievement of these objectives during ongoing design and construction stages will be monitored and periodically reported to the National Environmental Forum.

4.3 Use of land

4.3.1 As the design is developed, the nominated undertaker through its contractors and so far as is reasonably practicable will seek to reduce land taken from habitats, sites of nature conservation or geological importance, public open space and best and most versatile agricultural land. This includes seeking to reduce impacts on protected species.

4.3.2 The principles of the 'mitigation hierarchy' are consistent with the National Planning Policy Framework, and guidance on Environmental Impact Assessment will be followed throughout design development. For more information on the mitigation hierarchy, see Information Paper *E28: Mitigation and Compensation*.

4.4 Integrated environmental approach

4.4.1 An integrated environmental approach will be adopted as the design is developed, taking account of environmental principles within this document, land use, and other environmental issues as set out in other parts of the EMRs, as appropriate.

4.4.2 Section 5 identifies the priorities for key environmentally sensitive worksites. Whilst all environmental issues will be considered at these and other sites, the nominated undertaker and the Agencies acknowledge the necessity of striking a balance between environmental interests and the needs of the project as it is built.

4.4.3 Opportunities for environmental enhancement will be identified and implemented where related to the impacts of the project and where they are considered reasonable and practicable.

4.5 Site reinstatement

4.5.1 The High Speed Rail (London - West Midlands) Act requires that, upon completion of construction works, where temporary possession of sites has been undertaken, they shall be returned to a condition in accordance with a scheme to be agreed with both the owners of the land and the relevant planning authority. In a case where the site has been permanently acquired, it must, after use has finished, be restored in accordance with the scheme agreed with the relevant planning authority.

4.5.2 In addition, the High Speed Rail (London - West Midlands) Act also requires that, upon completion of the principal permanent works, the sites of those works will be subject to a 'Bringing Into Use' request from the planning authority in order to ensure that appropriate mitigation has been incorporated into the scheme.

4.5.3 Site reinstatement shall follow the requirements set out in the CoCP. For specific worksites, as set out in Section 5, where loss of vegetation, trees or ecological habitat is a concern, the nominated undertaker will be required to address these features as part of the LEMPs in accordance with the practices required under the CoCP.

4.6 Landscape and visual

4.6.1 The nominated undertaker will be committed to high quality design that is sensitive to the landscape character of the local area, including the historic environment, to avoid and minimise effects as much as reasonably practicable.

4.6.2 The nominated undertaker will design the landscape and external spaces in line with the principles and promoter's requirements as set out in HS2 Information Paper *D1: Design Policy*. In particular, DfT and the nominated undertaker will seek to ensure that:

- the design of all landscape and external spaces will be safe, efficient, and meet the requirements of whole-life operation and maintenance alongside initial buildability;
- the design of all landscape and external spaces will contribute to the government's pursuit of sustainable development, as set out in the National Planning Policy Framework, which involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life;
- the design cohesion of all landscape and external spaces will be achieved through a strong aesthetic ethos and a recognisable architectural language;
- the design of all landscape and external spaces will be developed through engagement to seek people's views and ideas on the aesthetic design of the visible buildings and permanent structures;
- the design of all landscape and external spaces will consider the passenger experience;
- the design of all landscape and external spaces will limit adverse environmental and visual impacts during design construction and operation; and
- where possible, the landscape design will identify additional potential regeneration opportunities within area planning frameworks.

4.6.3 Landscape design should be appropriate to the local landscape, historic and ecological character along the route. Existing trees and vegetation on temporary worksites which are lost as a result of construction, will be replaced with appropriate species.

4.6.4 Preference will be given to native species typical of the area, except for ornamental or specimen planting areas, while giving consideration to climate change. All new trees and vegetation will be resilient to disease.

4.6.5 All planting will be done in line with the Green Infrastructure (GI) concept, a form of environmental best practice and policy that has been used to inform HS2 Ltd's approach to developing Phase One of HS2. Where the GI approach is applied to the Phase One line of route, this will also be referred to as a 'green' or 'environmental corridor', of which landscape planting will form a major part. The environmental or

green corridor is integral to HS2's aim of leaving a positive route legacy. For further detail, see HS2 Information Paper *E11: Green Infrastructure and the Green Corridor*.

- 4.6.6 In order that landscape planting is as effective as reasonably practicable on commissioning of Phase One of HS2, the nominated undertaker will put in place planting and other screening measures in advance of or during construction (with the landowner's permission), where this is reasonably practicable and where there is no conflict with the construction programme or other construction requirements.
- 4.6.7 Where early visual screening is a key consideration, species to provide rapid growth will be provided. Species will be selected to complement the local landscape, historic and ecological character where there is no overriding conflict with operational requirements, and will be supported by the planting of slower-growing species. Where appropriate, the nominated undertaker will draw up and implement a programme for the thinning or removal of early-growth species.
- 4.6.8 The nominated undertaker will put in place measures at an early date to ensure that sufficient stock of appropriate maturity and provenance is available.
- 4.6.9 Sites referred to in Section 5 will be the subject of the LEMPs with priority given to landscape considerations where indicated. The nominated undertaker will maintain or make provision to maintain and monitor the new or managed planting, for a period as agreed with NEF Members in line with the principles set out in HS2 Information Paper *E16: Maintenance of Landscaped Areas*.
- 4.6.10 The nominated undertaker shall maintain to an appropriate horticultural standard landscaped areas to ensure that the project's essential planting scheme successfully establishes and develops to achieve its mitigation objective, and maintain for an appropriate period of time in-line with principles set out in HS2 Information Paper *E16: Maintenance of Landscaped Areas*.
- 4.6.11 Where agreement can be reached after an initial period of maintenance, the nominated undertaker will seek to return the majority of land to previous landowners or other interested parties to ensure the continued objectives of landscaped areas are maintained into the future.
- 4.6.12 Where agreement cannot be reached, the land will be retained and maintained by the nominated undertaker until agreement is put in place with a suitable owner or party. This could mean that such land will remain under the ownership of the railway.
- 4.6.13 Where practicable, the nominated undertaker will reduce the long-term maintenance cost for the railway operator whilst ensuring that the essential mitigation remains in place and effective.
- 4.6.14 Tree planting will be designed to minimise risks to the operation of the railway that may arise from falling leaves, root damage and high winds breaking branches or felling trees in the vicinity. In practice, this means a 'zone of influence' will be established along HS2, within which the height of vegetation will be limited.

- 4.6.15 Where reasonably practicable, structures, fencing, bunding and acoustic screening will be sensitively designed to be both effective and sympathetic to the local environment.
- 4.6.16 Where practicable, new planting will not take place where it is likely to cause damage to significant buried archaeological remains. Where it is not possible to avoid buried archaeological remains, they will be investigated and recorded in accordance with the commitments set out in the heritage memorandum.

4.7 Public open space

- 4.7.1 In a number of locations, public open space will be required for construction of Phase One of HS2. Public open space includes formal and informal parks and playing fields. The measures set out in Section 4.5 on Site Restoration above apply to public open space.
- 4.7.2 Where there would be a temporary but significant effect on a community resulting from the temporary loss of public open space, mitigation is likely to take one of the following forms:
- improvements or alterations to the remaining portion of the public open space (in instances where the public open space is partially occupied and limits primary use), or community facilities, e.g. reconfiguring pitch layouts or relocating play areas;
 - improvements to other public open spaces or community facilities in the area;
 - improving accessibility to other existing public open space or community facilities; and
 - identify land owned by the relevant local authority that could be brought into use as public open space or community facilities with its agreement.
- 4.7.3 Where there would be a permanent significant community effect resulting from the permanent loss of public open space, mitigation is likely to take one of the following forms:
- improvements or alterations to the remaining portion of the public open space (in instances where the public open space is partially occupied) or community facility, e.g. reconfiguring pitch layouts or relocating play areas;
 - provision of compensation open space or community facilities built into the design of the permanent works within Act limits;
 - improvements to other public open spaces or community facilities in the area;
 - improving accessibility to other existing public open space or community facilities; and
 - land owned by the relevant local authority to be brought into use as public open space or community facilities with its agreement.
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4.7.4 Where none of these other mitigation measures can provide suitable mitigation the Secretary of State could potentially acquire land for the mitigation of permanent significant effects on community facilities.

4.7.5 The nominated undertaker will design public open spaces in line with the principles and promoters requirements as set out in HS2 Information Paper *D1: Design Policy*.

4.8 Nature conservation

4.8.1 Where effects on protected species are identified, the appropriate licenses will be obtained from Natural England prior to any works being undertaken. This includes species protected by the Habitats Regulations 2010 and the Wildlife and Countryside Act 1981.

4.8.2 To ensure that the requirements of the species protection legislation are taken into account during consideration of the Act, sufficient information will be submitted to Natural England to enable it to consider whether appropriate measures are in place.

4.8.3 The nominated undertaker will prepare Ecology Site Management Plans at detailed design stage and prior to any works commencing on site. These will specify the ecological objectives of each ecological habitat creation area, the measures to be taken to establish and maintain these habitats, the detailed planting requirements and the monitoring regime for each, in order to measure success. The Ecology Site Management Plans will also be prepared for each statutory and non-statutory site of nature conservation importance and ancient woodland affected by construction. These will include measures to reduce effects. Drafts of these management plans will be discussed with relevant environmental bodies, including the Forestry Commission and Natural England.

4.8.4 The principles for habitat creation and translocation are set out in the document 'Ecological principles of mitigation for HS2 LWM', which is part of the Environmental Statement.

4.8.5 The nominated undertaker will maintain or make provision to maintain and monitor any new or managed habitat, for a sufficient period to ensure that the objectives of the proposals for nature conservation and protection of the historic environment are achieved. The details for specific locations will be identified by the nominated undertaker.

4.8.6 Monitoring of the ecology mitigation and compensation measures is necessary to measure the extent to which the ecological objectives of the proposals are being met. The approach to monitoring will vary depending upon which management option is adopted for a particular area of habitat and will be agreed on a site-specific basis. Broad generic indications of the likely durations of monitoring, maintenance and management during the establishment period for those habitats affected by the project are set out in HS2 Information Paper *E26: Indicative Periods for the Management and Monitoring of Habitats*.

4.8.7 Subject to any relevant approvals or agreements required for any restoration or mitigation schemes under Schedule 17 to the Act, land which is used temporarily in

connection with the project will be considered for restoration as part of HS2 Ltd's overall approach to seek no net loss to biodiversity.

- 4.8.8 The Secretary of State will require the nominated undertaker to form an Ecology Review Group for the specific purpose of reviewing the outputs from the ecology monitoring programme. The Ecology Review Group will receive reports on an annual basis and will be asked to make recommendations for remedial measures to the nominated undertaker where progress against objectives is considered insufficient. The composition of this group will include Natural England, the Forestry Commission, local authority representation, appropriate nature conservation NGOs and relevant specialists as necessary.
- 4.8.9 Measures will be put in place to ensure that, in cases where the ecological objectives are not being realised, this can be dealt with in an appropriate manner.

4.9 Geological features

- 4.9.1 Should a geological deposit or feature of high scientific value be discovered, the nominated undertaker will carry out appropriate recording and, if reasonably practicable, protection of such deposits. Where such deposits cannot be protected, and it is practicable to do so, the material may be removed for study and preservation.
- 4.9.2 Should unexpected contamination be revealed during the course of the works, a plan will be put in place by the nominated undertaker to manage this.

4.10 Water resources and flood risk

- 4.10.1 Where reasonably practicable, material interference with surface and groundwater bodies and existing hydrological patterns of catchments, including groundwater flows to aquatic habitats, will be avoided. Consultation shall allow for the Environment Agency to have reference to their wider environmental and recreational duties. Where appropriate to their role, consultation with Lead Local Flood Authorities and Internal Drainage Boards will also be undertaken. Where surface and groundwater bodies or existing hydrological patterns must be interfered with, so far as is reasonably practicable:
- such works will be undertaken so as to control adverse effects on ecological and landscape receptors;
 - continuity of surface and groundwater flows and quality will be maintained to mitigate environmental impacts, by means of watercourse diversions, sustainable drainage systems (SuDS), creation of natural banks and features and, where unavoidable, culverts;
 - mitigation for ecological impacts will be provided for and consideration will also be given to enhancing nature conservation benefits resulting from drainage works;

- mitigation for loss of flood storage capacity will be provided by creating replacement floodplain storage areas, taking climate change allowances into account.

- 4.10.2 Paragraph 4.10.1 shall apply equally to ensure compliance with the Water Framework Directive objectives.
- 4.10.3 SuDS will be implemented in preference to other forms of drainage, where it is reasonably practicable to do so, and in accordance with the necessary approvals.
- 4.10.4 The nominated undertaker will include appropriate measures to ensure the protection of controlled waters, including both surface water and groundwater bodies from pollution.
- 4.10.5 Monitoring will be undertaken in consultation with the Environment Agency and/or Natural England prior to and during construction, and if required post construction, to establish baseline conditions for surface water and groundwater and to confirm the effectiveness of temporary and permanent mitigation measures together with any remedial works deemed necessary.
- 4.10.6 Maintenance access will be provided to water-related infrastructure, to enable inspections and maintenance to be regularly carried out.
- 4.10.7 The Heritage Memorandum requires a programme of historic environment investigation, recording and mitigation. Where a watercourse or the banks of a watercourse are affected by any historic environment works, the nominated undertaker will consult the Environment Agency and, where relevant, Lead Local Flood Authorities, Internal Drainage Boards, Natural England and/or the Canal & River Trust, on the location specific written scheme of investigation.

4.11 Agricultural and forestry land

- 4.11.1 Former agricultural land not required for the railway or its mitigation will, where practicable, be restored to agricultural use after completion of HS2 construction.
- 4.11.2 Topsoil (and subsoil where appropriate) will be stripped from land prior to construction and stored appropriately. The intention is to reinstate agricultural land to its former quality, with reference to Defra's Agricultural Land Classification system, where reasonably practicable.
- 4.11.3 It should be noted that whereas soils from woodland areas will also be conserved for beneficial use within Phase One of HS2, the nominated undertaker is not committed to the reinstatement of all woodland and forestry areas affected by Phase One of HS2 *in situ*, but other areas will be used for habitat creation and hence the overall area of woodland and forests will not be reduced.
- 4.11.4 In some circumstances, the surface of land to be returned to agriculture will be graded such that it fits in with the new landforms created by Phase One of HS2, prior to being reinstated to its former condition where practicable. Surface gradients on new landforms will be limited to ensure that former best and most versatile land is not downgraded where reasonably practicable.
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- 4.11.5 The nominated undertaker will apply a soil handling method statement (covering soil stripping, storage and reinstatement), which will be based on a soil resources survey carried out as part of the environmental assessment. In carrying out soil handling operations for the conservation of the soil resource, including the translocation of ancient woodland soils, the nominated undertaker will apply the good practice guidance and other more general prescriptions set out in the CoCP and the LEMPs, and as described in HS2 Information Paper E33: *Soil Handling for Land Restoration*.
- 4.11.6 To ensure that the objectives of the above works are achieved, the nominated undertaker will, where appropriate, manage or support the recovery of reinstated agricultural land during an appropriate aftercare period.

4.12 Excavated material

- 4.12.1 The nominated undertaker will utilise excavated materials in the construction of Phase One of HS2 where feasible and reasonably practicable, in accordance with the Contaminated Land: Applications in Real Environments (CL: AIRE)¹ definition of Waste: Development Industry Code of Practice.
- 4.12.2 Where it is not feasible or reasonably practicable to use excavated materials in the construction the nominated undertaker will minimise the quantity of excavated materials that are disposed of to landfill. This may include providing surplus materials for use in other construction projects including environmental improvement projects.
- 4.12.3 Where the off-site transport of surplus excavated material would result in significant environmental effects sustainable placement may be used. Where sustainable placement is to be undertaken this will be permitted in line with the Environmental Permitting Regulations (England and Wales) 2016 and approval may be required in accordance with Schedule 17 Planning Conditions Schedule of the HS2 High Speed Rail (London - West Midlands) Act 2017.

4.13 Waste management

- 4.13.1 All waste generated from the design, construction and operation of Phase One of HS2 will be managed in accordance with the waste hierarchy as described in the Government Review of Waste Policy in England 2011².
- 4.13.2 The waste hierarchy sets out the preferred approach to the management of waste from waste prevention, to reuse, recycling, energy recovery and landfill. It supports the need to achieve efficient use of material resources, minimise the amount of waste produced (or otherwise increase its value as a resource) and reduce, as far as possible, the amount of waste that is disposed to landfill, in keeping with the HS2 Sustainability Policy. More information is available in Information Paper E3: *Excavated material and waste management*.

¹ CL:AIRE is the UK's independent body promoting sustainable remediation of contaminated land and groundwater. CL:AIRE was created with the backing of the UK government in 1999 as a not-for-profit company to encourage the demonstration and research of practical solutions for the clean-up of contaminated land, and to provide a sustainable alternative to disposing of waste in landfill sites.

² Defra (2011), Government Review of Waste Policy in England 2011. London, HMSO.

4.14 Climate change

- 4.14.1 All work shall be carried out in accordance with principles as set out in the HS2 Information papers *Eg: Climate Change Adaptation and Resilience* and *E10: Carbon Minimisation*. In addition, the nominated undertaker will require each of its lead contractors to produce carbon management plans and pay due consideration to the impacts of extreme weather events and related conditions during construction.

5 Key environmentally sensitive worksites

- 5.1.1 Table 5.1 identifies key worksites along the Phase One route that are particularly environmentally sensitive in terms of nature conservation, terrestrial and aquatic ecology, water resources, geomorphology, recreation and amenity, landscape, public open space and agricultural land. In this context, 'environmentally sensitive' does not refer to all sites where there are significant environmental effects as reported in the Environmental Statement.
- 5.1.2 As agreed with NEF members, in relation to the environmental topics identified in paragraph 5.1.1, the criteria for inclusion in Table 5.1 are as follows:
- in-combination sensitivities;
 - sensitivities of particular severity; and
 - where multiple consenting processes will apply.
- 5.1.3 For the purposes of identifying environmentally sensitive worksites, landscape sensitivity is where the predominant impact is on open space, as the process for mitigation of townscape and related visual impacts is developed through Schedule 17 to the Act and the Planning Memorandum as set out in HS2 Information Paper *D1: Design Policy* (section 3).
- 5.1.4 The CoCP requires the nominated undertaker to prepare a number of LEMPs setting out the specific control measures necessary to deliver the requirements it sets out. As part of the LEMPs, this Memorandum requires the nominated undertaker to prepare site-specific management plans for the key environmentally sensitive worksites identified in Table 5.1, focusing on mitigation, compensation and monitoring requirements and opportunities for enhancement in relation to identified environmental topics as outlined in 5.1.1. Individual LEMPs will be produced for each relevant local authority area (i.e. district council, London borough or other unitary authority).
- 5.1.5 Table 5.1 also indicates key statutory consultees who, along with relevant local authorities, will also be consulted on the LEMP for these key environmentally sensitive worksites. It is intended that these environmental site-specific management plans will be submitted for information with relevant Schedule 17 and, where appropriate, heritage applications, recognising that the grounds for consideration of Schedule 17 applications are those set out in the Act.

If, during further design, the nominated undertaker is able to completely avoid the use of a specific environmentally sensitive worksite, then the nominated undertaker will report to the relevant members of the National Environment Forum and the relevant local authority that the specific key environmentally sensitive worksite will not feature in the respective LEMP.

Table 5.1

Purpose	<p>The LEMPs describe the locally relevant generic measures from the CoCP. As part of the LEMPs the Environmental Memorandum requires the NU to prepare site specific management plans for 'Key Environmentally Sensitive Worksites' focusing on mitigation, compensation, and monitoring requirements and opportunities for enhancement in relation to identified environmental topics- nature conservation, terrestrial and aquatic ecology, water resources, geomorphology, recreation and amenity, landscape, public open space and agricultural land. NEF members along with relevant planning authorities will also be consulted on the LEMP for these key environmentally sensitive worksites in accordance with the CoCP.</p>						
Area	Landscape	Recreation, amenity and public open space	Nature conservation, terrestrial and aquatic ecology	Water resources and flood risk	Agricultural land	Reason for inclusion - Key environmental sensitivities	Other controls/processes applicable to all sites
Colne Valley	*	*	*	*		1) Recreation 2) Nature conservation, terrestrial and aquatic ecology 3) Water resources and flood risk 4) Landscape	1) Ecology Site Management Plans 2) Schedule 17 controls 3) Design policy 4) Protective Provisions 5) Consenting procedure 6) EMS produced by lead contractors (as defined in the CoCP)
Chilterns AONB	*	*	*	*	*	1) Landscape 2) Nature conservation, terrestrial and aquatic ecology 3) Recreation 4) Water resources and Flood risk 5) Agricultural land	
Berkswell Marsh			*	*		1) Nature conservation, terrestrial and aquatic ecology 2) Water resources and flood risk	
Bernwood Forest	*		*			1) International asset of importance [Bechstein's bats] 2) Landscape	
Radstone and Helmdon disused railway			*			1) Severity of sensitivity	

High Speed Two (HS2) Limited,
Two Snowhill
Snow Hill Queensway
Birmingham B4 6GA

www.gov.uk/hs2