

Local Environmental Management Plan – Solihull Metropolitan Borough Council

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1 Introduction

1.1 Purpose

1.1.1 This Local Environmental Management plan (LEMP) sets out site specific control measures to be adopted by HS2 Contractors working within the Solihull Metropolitan Borough Council (SMBC) . This LEMP builds upon but does not repeat the HS2 general environmental requirements set out in the Code of Construction Practice (CoCP) (available online at:

> https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attach ment_data/file/593592/Code_of_Construction_Practice.pdf).

- 1.1.2 This LEMP contains control measures and standards to be implemented within SMBC area throughout. The sections within this LEMP should not be read in isolation from other sections due to the interconnected nature of the measures between disciplines.
- 1.1.3 For ease of reference the LEMP mirrors the topic headings in the CoCP.
- 1.1.4 Information of relevance to the formation and development of this LEMP (as shown in figure 1) is contained within this document, or links are provided to where it can be accessed. This includes:
 - Information from traffic, environmental surveys and ground investigation works. This could either be seasonal ecological surveys, tree surveys, noise monitoring, ground settlement or the results of ground investigations detailing levels of contamination (where present) and the nature of the ground;
 - Feedback on pertinent information from on-going engagement; and
 - Results of petitions of the parliamentary process which have resulted in amendments to the mitigation measures contained within the CoCP.



Figure 1: Key workstreams that will provide additional information for the LEMP.

- 1.1.5 This LEMP has been prepared taking into account findings of the Environmental Statement (ES) hereafter referred to as the Main ES, Additional Provision (AP) ES, Supplementary Environment Statement (SES) and AP2 ES, SES3 and AP4 ES and SES4 and AP5 ES documents where relevant. It has evolved during the Parliamentary process and engagement with the Local Authority and other stakeholders, such as members of the National Environment Forum¹, which have informed its development. This LEMP may be subject to further refinement, amendment and expansion as necessary as the project design progresses.
- 1.1.6 The Contractors will implement the requirements of the LEMPs and the CoCP through their own Environmental Management System (EMS), which is certified to BS EN ISO 14001.
- 1.1.7 The Nominated Undertaker (HS2 Ltd)² and/or its Contractors will continue to engage with the local stakeholders. This will take the form of engagement events which will be carried out to introduce and brief the communities on local environmental information, management and mitigation as detailed within this document.

¹ The National Environment Forum comprises Government departments and statutory bodies and was established to advise on environmental policy for HS2, including project wide strategies for reducing the environmental impact of the line and principles for a Code of Construction Practice.

² HS2 Ltd is the Nominated Undertaker. The two terms are used interchangeable throughout the LEMP.

- 1.1.8 The controls within this LEMP, as with those in the CoCP, are in line with HS2's Safe at Heart health and safety brand. Safe at Heart seeks to ensure that health and safety are at the heart of everything that we do including in the design, construction and operation of the scheme. This aim stretches beyond the scheme itself, through instruments such as this LEMP, and into the communities along the scheme to ensure that we protect their health, safety and wellbeing.
- 1.1.9 The HS2 Environmental Memorandum identifies key worksites along the route of HS2 Phase One that are environmentally sensitive in terms of nature conservation, terrestrial and aquatic ecology, water resources, geomorphology, recreation and amenity, landscape, public open space and agricultural land. The criteria for inclusion are 'worksites where a key significant impact (that has been agreed with the HS2 National Environment Forum members) is generated in any of the environmental topics as mentioned above. There is one site identified in SMBC, this being Berkswell Marsh SSSI. The Key Environmental Site-Specific Work Management Plan for this site will be presented within Appendix D.
- 1.1.10 HS2 documents referenced within this LEMP can be found on the <u>www.gov.uk</u> website.

1.2 Area and Scope

An overview map for SMBC and this LEMP is shown in figure 2 below. Plans showing more details of the scheme, as revised in AP3 and covered by this LEMP, are presented in the Environmental Statement (ES) maps (CFA1 to CFA3 Volume 2 Map Books ES Ref 3.2.2.1, 3.2.2.2 and 3.2.2.3), CT-05-001 to CT-06-001.





- 1.2.1 It is anticipated that the following general descriptions of work activities will continue to take place during core and non-core working hours during the construction period within SMBC:
 - Advance works, including site investigations, ground investigations and associated environmental surveys and surveys further to those already undertaken;
 - Enabling works, including utilities works in the wider area; highway and public right of way (PRoW) diversions; building demolitions; site clearance, habitat removal, creation and environmental mitigation measures;
 - Translocation of animal species, archaeological investigations, vegetation clearance and fencing of the route, creation and environmental mitigation measures;

- Civil engineering works including those associated with the station: establishment of construction compounds, site preparation, main earthworks and structure works, building works and fit out, retaining structures and erection of bridges/viaducts, subsurface tunnelling and excavations, site restoration and removal of construction compounds;
- Works to conventional railway track, signalling and other railway systems;
- High speed railway installation works and systems fit out, including establishment of construction compounds, infrastructure installation, traction power supplies, overhead line equipment and communications features, connections to utilities, removal of construction compounds; and
- Works to highways, including:
 - Road widening to A452 (Chester Road)/A446 (Stonebridge Road);
 - Improvement to carriageway layout at Stonebridge island;
 - Improvement works to road layout at Birmingham Business Park and B4438 (Bickenhill Lane);
 - Construction of new overbridge structures over M42 and A446;
 - New culverts for Hollywell brook beneath A452 (Chester Road);
 - Construction of new roundabout which feeds station access points;
 - Construction of a new roundabout at the junction of the A452 (Kenilworth Road) and Park Lane
- Automated people mover (APM works including a viaduct over the M42 and Pendigo Lake, construction of APM stops and maintenance facility; carriageway, airport and rail crossing works); and
- System testing and commissioning.
- 1.2.2 On 16 November 2016 contracts were awarded for three Enabling Works Contractors (EWC) working on behalf of HS2 Ltd across Phase One of the project. The EWC covering the SMBC area was the LM Joint Venture, a joint venture between Laing O'Rourke and J. Murphy & Sons.
- 1.2.3 At the end of 2020, contracts were awarded for HS2's Main Works Civils Contractors (MWCC). The MWCC for the SMBC area is Balfour Beatty Vinci (BBV). BBV is a joint venture made of Balfour Beatty Group Ltd, VINCI Construction Grands Projects, VINCI Construction UK Ltd, VINCI Construction Geoinfrastructure.
- 1.2.4 The Interchange Station design will be designed by SDSC (Station Design Service Contractors), namely ARUP and it will be constructed by MWSC (Main Works Station Contractors) – Laing O'Rourke Delivery Limited.

- 1.2.5 The MWCC commenced site establishment in the first half of 2021 for construction starting from mid 2021:
 - Construction of the Kenilworth Greenway Diversion.
 - Construction of the Burton Green Retaining Structure, which also includes the construction of two overbridges to reinstate the footpath and Waste Lane. Demolition of an existing footbridge.
 - Waste Lane overbridge, an existing bridge, is to be demolished and a new overbridge will be constructed.
 - Waste Lane and Beechwood embankment, two culverts will be constructed and two underpasses. Erection of embankments. Installation of concrete structures to enable quicker reinstatement of footpaths.
 - Construction of Carol Green underpass, which will include installation of piles, pilecaps and walls.
 - Temporary balancing ponds and ditches will be constructed to control water run off.
 - Construction of a haul road from the Park Lane compound which will cross the existing highway network and watercourses.
 - A permanent diversion to the A452 and A446 will be constructed.
 - Construction of the HS2 rail alignment will take place. This will include the construction of under and over bridges.

2 Purpose of the Local Environmental Management Plan

- 2.1.1 This LEMP focuses on the area specific control measures by topic as relevant to construction works within the SMBC area. The measures described will be applied by the Nominated Undertaker and its Contractors throughout the construction period to reduce the potential environmental and community impacts within the SMBC area during construction.
- 2.1.2 The Nominated Undertaker's Contractors will develop detailed environmental site management mitigation through their EMS, taking into account this LEMP and the Environmental Minimum Requirements (EMRs).

3 Policy and Environmental Management Principles

3.1.1 Information relating to the HS2 Ltd sustainability policy and environmental management principles is provided in Section 3 of the CoCP.

4 Implementation

4.1.1 Details relating to implementation, such as enforcement and site management measures, are provided in Section 4 of the CoCP.

5 General Requirements

5.1 **Community Relations**

- 5.1.1 General control measures relating to community relations, hours of work, pollution incident control and security etc. Are identified in Section 5 of the CoCP.
- 5.1.2 To reduce the likelihood of an environmental incident or nuisance occurring, measures from Section 5 of the CoCP will be implemented including; effective preventative pest and vermin control and prompt treatment of any pest and vermin infestation, including arrangements for disposing of food waste or other attractive material. If infestation occurs, the Contractor will take action to eliminate the infestation and prevent further occurrence.
- 5.1.3 As detailed within Section 5 of the CoCP, the Nominated Undertaker and its Contractors will implement the Community Engagement Framework. The framework will focus on engagement during construction with the local communities and on the specific needs of protected groups (as defined in the Equalities Act 2010) especially those who may be affected by construction impacts in the immediate vicinity of the works. A range of tools will be used to achieve this that will tailor engagement to local needs.
- 5.1.4 Successful management of the project will involve understanding communities and their needs, actively engaging, listening and responding. The arrangements for this are set out in the HS2 Community Engagement Framework. Liaison with the local community will take place to consistently provide timely, clear tailored information on the construction programme, updates on forthcoming works. It will also provide the opportunity for members of the public to respond, discuss issues and provide feedback that can be acted upon. This information will be included in the local area plan for community engagement.
- 5.1.5 The Local Area Plan will take account both of distinct geographic distribution of the communities within SMBC and will involve the Contractors and any relevant third parties and stakeholders, for which there will be co-ordination arrangements.
- 5.1.6 For the purposes of this LEMP, a third party is an organisation with whom HS2 Ltd has entered into a legal agreement to undertake works on its behalf, to be delivered under the powers of the High-Speed Rail (London West Midlands) Act (the Act), or the third party's own powers (e.g., permitted development). Such agreements require the third parties to comply with the requirements of the Act and the EMRs,

including the CoCP. Third parties relevant to this LEMP include Network Rail, Highways England, the Urban Growth Company (UGC), and utility companies such as Severn Trent Water, National Grid, Cadent and Western Power Distribution.

5.1.7 Ongoing engagement with local interests and community groups will occur during construction, as listed in Appendix B of this LEMP. (NB: This list is indicative and will be subject to change as more information becomes available.)

5.2 Advanced Notice of Works

5.2.1 The Nominated Undertaker and its Contractors are committed to informing communities on matters of interest and relevance. Therefore, they will ensure that stakeholders affected by the proposed construction works, as outlined in the ES, will be informed in advance of works by methods outlined in the community engagement framework and as per Section 5.1.4 of the CoCP.

5.3 Working Hours

5.3.1 The framework for seeking consents from SMBC for working hours under Section 61 of the Control of Pollution Act 1974 is set out in the CoCP.

Core Working Hours

- 5.3.2 Core working hours will be from 08:00 18:00 on weekdays (excluding bank holidays) and 08:00 13:00 on Saturdays. See also HS2 Information Paper D4: Working Hours.
- 5.3.3 A period of up to one hour before and up to one hour after core working hours will be required for start-up and close down activities as detailed within the CoCP. To maximise productivity within the core working hours, the 1hr start up and close down periods will include activities such as deliveries, workforce arrival/departure, unloading, maintenance and general preparation works. During this period, plant and machinery that is likely to cause disturbance to local residents will not be allowed to operate. This period will not be an extension of the core working hours. Working outside of these hours would need to be agreed through the Section 61 consenting process with SMBC.
- 5.3.4 Please note that emergencies (not repairs and maintenance) may be undertaken outside core hours.

- 5.3.5 Certain work activities at specific locations within the SMBC area will need to take place outside of the core working hours for safety and engineering purposes and to comply with Undertaking and Assurance (U&A) requirements and traffic management. These work activities (which may include construction associated with station, infrastructure works and rail works, including possessions) will be covered by the Section 61 process and are likely to include:
 - Carol Green Rail underbridge most of the work will be undertaken during core working hours, however there may be a number of activities where this is not possible due to the interface with the operation of the Rugby to Birmingham rail line and these will be undertaken outside of the core hours;
 - A45 Coventry Road and associated service roads most of the works will be undertaken during core working hours with some adjacent and tie-in works to the existing carriageway taking place outside of core working hours;
 - M42 junction 6: the majority of works to the will be undertaken during core working hours, with some night and weekend working;
 - Automated people mover (APM) works: the majority of the works will be undertaken during core working hours with some adjacent and tie-in works to the existing carriageway, airport and rail crossing works taking place outside of core working hours;
 - Deliveries of large components, such as bridge beams, heavy plant and equipment; and
 - Setting up temporary vehicle and pedestrian diversions.
- 5.3.6 It is currently envisaged that a number of railway possessions (to be carried out during non-core hours) will be required for the following:
 - Carol Green Rail Underbridge;
 - Automated People Mover crossing Rugby to Birmingham Line; and
 - Automated People Mover works at Birmingham International Station.
- 5.3.7 To limit the number of possessions that will be undertaken, a protective barrier will be installed where practicable between the existing railway and HS2 sites to maximise the works to be carried out during core working hours, where stipulated clearance can be met, in accordance with the Section 61 processes.
- 5.3.8 In circumstances where this is not practicable, the work will typically be carried out during possessions either during midweek nights or extended weekend nights. Every effort will be made to reduce work outside of core hours so as to avoid excessive community disturbance.

5.3.9 Road Rail Vehicles (RRVs)³ will generally be delivered and operated outside of normal working hours for works associated with the existing railway. Material delivery and removal for these works interfacing with conventional rail will be carried out during the same periods.

5.4 **Construction Site Layout and Good Housekeeping**

5.4.1 The measures set out in Section 5.3 of the CoCP will be used to reduce the likelihood of an environmental incident or nuisance occurring.

5.5 Site Lighting

- 5.5.1 All construction sites will be lit in accordance with the requirements of the CoCP (as detailed within Section 5.4 of that document) and approval of site lighting in Schedule 17 Part 1 of the Act.
- 5.5.2 Where reasonably practicable, site lighting will be designed to avoid light pollution to surrounding buildings, ecological receptors, structures used by protected species, local residents, railway operations, passing motorists and other sensitive land uses, where reasonably practicable.

5.6 Worksite Security

- 5.6.1 The intention is to achieve safe and secure worksites, with balanced and appropriate security measures that are commensurate with the risk, as detailed within Section
 5.5 of the CoCP.
- 5.6.2 A security plan will be required for each site and where appropriate, security fencing and gates provided to perimeters of construction locations and site compounds. Fence type and construction will be appropriate to the level of security required and depend upon the likelihood of intruders, level of danger and visual impact to the environment.
- 5.6.3 Contractors will be responsible for ensuring that the site/working areas and plant and materials are secure from use by unauthorised persons at all times. Plant machinery will be securely locked away and immobilised each night. Securing sites

³ Road Rail Vehicles (RRVs) will generally be delivered and operated outside of normal working hours for works associated with the existing railway. Material delivery and removal for these works interfacing with conventional rail will be carried out during the same periods.

will involve the use of physical, electronic and human resources in a proportionate and cost-effective manner.

- 5.6.4 In some situations, particularly in an urban setting, consideration will be given to extra visibility for the public and workforce at night, e.g. use of half-timber/half-infill (i.e. perspex) at hoarding corners together with convex mirror to prevent blind spots. All sites will have security lighting to ensure the safety of passing pedestrians and other traffic. Details can be found in Information Paper D10: Worksite Security.
- 5.6.5 Security provisions will be deployed at all HS2 sites and working areas on a 24/7 basis this may include CCTV cameras, alarms and security personnel. This approach will help protect assets with measures that deter, delay and detect intrusion.

5.7 Hoarding, Fencing and Screening

- 5.7.1 The site perimeter will generally be fenced with 2.4m high solid hoardings that will be appropriately decorated, in line with measures described within Section 5.6.1 of the CoCP, if appropriate.
- 5.7.2 Hoardings up to 3.6m high may, on occasions, be used to control construction noise. At locations where existing fencing may need to be removed suitable alternatives will be used. Any specific alteration or heights will be due to site specific requirements and nearby receptors.
- 5.7.3 Opportunities to include temporary landscaping measures including but not limited to green hoardings, ivy screens, artificial ivy and instant hedging will be considered and where reasonably practicable implemented where there are clear benefits to local air quality, biodiversity and visual appearance of the area, taking into account costs, longevity and ease of maintenance.
- 5.7.4 Where there are earthworks along the line of route, such as cuttings and embankments, temporary fencing will be erected along the site boundaries. The type of fence will be dependent upon the nature of use of the adjacent land, as well as environmental, design, and safety considerations. Details can be found in Information Paper D10: Worksite Security.

5.8 Unexploded Ordinance

5.8.1 A risk assessment for the possibility of unexploded ordnance being found within construction areas will be carried out, as detailed within Section 5.7 of the CoCP.

5.9 Electromagnetic Interference

5.9.1 The impacts of electromagnetic interference during design and construction will be undertaken, as detailed within Section 5.8 of the CoCP

5.10 Temporary Living Accommodation

- 5.10.1 No on-site temporary workers living accommodation is proposed for the Main Works.
- 5.10.2 The provision of on-site workers' temporary living accommodation will be considered and approved in advance by the local authority, as detailed within Section 5.9 of the CoCP.

5.11 Occupational Healthcare

5.11.1 The Nominated Undertaker will ensure that there is provision for access to either onsite or near-site occupational healthcare for site workers, as detailed within Section 5.10 of the CoCP.

5.12 Clearance and Re-instatement of Sites on Completion

5.12.1 This will be carried out as detailed within Section 5.11 of the CoCP. On completion of construction works, plant, materials, equipment, temporary buildings and vehicles not required during subsequent activities will be removed from the site. All reinstatement will be completed in accordance with the requirements of the Act.

5.13 Pollution Incident Control and Emergency Preparedness

- 5.13.1 The Contractor's pollution incident control and emergency preparedness plan(s) will need to have due regard to local receptors as detailed in Sections 6 to 16 of this LEMP.
- 5.13.2 The plan will also consider measures and processes to be implemented in the event of environmental non-conformances.

5.14 Local Control Measures

5.14.1 The Contractor's pollution incident control and emergency preparedness plan(s) will include the following pollution prevention and control mechanisms:

- Static plant will be used with secondary containment measures, such as plant nappies, to retain any leakage of fuel or oil to reduce the risk of pollution;
- Spill kits will be provided where appropriate to reduce the risk of pollution;
- The use of oil interceptors at site offices and work compounds;
- Appropriate measures such as use of bunds of non-erodible material or silt or sediment fences will be used adjacent to watercourses, such as the River Blythe, Bayleys Brook, River Blythe Bypass channel, Shadow Brook, Hollywell Brook, and the unnamed tributary running adjacent to Denbigh Spinney;
- Implementing a surface water or groundwater monitoring plan, particularly in relation to works which may affect aquifers, for example, excavations and piling; and
- Work that might have an impact on groundwater quality will need formal approval by the EA via Schedule 33 Part 5 in the Act.

5.15 Fire Prevention and Control

5.15.1 The Contractors will ensure all construction sites and associated accommodation and welfare facilities will have in place appropriate plans and management controls to prevent fires. See also section 5.13 of the CoCP.

5.16 Extreme Weather Events

5.16.1 The Contractors' pollution incident control and emergency preparedness systems will need to have due regard to the potential of extreme weather events and key receptors and take into account any proposed risk management or mitigation measures. See also Section 5.14 of the CoCP. Where necessary, the statutory bodies will be consulted with regards to emergency planning.

5.17 Carbon Management Plans

5.17.1 The Contractor will produce carbon management plans, in accordance with the HS2 Carbon Minimisation Policy as detailed within Section 5.15 of the CoCP.

5.18 Interface Management Between Adjacent Construction

Areas

5.18.1 The Nominated Undertaker will oversee the interface between the Contractors as detailed within Section 5.16 of the CoCP, which may be within the same or adjacent local authority boundaries.

6 Agriculture, Forestry and Soils

6.1 General

6.1.1 General control measures relating to agriculture, forestry and soils are provided in Section 6 of the CoCP.

6.2 Sensitive Receptors

- 6.2.1 Approximately 416ha of agricultural land will lie within the construction boundary in the SMBC area. Approximately 69% of this land is of the best and most versatile quality in Grades 2 and 3a and the remaining 31% is moderate quality land in Subgrade 3b.
- 6.2.2 Approximately 172ha will be required permanently for the scheme, with approximately 244ha restored to agriculture.
- 6.2.3 High-quality soils that will be permanently displaced and reused in the design of the scheme for agriculture and other uses represent a sensitive receptor.
- 6.2.4 Some land uses situated adjacent to the construction boundary may be considered sensitive receptors, particularly in respect of farm infrastructure and crops. This includes interruptions to drainage systems, livestock water supplies and irrigation systems; the potential for dust deposition on crops, particularly field vegetables; interruptions to farm and field accesses; and the maintenance of appropriate stock-proof fencing. This also applies to approximately 243ha of land within the construction boundary in the SMBC area that is to be restored to agriculture.

6.3 Local control measures

6.3.1 Where topsoil and subsoil will be stripped across the site, a Soil Resources Plan (SRP) will be prepared. The SRP will establish the type and volume of the topsoil and subsoil to be stripped, the designated location of the stockpiles and the proposed use of conserved soils for land restoration. There is a commitment in the main ES for the reuse of soils on the scheme.

- 6.3.2 In areas where compounds are to be created, it is envisaged that each area will be stripped of topsoil in accordance with the SRP. Temporary material stockpiles will be clearly recorded, and the topsoil will be reinstated.
- 6.3.3 In respect of storage areas for soil and excavated materials, and within the wider construction site, the presence and spread of invasive, non-native species (plants and animals) and noxious weeds will be controlled through the adoption of appropriate management regimes. These will identify and effectively treat areas that could also threaten adjoining agricultural areas.
- 6.3.4 Appropriate construction, handling, treatment, and disposal procedures will be implemented in relation to invasive species and noxious weeds. Route-wide measures will also be implemented to promote biosecurity and minimise the risk that invasive non-native species and diseases are spread as a consequence of the scheme. Further details are provided in the CoCP sections 9.2.7 9.2.11.
- 6.3.5 Measures for the protection of farm infrastructure and crops will be subject to liaison with landowners, occupiers and land agents.
- 6.3.6 Following consultation with individual farmers, arrangements made with the farmers are documented in Farmers and Growers' packs. Details on the scope of these packs is included in the HS2 Guide for Farmers and Growers.

7 Air Quality

7.1 General

- 7.1.1 General control measures relating to air quality are provided in Section 7 of the CoCP.
- 7.1.2 Contractors will be required to manage dust, air pollution, odour and exhaust emissions during the construction works in accordance with Best Practicable Means (BPM) and refer to current publications on 'best practice⁴'.

7.2 Sensitive receptors

- 7.2.1 The Contractor's working methods will have due regard to local sensitive receptors where there may be impacts due to dust emissions from construction works and exhaust emissions of air pollutants from construction traffic vehicles travelling to and from construction areas.
- 7.2.2 For air quality, relevant sensitive receptors include locations where there are residential properties, other types of property where there is human exposure over extended periods, for example hospitals and schools, and locations where there are designated ecological sites with sensitive vegetation. The potential impacts have been considered in terms of dust soiling on people and property; human health effects of dust and air pollutant emissions; and effects of dust deposition on vegetation.
- 7.2.3 Air quality construction assessment locations and the impacts to relevant receptors are identified in the main ES (Volume 2: CFA 18-19 and CFA 23-25 Reports, Chapter 4 Air quality and the Volume 5: Appendices AQ-001-018, AQ-001-019, AQ-001-023, AQ-001-024 and AQ-001-025), SES and AP2 ES (SES and AP2 ES Volume 2: CFA 18-19 and 23-25), and SES3 and AP4 ES (SES3 and AP4 ES Volume 2: CFA 18-19 and CFA23-25).
- 7.2.4 The receptors considered most sensitive are those located within 20m of construction works and/or routes used by construction vehicles; these are specifically referred to in this LEMP. In the SMBC area, these receptors are mainly residential properties but also include ecological receptors:

⁴ Guidance on the assessment of dust from construction and demolition, Institute of Air Quality Management, February 2014. Air Quality Monitoring in the Vicinity of Demolition and Construction Sites IAQM, November 2012. The Control of Dust and Emissions during Demolition and Construction GLA Supplementary Planning Guidance Document, July 2014.

- B4101 Waste Lane;
- Balsall Common;
- Truggist Lane;
- Marsh Lane;
- Lavender Hall Farm;
- Lavender Hall Lane;
- Top Lodge and Final Home;
- Park Lane;
- Berkswell Marsh SSSI;
- Denbigh Spinney LWS;
- Patrick Farm, Meriden Road;
- Pasture Farm, south of A45 Coventry Road;
- Old Station Road;
- Middle Bickenhill Lane;
- Park Farm and Common Farm;
- A452 Chester Road; and
- Yorkminster Drive and Chelmsley Wood.
- 7.2.5 Receptors potentially affected by emissions from anticipated construction traffic are mainly along the B4101 Waste Lane, A45 Coventry Road, M42 junction 6, A452 Kenilworth Road, Park Lane, A452 Chester Road, Middle Bickenhill Lane, and Coleshill Heath Road.
- 7.2.6 The Institute of Air Quality Management (IAQM) methodology⁵ for assessment of dust from demolition and construction has been used to classify the risk of dust impacts as 'low', 'medium' and 'high' risk at the locations of relevant sensitive receptors. The locations to be explicitly considered in the Contractor's working methods were assessed to have a low to high risk of dust impacts without mitigation measures.

7.3 Local Control Measures

7.3.1 All the relevant methods outlined within the CoCP will be applied to control and manage potential air quality effects. These methods are considered to be sufficiently effective within areas in and around those listed in Section 7.2. Best Practicable Means of dust control will be implemented on sites in line with the HS2 Code of Construction Practice and will include, where appropriate, planning the site layout; provision of dust suppression measures in all areas of the construction sites that are likely to generate dust; measures to keep roads, accesses, and vehicles clean; and

⁵ Institute of Air Quality Management (2011) Guidance on the assessment of the impacts of construction on air quality and the determination of the local control measures.

the enclosure, shielding or provision of filters on plant likely to generate excessive quantities of dust beyond the site boundaries. Specific measures for each site should be developed with regard to the particular activity being undertaken in proximity to sensitive receptors.

- 7.3.2 Dust suppression measures and works screening will be subject to approval in accordance with Schedule 17 of the Act. Further measures are detailed within Section 7 of the CoCP.
- 7.3.3 HS2 has set emission requirements and targets for the engines of Contractor cars, vans, and heavy road vehicles. These have been developed for the whole route and are categorised as follows: London Low Emission Zone, Clean Air Zone and Rest of Route. For SMBC the relevant category of vehicle emission standard is the Rest of Route. There are requirements for heavy road vehicles to be powered by EURO VI (or lower) engines and for cars and vans to be Euro 6 diesel and Euro 4 petrol from 2020⁶. There are also targets for the use of Ultra Low Emission Vehicles.
- 7.3.4 HS2 has also set requirements for Non-Road Mobile Machinery (NRMM) (i.e., stationary plant and off-road vehicles). These have been developed for the whole route and are categorised as follows: Central Activity Zone, Rest of Greater London and Rest of Country. For SMBC the relevant category of NRMM emission standard is the Rest of Country within which the requirement is for NRMM to be powered by Euro stage IIIB⁷ from 2017 and from EU stage IV from 2020⁸. The HS2 Information Paper E31: Air Quality gives further information on the HS2 emission standards.

7.4 Monitoring Procedures

- 7.4.1 An inspection and monitoring programme will be implemented by the Contractor to assess the effectiveness of the control measures as outlined in section 7.3 of the CoCP. Where the results of the dust risk assessments find that there is a medium or high risk of dust impact, continuous dust monitoring is required in accordance with the CoCP section 7.3.
- 7.4.2 In SMBC, the monitoring procedures may include continuous automatic monitoring of airborne dust, including setting a relevant site action level for dust (defined as a dust measurement threshold above which investigation will be required). The

⁶ Euro standards for heavy vehicles are given in terms of roman numerals. Euro standards for light vehicles are given in terms of numerical values and different Euro standards apply for petrol and diesel vehicles.

⁷ IIIA for constant speed engines of any power as there is no corresponding stage IIIB or IV at EU level.

⁸ Roman numerals are also used within the NRMM EU regulations but are not directly comparable to the road vehicle Euro standards.

monitoring being undertaken by HS2 supplements existing air quality monitoring which is part of national and local authority surveys. The monitoring programme, including locations for dust monitoring is in the process of being agreed. Monthly reports of monitoring data from HS2 air quality surveys will be made publicly available throughout construction on the following website: Monitoring the environmental effects of HS2 - GOV.UK (www.gov.uk).

7.4.3 The HS2 Air Quality Strategy gives further information on monitoring, including the process to determine where monitoring would be required and the monitoring methods to be used. This document is available on the following website: https://www.gov.uk/government/publications/hs2-air-quality-strategy.

8 Cultural Heritage

8.1 General

- 8.1.1 General control measures relating to cultural heritage are provided in Section 8 of the CoCP. Further control measures for cultural heritage are provided in the Hs2 Phase One Heritage Memorandum within the Environmental Minimum Requirements and the specific documents identified therein.
- 8.1.2 A route-wide Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI: HERDS) has been prepared which sets out the general principles for design, evaluation, mitigation, analysis, reporting and archive deposition to be adopted for the design development and construction of the scheme.
- 8.1.3 Works associated with the scheme will impact both designated and non-designated assets in SMBC. Full details of the works to be undertaken (i.e., archaeological investigations and built heritage recording) will be determined during the detailed design and will be set out in Project Plans and Location-Specific Written Scheme of Investigations (LS-WSI).
- 8.1.4 Schedule 18 and Schedule 19 to the Act concern how legislation in respect of listed buildings and scheduled monuments respectively apply to the Phase One works.

8.2 Sensitive Receptors

- 8.2.1 Details of all designated and non-designated heritage assets within 500m of the land required, temporarily or permanently, for the construction of the scheme are listed in Volume 5 of the ES and relevant SES and AP amendments (Appendices CH-002-018 to CH-002-019 and CH-002-023 to CH-002-025 and Map series CH-02).
- 8.2.2 Contractors will have due regard for the following designated heritage assets:
 - Grade II* listed Park Farmhouse;
 - Grade II listed Jerrings Hall Farm;
 - Grade II Lavender Hall Farmhouse;
 - Grade II Barn at Lavender Hall Farmhouse; and
 - Castle Bromwich Conservation Area.

8.3 Local Control Measures

- 8.3.1 Where practicable, construction methodologies will be required to reduce the impacts on heritage assets. The CoCP sets out the provisions that will be adopted to control those effects, including the use of appropriate equipment and methods to limit ground disturbance and settlement followed by monitoring, protection and remediation. A programme of settlement monitoring and the implementation of avoidance measures where appropriate will be undertaken by the Contractor. Detailed provisions with regarding settlement and listed buildings are outlined in the Settlement Policy / HS2 Information Paper: C3 Ground Settlement.
- 8.3.2 Those listed buildings to be demolished, altered or relocated are named in Table 1 of Schedule 18 of the Act⁹ and are the subject of Heritage Agreements with SMBC and Historic England. These agreements require details of works concerning each of the listed buildings to be submitted to SMBC for approval, and Historic England for consultation where applicable, SMBC for approval, and Historic England for consultation where applicable.
- 8.3.3 In addition, those listed buildings which may require works to maintain or restore their character, or for the affixing of monitoring apparatus are named in Table 2 of Schedule 18 of the Act¹⁰. Listed buildings named in Table 2 are also covered by a Heritage Agreement with SMBC, which sets out arrangements for obtaining approvals for protective or monitoring works to these buildings.
- 8.3.4 Where practicable, below ground assets will be preserved in situ beneath mitigation earthworks through the adoption of appropriate design measures.
- 8.3.5 Where practicable, construction methodologies will reduce the impacts on buried and upstanding remains.
- 8.3.6 The programme of archaeological and built heritage works will be undertaken by a specialist Contractor appointed by the Nominated Undertaker prior to and during the construction period in accordance with the provisions of the LS-WSI for archaeology and built heritage.

⁹ https://www.legislation.gov.uk/ukpga/2017/7/schedule/18

¹⁰ https://www.legislation.gov.uk/ukpga/2017/7/schedule/18

8.4 Monitoring

8.4.1 Appropriate monitoring of heritage will be undertaken as necessary, as detailed within Section 8.4 of the CoCP.

9 Ecology

9.1 General

9.1.1 General control measures relating to ecology are provided in Section 9 of the CoCP.

9.2 Sensitive Receptors

- 9.2.1 The Contractor will be made aware of locations designated for nature conservation, which are located within or adjacent to the scheme in the SMBC area.
- 9.2.2 Designated sensitive habitat receptor sites are shown in the Volume 5 map books of the ES (Volume 5, Ecology Map Books CFA18-19 & 23-25) and SES and AP2 ES (Volume 5 Environmental Topic Map Books: Ecology CFA18-19 & 23-25). From south to north, these include:
 - Little Poors Wood LWS a small deciduous woodland of 1.2ha in size with habitat of principal importance;
 - Beanit Farm Hedge LWS a species rich hedgerow with a small section within the construction area;
 - Kenilworth Greenway Country Park a disused railway that is mainly wooded with small patches of course grassland;
 - Berkswell Marsh SSSI the SSSI is located adjacent to Sixteen Acre Wood on the Berkswell Estate, 10m east of the land required for construction;
 - Berkswell Marsh Meadow LWS a large field mainly comprising species-rich marshy grassland. The northern and eastern sections are within land required for construction;
 - River Blythe SSSI the channel of the River Blythe is designated as a SSSI. The River Blythe is crossed by the route of the scheme. Two short stretches of the river are located within land required for construction, one to the north of the B4102 Meriden Road and another at Stonebridge Island;
 - Patrick Farm Meadow LWS an area of species-rich semi-improved and marshy grassland that is located within the land required for construction;
 - Mouldings Green Farm, Hampton-in-Arden LWS a linear mosaic of habitats located within the River Blythe SSSI floodplain. The southern section lies within the land required for construction;
 - Denbigh Spinney LWS an area of wet woodland that is located within the land required for construction; and
 - Coleshill Pool Wood LWS an area of broad-leaved semi-natural woodland that lies within the land required for construction.

- 9.2.3 Sensitive habitat receptors outside of designated sites are displayed within the following series of Volume 5 maps of the main ES and relevant SES and AP amendments (EC-001-50b to EC-001-055 and EC-001-66a to EC-001-067). These include:
 - Bayleys Brook channel (where it leaves Berkswell Marsh LWS but before its confluence with the River Blythe SSSI);
 - Marsh Lane nature reserve;
 - Horn Brook;
 - Shadow Brook;
 - Hollywell Brook;
 - An unnamed brook at Denbigh Spinney LWS;
 - Broadleaved woodland located at Marlowes Wood and Sixteen Acre Wood;
 - Broadleaved plantation woodland within;
 - Land to the west of The Roughs and north of Lodge Farm;
 - Land to the south of The Roughs;
 - Marlowes Wood, to south of Berkswell Marsh SSSI;
 - Species-rich semi-improved neutral grassland at:
 - Odnaull End Farm; and
 - Beechwood Farm.
 - Fields adjacent to River Blythe SSSI and land adjacent to Park Farm;
 - Hedgerows throughout the area, including:
 - West of Kenilworth Greenway;
 - To the south of Lavender Hall Lane; and
 - At Park Farm and Brickfield Farm.
 - Lakes, ponds, and small water bodies in various locations, including:
 - To the north of Packington Lane and east of the A446 Stonebridge Road;
 - At Brickfield Farm, to the west of Coleshill and Bannerly Pools SSSI; and
 - Pendigo Lake.
 - Marshy grassland and marginal vegetation on both sides of Hollywell Brook at Park Farm;
 - Farm and along the east side of the River Blythe; and
 - The River Cole.
- 9.2.4 Key protected or important species, species groups or assemblages known or assumed to occur in the vicinity of the land required are:
 - Bats;
 - Breeding and wintering birds (particularly barn owl);
 - Great crested newt;

- Common amphibian species (common toad, common frog, and smooth newt);
- Otter;
- Common reptile species (common lizard, slow-worm, and grass snake);
- Water vole;
- Badger;
- Notaris scirpi (a species of weevil);
- Aquatic-macro invertebrates (diving beetles including Rhantus suturalis and Hydroporus neglectus);
- Floating club-rush; and
- Fish assemblages (including stone loach, brown trout and bullhead).
- 9.2.5 The Contractor should be aware of the potential presence of legally notifiable nonnative invasive species within or in the vicinity of land required for the scheme, including:
 - Japanese knotweed and variegated yellow archangel including within land required, at and adjacent to Denbigh Spinney LWS and Olympia Motorcycle;
 - Himalayan balsam within land required, including at Mouldings Green Farm and along the River Blythe; and
 - Rhododendron including at a location less than 100m west of Coleshill and Bannerly Pools SSSI.
- 9.2.6 Further information on designated sites and legally protected species occurring in this area can be found within Volumes 2 and 5 of the main ES.
- 9.2.7 Contractors will minimise the loss of sensitive habitat receptors wherever possible. Translocation of soils from ancient woodland sites will be undertaken following the design specifications set out in the relevant Ecology Site Management Plans.
- 9.2.8 Contractors will check whether any protected species licences are required prior to work commencing or where such licences have been obtained, to ensure compliance with the requirements of the licence.
- 9.2.9 All actions required to comply with licences will be undertaken by suitably qualified specialist ecologists licensed to undertake the work.

9.3 Local Control Measures

9.3.1 The standard ecological issues and associated control measures outlined in Table 1 are of particular relevance to this area.

Table 1:Standard ecological issues and control measures relevant to this area

Receptor	Issue	Standard control measure
Designated nature conservation sites	There are two SSSIs and seven LWSs which are located either wholly or partly within, or otherwise adjacent to the scheme.	Measures to reduce habitat loss should be included in planning of construction works, such as avoiding siting temporary material stockpiles, construction materials and vehicle parking within designated sites. Potentially hazardous materials should also be located away from designated sites and stored correctly. Specific measures for control of surface water and for air and
		of these designated sites.
Ancient woodland	The scheme will result in the loss of ancient woodland	Measures to reduce habitat loss should be included in planning of construction works. Translocation of ancient woodland soils and vegetation will be undertaken where appropriate, following the design specification set out in the relevant Ecology Site Management Plans.
Bats	All UK bat species and their roosts (even if bats are not present) are fully protected under both UK and European legislation. The scheme will result in the loss of confirmed bat roosts in trees and buildings.	Adhere to requirements of licenses and, where relevant, Ecology Site Management Plans.
	The scheme will result in the loss of trees and buildings identified as having moderate or high potential to support roosting bats, but no evidence of their use has been recorded to date through survey work.	Adopt precautionary approach. Follow appropriate Working Method Statement for demolition of buildings and felling of trees.
	Retained bat roosts are present in close proximity to the scheme. Caution is required to ensure that	Where practicable, undertake activities causing disturbance during seasonal periods when bats are likely to be absent. Ensure lighting is directed away from known roosts. Reduce nighttime working in close proximity to retained roosts.

	these roosts are not disturbed during works.	Where practicable, temporary structures will be erected to screen the entrances/exits of retained roosts from construction areas.
		Where practicable, undertake activities causing loss or disruption during seasonal periods when bats are likely to be less active.
	The scheme will result in the loss of and disruption to bat foraging areas and commuting routes.	Retain as much of the key habitat for as long as possible and establish new areas as quickly as possible to reduce the effects.
		Ensure lighting is directed away from foraging areas and commuting routes.
		Reduce nighttime working in close proximity to foraging areas and commuting routes.
Breeding birds	The nests and eggs of all bird species are legally protected against being damaged or taken. Some species are specially protected against disturbance whilst nesting. The scheme will result in the loss of nesting bird habitat, including vegetation, buildings and structures	Habitat clearance should be conducted outside of the bird nesting season (March to August inclusive) where practicable. If habitat clearance is carried out during the bird nesting season, then an appropriate Working Method Statement shall be completed in advance of clearance works commencing.
Great crested newt	Great crested newts and their habitats are fully protected under both UK and European legislation. The scheme will result in the loss of water bodies and terrestrial habitat used by great crested newts.	Adhere to requirements of HS2 great crested newt organisational licence, method statements, and Ecology Site Management Plans.
Common amphibians	The scheme will result in the loss of water bodies supporting common amphibians. Clearance during peak periods of occupation could result in the loss of these populations.	Drain down of ponds should be conducted outside of the main breeding period for amphibians (March to August) where practicable. If drain down of ponds is carried out during the main breeding period, then an appropriate Working Method Statement shall be completed in advance of drain down works commencing.
Common reptiles	Common species of reptile (grass snake, adder, common lizard and slow worm) are protected from intentional killing or injury. Common reptiles are widespread, and the scheme will result in the	Where works have the potential to kill or injure reptiles, but there is suitable habitat immediately adjacent to the work site that could support a viable population (with enhancements where necessary) the Habitat Manipulation and Displacement approach should be followed. A Working Method Statement should be produced in advance of works commencing. Where there is no suitable habitat immediately adjacent to the work site, the Reptile Translocation approach should be followed. A Working Method Statement should be followed.

	loss of confirmed and potential reptile habitat.	works commencing. This will include details of the approach, any exclusion fencing required, and details of the receptor site.
Badger	Badgers and their setts are protected under the Protection of Badger Act 1992. Badgers are widespread, and the scheme will result in the loss of badger habitat, including setts.	Adhere to the requirements of the HS2 badger organisational licence, method statements, and Ecology Site Management Plans. Avoid badger setts to reduce disturbance where they do not need to be closed. Badgers are a mobile species and can create new setts in a short period of time. Contractors to be aware of the potential for badger setts to be present within or adjacent to work sites – works are to be stopped if potential setts are identified and an ecologist contacted for advice.
Otter	Otters are fully protected under both UK and European legislation. All major watercourses crossed by the scheme have otters present or are potentially suitable to support them. It is not expected that there will be any fragmentation of otter movement routes, however, there is the potential for disturbance of otter territory during construction along some parts of the scheme.	Adhere to requirements of licenses and, where relevant, Ecology Site Management Plans. Ensure that routes of safe passage for otters are maintained throughout construction at crossing points. Use fencing as required to prevent otters being forced over existing road crossings. Reduce light spill onto watercourses.
Water vole	Water voles are fully protected under UK legislation. The scheme will result in the loss of confirmed and potential water vole habitat.	An appropriate Working Method Statement should be produced in advance of works commencing, where relevant. Adhere to the requirements of translocation license, where relevant. Contractors are to be aware of the potential for water voles to be present within or adjacent to work sites – works to be stopped if water vole evidence is identified and an ecologist contacted for advice.
Weevil Notaris scirpi	Works associated with the scheme will result in the loss of marginal vegetation alongside Hollywell Brook.	Adhere to requirements of method statements for the provision of marginal habitat alongside the Hollywell Brook.
Diving beetles	Works associated with the scheme will result in the loss of ponds at the following locations which support notable diving beetle assemblages including three county rare species (Helochares lividus,	Adhere to requirements of method statements for the provision of two new ponds south of Coleshill and Bannerly Pools SSSI.

	Hygroglyphus geminus and Rhantus suturalis): Beechwood Farm; North of Middle Bickenhill Lane; Brickfield Farm.	
Floating club - rush	Works associated with the scheme will result in the loss of ponds that support the county rare floating club-rush to the north of Middle Bickenhill Lane.	Adhere to requirements of method statements for the translocation of floating club-rush to the proposed receptor site south of Coleshill and Bannerly Pools SSSI.
Invasive plants	There is a risk of work sites and adjacent land supporting invasive non- native species (INNS), as defined in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), in particular Japanese Knotweed. INNS have been recorded along some parts of the scheme through previous survey work	All land required for the works and immediately adjacent land (where practicable) shall be surveyed for the presence of INNS, with a focus on high-risk species. A Biosecurity Management Plan shall be produced in advance of works commencing, where required.
Aquatic wildlife such as fish, eels and aquatic invertebrates	There are watercourses within the vicinity of the works, some of which have been identified as supporting aquatic wildlife which could be at risk of direct impacts during channel works or indirectly from contamination.	Part of the monitoring strategy for watercourses, informed by work carried out for the Environmental Statements and for Water Framework Directive assessments, is to include a plan for monitoring pre, during and post construction where aquatic species are identified as sensitive receptors. These monitoring plans will be agreed by the Environment Agency. Local control measures will include protection of aquatic species, where necessary. Moving fish will be undertaken in accordance with the necessary Environment Agency authorisation.
General	Unexpected discovery of legally protected species during works	There will be a procedure to follow in the unexpected event that protected species identified during construction. This will include seeking appropriate licenses and consulting with Natural England. Unexpected finds of great crested newts or badgers are covered by the organisational licenses and works must be in accordance with those licenses.

9.3.2 Further information on the control of ecological impacts is provided in HS2 Information Paper E2: Ecological Impact, Section 9 of the CoCP, and in Technical Note: Ecological principles of mitigation within Volume 5 of the main ES (identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2).
9.4 Ecological mitigation sites

9.4.1 LMJV have constructed a number of ecological mitigation sites to compensate for the loss of habitats due to the construction of the HS2 scheme, to form receptor sites for species translocated from the construction area to create biodiversity gain. The sites in Table 2 have been constructed to date in the SMBC area.

Name of site	Location	Details of site
SK157	Burton Green	The Site will provide a native woodland planting area for the scheme.
		The creation of 3 ponds, for amphibian habitat;
		Creation of compensatory habitat (to be determined) and / or enhancements for roosting bats;
		Woodland planting to support a range of species;
SDo6A	Beechwood Culvert	Reptile bank for basking habitat;
55007		Design of egg laying pile and hibernaculum for grass snake and other reptiles;
		Woodland edge habitat creation and provision of basking areas to support reptiles; and
		Creation of native broadleaf woodland.
		Habitat replacement – native broadleaved woodland to mitigate for the following ecological receptors:
	BIS Cluster	Coleshill Pool Wood;
		Denbigh Spinney; and
		Sidings Wood.
		Translocation of important hedgerow;
		Creation of roosting features, foraging and commuting habitat for bats;
		Creation of bird nesting and foraging habitat; and
		Enhancement of terrestrial habitat for reptiles and badgers.
		Ponds and terrestrial habitat for Great Crested Newts;
SD17	Park Lane Cluster	Creation of basking, foraging, commuting, hibernation and egg-laying habitat for reptiles;
		Creation of basking, foraging, commuting and shelter habitats for invertebrates;

Table 2: Ecological mitigation sites in the SMBC

		Provision of badger connectivity and foraging opportunities by planting fruit and nut bearing shrubs and trees;	
		Provision of foraging and commuting habitat for bats connecting to the wider landscape;	
		Provision of nesting and sheltering opportunities for Hazel Dormouse;	
		Creation and enhancement of existing habitat for birds including nesting opportunities with woodland planting; and	
		Enhancement of existing hedgerows and reception of a translocated hedgerow.	
		Marshy grassland translocation;	
		Supplementary seeding;	
		Creation of neutral grassland;	
		Translocation of species-rich hedgerow;	
		Creation of bat roosting, foraging and commuting habitat;	
SD45 and SD 45a	River Blythe	Creation of bird nesting, foraging and commuting habitat;	
		Creation of basking, foraging, commuting, hibernation and egg-laying habitat for reptiles;	
		Creation of shelter/hibernation habitat for amphibians;	
		Creation of badger foraging and the provision of an artificial badger sett; and	
		Creation of terrestrial invertebrate habitat.	
		The creation of two new ponds for supporting Great Crested Newts as a result of the loss of an existing pond;	
SD26	Sixteen Acre Wood	Increased provision of suitable terrestrial habitat for Great Crested Newts;	
		Increased provision of bat foraging habitat;	
		Increased provision of suitable terrestrial of bird nesting, foraging and commuting habitat; and	
		Landscape integration and habitat connectivity.	

9.5

9.5.1 Further ecological mitigation sites are yet to be designed and will be detailed in further versions of the LEMP once the design is complete.

9.6 Monitoring

9.6.1 Contractors will be required to undertake appropriate monitoring of the consequences of construction works on ecological resources and of the effectiveness of the management measures designed to control ecological effects, as detailed within Section 9.3 of the CoCP.

10 Ground Settlement

10.1 General

- 10.1.1 General control measures relating to ground settlement are provided in Section 10 of the CoCP. Specific measures to reduce and repair settlement and requirements with regard to assessment, surveys and monitoring are contained in the Settlement Policy / HS2 Information Paper C3: Ground Settlement.
- 10.1.2 Requirements for monitoring will be confirmed by the settlement report prepared during the detailed design stage. Where determined as necessary, monitoring will be undertaken on selected adjacent buildings, structures and the conventional railway tracks. Baseline readings will be taken prior to the commencement of excavation.
- 10.1.3 The monitoring strategy, methodology and programme, including the choice and location of monitoring equipment, will be discussed and agreed with the local authorities and land/building owners prior to commencement of construction.
- 10.1.4 Where significant building movement is predicted to be caused by excavation induced ground movements, ground treatment/improvement techniques might be required to ensure that if ground movement occurs, it stays within agreed and acceptable limits thereby limiting the impacts on buildings.
- 10.1.5 Monitoring may be required where existing sensitive buildings/structures/utilities are in close proximity to the planned excavation works. An assessment of the sensitivity of each building/structure/utility in close proximity to the excavation works will be carried out at the detailed design stage. This will then inform the design/specification of the monitoring system for that building/structure/utility and will also inform the design of any movement mitigation works if these are deemed necessary by the designer.

10.1.6 Prior to the commencement of construction, structural surveys and condition/defect surveys will be commissioned where structures are at likely risk of potentially damaging settlements.

11 Land Quality

11.1 General

- 11.1.1 Further land quality study work including intrusive ground investigation (where needed) and analysis will be conducted prior to construction in order to confirm areas of suspected land contamination that could be disturbed or encountered during construction of the scheme. Contaminated sites beyond the scheme will be considered only in terms of its potential impact on the scheme. For the purposes of this LEMP it is assumed that no new land quality constraints will be identified during these pre-construction surveys. If new constraints are identified, then the LEMP would be updated accordingly. No contaminated sites (in accordance with the meaning defined in Part 2a of the Environmental Protection Act, 1990) have been formally identified by the Regulator (in accordance with and the Contaminated Land (England) Regulations 2000) within the scheme.
- 11.1.2 General control measures relating to land quality are provided in Section 11 of the CoCP.

11.2 Potential contamination sources and sensitive receptors

11.2.1 The following table shows land with potentially contaminative (existing or historical) uses that has been identified as a possible contaminative risk to HS2 works within the SMBC area:

Table 3: Land with potential contamination

Note: reference numbers are from the HS2 environmental statement.

Sites	Land
Infilled pond (LQ-01-050a, I7);	Dismantled railway (LQ-01-050a, G6),

Infilled pond (LQ-01-050a, G6)	Infilled pit (LQ-01-050a, G6),
various other sites (LQ-01-050a F6; LQ-01-050a, F6; LQ- 01-050a, E6; LQ-01-050a, E7; LQ-01-050a, E6; LQ-01- 050a, E6; LQ-01-050a, E6; LQ-01-050a, D6)	Infilled ponds (LQ-01-050a, E6)
Berkswell electricity station (LQ-01-050b,	F5, F6, G5, G6), Infilled pond (LQ-01-050b, E6)
Kenilworth to Balsall dismantled Railway (LQ-01-050b, beginning in B7, ending in I6)	Lavender Hall Landfill (LQ-01-051, G7, H7)
Lavender Hall Farm (LQ-01-051, G7)	Infilled marl pits (LQ-01-051, H6, H7 and F7)
Lincoln Farm Café Landfill (LQ-01-052, H7)	Infilled sand and gravel Pit (LQ-01-052, A5)
Berkswell Quarry restored (LQ-01-052, G6 and G7);	Possible historical munitions storage area (LQ-01-052, F6 and F7)
Infilled sand and gravel pit (LQ-01-052, F7)	Jacksons Brickworks (LQ-01-053, H6, H7, H8, I6, I7, I8, I9, J7, J8, J9);
Infilled pond (LQ-01-053, H8);	Cottage Farm (LQ-01-053, H8);
Hampton in Arden to Shustoke dismantled rail line (LQ- 01-053 runs north west – south east across site, relevant sections begin in G6 and end in H8)	Myrtle Cottage Farm and Garage Services (LQ-01-053, G8);
Park Farm Quarry (LQ-01-053, E6, F5, F6);	Backfilled borrow pits associated with M42 construction (LQ-01-053, D7, E7, F7, E8, F8)
Historic Warren Farm with tank (LQ-01-053, E8);	Park Farm (LQ-01-053, F5)
Middle Bickenhill Landfill (LQ-01-053, E6)	Infilled pits (LQ-01-053, E5);
Brackenlands Farm Landfill (LQ-01-053, B5, B6)	

- 11.2.2 The Contractor will have due regard to the following sensitive receptors that have the potential for risk of contamination:
 - People, including residents in existing properties, local employees, construction and/or maintenance workers;
 - Surface water, including the River Blythe, River Blythe Bypass Channel, Bayleys Brook, Shadow Brook, Hollywell Brook, River Cole, artificial and natural ponds and drains and several unnamed watercourse/ditches;
 - Controlled waters, including groundwaters in Principal aquifers (Tile Hill Mudstone and Bromsgrove Sandstone), various Secondary A aquifers and Secondary B aquifer (Mercia Mudstone);
 - The built environment, including buildings, property and underground structures and services; and
 - The ecological natural environment including, River Blythe SSSI, Berkswell Marsh SSSI, and the species they support.

11.3 Local Control Measures

- 11.3.1 Ground investigations are to be undertaken to assess areas of potential contamination within the scheme. Following a conceptual site model and risk assessment a remedial strategy will be prepared, as needed. Consultation with SMBC and the Environment Agency will take place, as appropriate, during the formulation of any remedial strategy, which will include measures to be taken if unexpected contamination is encountered as outlined in Section 11 of the CoCP.
- 11.3.2 Contaminated soils excavated from the site are to be separated from other materials and treated as necessary. Where reasonably practicable, material will be reused within the scheme, where it is suitable for use. Treatment techniques could include stabilisation methods, soil washing and appropriately permitted bio-remediation to remove oil contaminants and disposal off site. For material from SMBC, this may take place off-site at a soil treatment facility or an appropriately permitted landfill site.
- 11.3.3 Excavation through Middle Bickenhill Lane historical landfill sites in the SMBC area will be required. A remediation strategy for Middle Bickenhill Lane historical landfill is currently being prepared following ground investigation works. Should the ground investigation discover contaminated materials within the area required to construct the cutting in these locations, it will be excavated, then treated and re-used, or removed, as appropriate. In addition, ground (landfill) gas and/or leachate control systems will be constructed where necessary to manage ingress to the scheme or to control migration pathways external to the works where pathways have been created or adversely affected adversely by the construction.
- 11.3.4 Similar measures will be undertaken at other sites where contaminated soils or groundwater are identified during the investigation and / or construction processes.

11.4 Minerals

- 11.4.1 The scheme crosses a number of Mineral Safeguarding Areas in the SMBC area, including those for building stone, sand and gravel and coal as well as Preferred Areas for sand and gravel extraction. Some of these sites have current planning permission for mineral extraction within the scheme boundary.
- 11.4.2 Mitigation of potential impact on these mineral resources can include prior extraction of the resource for use within the scheme or elsewhere. Extraction may be limited to areas of environmental mitigation earthworks within the scheme adjacent to rather than beneath the track bed, which will require good founding

conditions. A plan will be discussed in advance of the construction works with the landowner and/or mineral owner, the mineral planning department at SMBC and any other interested parties to assist in achieving an effective management of minerals within the location of the affected Mineral Safeguarding Areas as well as Preferred Areas and Areas of Search.

12 Landscape and Visual

12.1 General

12.1.1 General control measures relating to landscape and visual effects are provided in Section 12 of the CoCP.

12.2 Sensitive (Significantly Affected) Receptors

- 12.2.1 With reference to the set-up and location of temporary works, the Contractor will have due regard to limiting impacts of the character on the following landscape character areas (LCAs):
 - Coventry Rural Fringe LCA;
 - Balsall Common Rural LCA;
 - Solihull Rural Heartland LCA;
 - Balsall Common residential LCA;
 - Blythe Valley LCA;
 - Hampton-in-Arden LCA;
 - M42 Corridor LCA;
 - Chelmsley Wood LCA; and
 - Cole Valley LCA.

The LCAs are detailed in Volume 5 of the ES (Appendices LV-001-001 and LV-001-003).

- 12.2.2 The Contractor will also have due regard to limiting visual intrusion on the following visual receptors:
 - Residents in the area, particularly on the edges of Balsall Common, Berkswell, Brandocks Marsh, Hampton-in-Arden, Kingshurst, Bacon's End, Smith's Wood, along Middle Bickenhill Lane, Waste Lane and Hodgett's Lane, and Chelmsley Wood, as well as isolated residences interspersed throughout the landscape;

- Recreational users of the extensive network of footpath, cycleways and bridleways near the scheme, including the Kenilworth Greenway, the Heart of England Way (M214), M215, M216, M217, M186, Green Lane (M77), M54 and M55 and PROW generally within 1km of the route;
- Patrons of leisure based commercial enterprises including Lavender Hall fisheries, the Berkswell Estate, Marsh Lane Nature Reserve, the Packington Estate, the Toby Carvery and The Little Owl Public Houses, visitors to Melbecks Garden & Leisure Centre, the NEC and the National Motorcycle Museum and users of Heath Park and Bluebell Recreational Ground;
- Employees in commercial units at Little Beanit Farm Holiday Cottages, Patrick Farm, Quartz Point Business Park, Birmingham Business Park and throughout the NEC complex; and
- People travelling through the area along roads, including along Waste Lane, Truggist Lane, Hodgetts Lane, A452 Kenilworth Road, B4102 Meriden Road, Diddington Lane, Cornets End Iane, Middle Bickenhill Lane, A452 Chester Road, Solihull Parkway, A446 Stonebridge Island, Coleshill Heath Road, A45 Coventry Road the M42 and the B4118 Water Orton Road.
- 12.2.3 The lead Contractor shall also discuss the possibility of advance planting off-site with landowners in the SMBC area to further screen the locations listed above.

12.3 Local Control Measures

- 12.3.1 Measures that have been incorporated into the CoCP to avoid or reduce landscape and visual effects during construction include the following (see main ES Volume 5):
 - Maximise retention and protection of existing trees and vegetation where possible;
 - Use well-maintained hoardings and fencing;
 - Design lighting to avoid unnecessary intrusion onto adjacent buildings and other land uses;
 - Trees intended to be retained which may be accidentally felled or die as a consequence of construction works will be replaced;
 - Prevention of damage to the trees and landscape features adjacent to the construction sites due to movement of construction vehicles and machinery;
 - Appropriate design, implementation and maintenance of planting and seeding works and implementation of management measures, to continue through the construction period as landscape works are completed;
 - Position temporary bunds to be positioned to screen views to the route construction;

- The design of construction compound layouts to prevent damage to the retained trees as well as reduce visual and other impacts where practicable; and
- Identify specific locations of temporary material stockpiles to reduce visual impacts.

12.4 Trees

- 12.4.1 Where reasonably practicable the contractors will give consideration to where trees and other potential planting could be established early in the construction programme.
- 12.4.2 The Contractor will carry out surveys and agree the details of tree retention and protection measures, in accordance with BS 5837:2012 Trees in relation to design, demolition and construction recommendations, with SMBC in advance of any work in the vicinity of trees.

12.5 Site Buildings for Office and Welfare

12.5.1 Buildings will generally be of a temporary modular type; they will typically be multistorey to maximise construction space and limit land take.

13 Noise and Vibration

13.1 General

13.1.1 General control measures relating to noise and vibration are provided in Section 13 of the CoCP and additional information is provided in Information Paper E23: Control of construction noise and vibration.

13.2 Sensitive Receptors

- 13.2.1 Noise and vibration construction assessment locations, at sensitive residential and non-residential properties, are identified within Noise and Vibration SES2 and AP3 Volume 5 SV-03 and SV-04 map series (ref.: ES 3.5.1.9.3 and 3.5.1.9.4).
- 13.2.2 Noise insulation is being offered for qualifying buildings as defined in the noise insulation and temporary rehousing policy within HS2 Information Paper E23. Construction noise assessments are undertaken covering works in the SMBC area for six to 12 months ahead. These identify any properties at which direct significant construction noise or vibration effects that would trigger offers for Noise Insulation or Temporary Rehousing are likely to occur. The timing of these assessments has been evaluated to be early enough so that noise insulation can be installed, or temporary rehousing provided, before the start of the works predicted to exceed noise insulation or temporary rehousing criteria. Properties requiring mitigation will be identified in the relevant application for prior consent under Section 61 of the Control of Pollution Act 1974.
- 13.2.3 The application of Best Practicable Means of noise and vibration control in accordance with the HS2 Phase 1 Code of Construction Practice, Information Paper E23 'Control of Construction Noise and Vibration' and BS5228-1:2009+A1:2014 will avoid airborne construction noise adverse effects on the majority of residential receptors, communities and non-residential sensitive receptors. Despite this, some noise sensitive receptors will still experience higher levels of construction noise or vibration (often, but not exclusively, associated with interfaces to existing infrastructure such as roads or railways where construction works must be performed at night during temporary closures (often termed 'possessions') of the existing infrastructure assets).
- 13.2.4 Non-residential sensitive receptors for which the ES, or subsequent SES and AP reports, have reported likely direct significant adverse effects from construction

noise and/or vibration after BPM of noise and vibration control has been applied are located at:

- British Legion Club, located on Station Road, Balsall Common;
- Bibury House guest house located on the A452 Kenilworth Road north of Balsall Common;
- Commercial units at Patrick Farm, B4102 Meriden Road;
- The site of the Island Project School at Diddington Hall, depending on the future use of the site;
- The Toby Carvery, Stonebridge Island;
- The closest NEC buildings to the people mover, Exhibition hall 1 and the Pavilion area;
- Crowne Plaza Birmingham NEC and Hilton Birmingham Metropole hotels at the NEC;
- Novotel, Ibis and Etap hotels at Birmingham Airport; and
- Proposed new hotel at Birmingham Airport adjacent to Diamond House offices.
- 13.2.5 Residential communities for which the ES, or subsequent SES and AP reports, have reported likely direct significant adverse effects from construction noise and/or vibration after BPM of noise and vibration control has been applied are located at:
 - Approximately 10 dwellings off Truggist Lane, Berkswell;
 - Approximately 5 dwellings on Lavender Hall Lane, Berkswell; and
 - Approximately 10 dwellings on the A452 Kenilworth Road, north of Balsall Common.

13.3 Local Control Measures

- 13.3.1 Site specific best practicable means measures to control noise and vibration have been identified through the Parliamentary process and discussions with SMBC, and are reflected in this document. Furthermore, site specific measures will be identified by the Contractor on a site-by-site and activity-by-activity basis and agreed with SMBC through the Section 61 process.
- 13.3.2 As identified in the ES, examples of best practicable means measures that may be employed by the lead Contractor to control noise and vibration include:
 - Controlling noise and vibration at source for example the selection of quiet and low vibration equipment, review of construction programme and methodology to consider quieter methods;

- Arranging the layout of compounds to reduce noise impacts where construction compounds are in close proximity to noise sensitive receptors. This may include placing any stacked portacabins between noisy works and sensitive receptors; and
- Additional height hoardings which may, on occasion, be used to control construction noise. These will be subject to approval in accordance with the requirements of Schedule 17 Part 1 of the Act.
- 13.3.3 Local control measures will be periodically reviewed, including following any material changes in the proposed construction method and appointment of the works Contractor.
- 13.3.4 Two residential buildings (Patrick Farm, Meriden Road and Park Farm, Chester Road) were identified in the ES and/or subsequent SES and AP reports as potentially experiencing noise levels higher than the noise insulation trigger levels as defined in the CoCP (Section 13) and are closely monitored for noise levels. No noise exceedances have been recorded at those locations.
- 13.3.5 Qualifying properties will be periodically reviewed, including following any material changes in the proposed construction method and the local control measures and appointment of the works Contractor.

13.4 Monitoring

- 13.4.1 HS2 requires its Contractors to undertake and report such monitoring as is necessary to ensure and demonstrate compliance with all noise and vibration commitments and the requirements of the CoCP.
- 13.4.2 Monitoring arrangements change over time and are agreed with SMBC in Appendix 8 of each application for prior consent under Section 61 of the Control of Pollution Act 1974. SMBC has access to the real-time monitoring results for all noise, vibration and weather instruments within their jurisdiction, and BBV provides detailed results / analysis to HS2 within 10 days of the end of each calendar month for inclusion in the HS2 monitoring reports that are published by DfT. A The monthly reports include information such as measurement methodology and monitoring locations. These can be found on the UK Government website at this address: https://www.gov.uk/government/collections/monitoring-the-environmental-effectsof-hs2.
- 13.4.3 All noise and vibration monitoring equipment should hold a valid calibration certificate issued by either a United Kingdom Accreditation Service (UKAS) accredited

calibration laboratory or equipment manufacturer. BBV has a route-wide programme of site calibrations (every three months) and laboratory calibration (every two years). Wherever practical, substitute equipment of the same specifications is provided while the original is sent for laboratory calibration to provide continuity of monitoring.

14 Traffic and Transport

14.1 General

- 14.1.1 Route-wide, local area 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 Public Rights of Way (PRoW) affected by the scheme as necessary. These measures are guided by Section 14 of the CoCP.
- 14.1.2 The CoCP sets out a number of measures to ensure the impacts from construction traffic on the local community are reduced by its Contractors where reasonably practicable:
 - A route-wide Traffic Management Plan (RTMP) setting out generic traffic management measures to be implemented during the construction of the scheme;
 - The Local Traffic Management Plans (LTMP) will set out matters such as planned worksites, lorry routes and the programme of major traffic;
 - Contractors will prepare site specific traffic management measures, which will be subject to consultation and, as necessary, consent;
 - Contractors will prepare construction workforce travel plans with the aim of encouraging the use of sustainable modes of transport to reduce the impact of workforce travel on local residents and businesses; and
 - For road cleanliness Contractors will be required to use all reasonably practicable measures to avoid/limit and mitigate the deposition of mud and other debris on the highway.
- 14.1.3 HS2 will require its Contractors to undertake such appropriate monitoring as is necessary to ensure compliance with the requirements of the CoCP, and this will include the maintenance of records of traffic management measures installed.
- 14.1.4 Information relating to construction traffic is also provided in the following Information Papers:
 - D11: Maintaining access to residential and commercial property during construction;
 - E13: Management of traffic during construction;
 - E14: Highways and traffic during construction legislative provisions; and
 - E30: Vehicle flow management and safety requirements during construction.

14.2 Local Control Measures

Sensitive Receptors

- 14.2.1 In relation to traffic and transport, key sensitive receptors will need to be considered when the Contractor develops the overall programme within the LTMP and the site-specific traffic management schemes.
- 14.2.2 These requirements will be addressed appropriately though the development of the LTMPs or site-specific measures and discussed at the Local Traffic Liaison Group meeting, established in accordance with the Code of Construction Practice and the Route-wide Traffic Management Plan.
- 14.2.3 In the SMBC area these include local roads that are affected by the scheme and include the following:
 - Pedestrians using footways to local roads, including;
 - B4101 Kelsey Lane/Waste Lane;
 - Diddington Lane;
 - the B4102 Meriden Road;
 - Park Lane;
 - Lavender Hall Lane;
 - Station Road/Truggist Lane;
 - Coleshill Heath Road;
 - Bickenhill Parkway;
 - Middle Bickenhill Lane;
 - Northway, Southway and East Way A45 Service Road), and
 - some of the main roads (listed below) and also 17 public rights of way (PRoW) affected by the scheme;
 - Cyclists using off-road cycle paths and a number of roads identified as advisory cycle routes, including:
 - Station Road/Truggist Lane;
 - Lavender Hall Lane;
 - Diddington Lane;
 - Old Station Road;
 - B4102 Meriden Road; and
 - Main Road;
 - Kenilworth Greenway; and
 - Strategic roads, including;
 - A452 Kenilworth Road;
 - A45 Coventry Road;
 - A452 Chester Road;

- A446 Stonebridge Road and
- the M6 and M42.
- 14.2.4 The roads listed may require road closure. Subcontractors will plan their work to avoid road closures but where this is not practicable, relevant consents will be applied for from the highways authorities.

Site Access

- 14.2.5 A number of vehicle access points to the construction sites will be required and so the construction vehicle movements will be spread over a number of roads within the area of the works. Highway access notifications and/or approvals will be undertaken in accordance with Schedule 4 of the Act.
- 14.2.6 Routes for construction traffic will be subject to approval of the relevant planning authority in accordance with the Schedule 17 of the Act when large goods vehicle movements exceed 24 single movements (12 two-way movements) per day to and/or from a site.
- 14.2.7 Any permanent highway works outside the limits of deviation as outlined in the Act will be subject to normal Highways legislation and Highway Authority powers.

14.3 Works to the Highway and Access Measures

- 14.3.1 Temporary and permanent road closures, overnight and at weekends, and diversions will be required. The scope is assumed as follows:
 - B4101 Waste Lane to construct a worksite access and for tie-in of the off-line Waste Lane overbridge;
 - Truggist Lane for construction of the viaduct;
 - Lavender Hall Lane to construct a bridge over the scheme;
 - B4102 Meriden Road to construct the overbridge;
 - Diddington Lane for tie-in of off-line highway works;
 - A452 Kenilworth Road for tie-in of off-line highway works;
 - M42 between junctions 6 and 7 and M42 junction 6 and M6 junction 4;
 - A45 Coventry Road, A452 Chester Road, A446 Stonebridge Road and the A452 Chester Road/A446 Stonebridge Road/Solihull Parkway roundabout;
 - B4438 Bickenhill Parkway; and
 - Roads around Birmingham Airport, Birmingham International station and the NEC, including Airport Way/Hermes Road roundabout, the Station Link Road, East Way, Pendigo Way, East Car Park Road and the Perimeter Road.

- 14.3.2 The northern section of Middle Bickenhill Lane will be permanently closed. Park Lane will be permanently diverted, with the existing alignment being closed.
- 14.3.3 Alternative temporary routes and permanent diversions are required for the following PRoW.
 - Kenilworth Greenway;
 - Footpath M114 (temporary and permanent);
 - Footpath M115 (temporary and permanent);
 - Footpath M191;
 - Footpath M192;
 - Footpath M196;
 - Footpath M197;
 - Footpath M214;
 - Footpath M215;
 - Footpath M216;
 - Footpath M217;
 - Footpath M218;
 - Footpath M230A; and
 - The footpath around Pendigo Lake.
- 14.3.4 Utilities works in the area may require lane or road closures but will only be for a short period.
- 14.3.5 A network of haul roads will be created within the area to minimise construction traffic on public highways.
- 14.3.6 In addition to road closures, traffic management will be in place on the A452 Kenilworth Road, the B4101 Waste Lane, Truggist Lane, Lavender Hall Lane, Park Lane, the B4102 Meriden Road, A45/A452 Stonebridge Island, the M42, including junction 6 and between junctions 6 and 7, the M6 junction 4, A452 Chester Road/B4438 Bickenhill Parkway roundabout, the A45 Coventry Road, A452 Chester Road, A446 Stonebridge Road and Coleshill Heath Road.
- 14.3.7 Civil engineering works will necessitate temporary rail track possessions in this area. Key railway systems installation works in this section of the route will take approximately nine months to complete and will include modification of the existing rail overhead line equipment to achieve a lower contact wire height, to accommodate the construction of the Carol Green Rail underbridge over the Rugby to Birmingham rail line. Disruption to rail users will be minimised by limiting

possessions, where reasonably practicable, to overnight, off-peak or weekend periods. Where necessary, rail replacement services will be provided.

14.3.8 All temporary closures and diversions will be subject to submissions and notifications to the relevant highway authority.

14.4 Monitoring Procedures

14.4.1 Each Contractor will be responsible for monitoring to ensure compliance with the relevant requirements of the RTMP, LTMP, the requirements of the provisions of the Act, assurances and undertakings, site specific drawings and site-specific traffic requirements and conditions.

15 Waste and Materials

15.1 General

- 15.1.1 General control measures relating to waste and materials are provided in Section 15 of the CoCP.
- 15.1.2 All waste will be managed in accordance with the waste hierarchy which aims to reduce waste at source and to reduce the quantity that requires final disposal to landfill. This applies to excavated material arising on-site, which will be reused within the scheme as far as reasonably practicable, as well as material from demolition and construction activities. This approach is described in greater detail in HS2 Phase One Information Paper E3: Excavated Material and Waste Management and in Section 15 of the CoCP.

15.2 Local Control Measures

Testing and Classification of Materials

- 15.2.1 The 'basic characterisation'¹¹ of excavated material will be determined by the Contractors to ascertain the potential for reuse, recycling, recovery or disposal to inert, non-hazardous or hazardous landfill.
- 15.2.2 A Materials Management Plan will be developed in accordance with the Definition of Waste: Development Industry Code of Practice¹² to set out the processes to be adopted in respect of the reuse of excavated materials either on the scheme or transferred to another development site.
- 15.2.3 In the event that excavated material is to be sent for disposal, which shall be the option of last resort, testing and classification will be undertaken by the Contractors in line with the Environment Agency's guidance. This includes:
 - Waste Sampling and Testing for Disposal¹³; and

¹¹ Basic characterisation refers to the characterisation of excavated material to help define the type of re-use for which it is suitable (e.g. DMRB soil classes). Characterisation of waste would include the allocation of an EWC code (in accordance with WM3) and a detailed evaluation of the waste properties. The latter is based on a combination of the detailed knowledge of the source process and chemical testing.

¹² CL:AIRE Definition of Waste Development Industry Code of Practice, version 2, March 2011.

¹³ Environment Agency (2013), Waste Sampling and Testing for Disposal to Landfill, March 2013.

• WM3 – Guidance on the classification and assessment of waste (Version 1.2 2021)¹⁴.

15.3 Transport of Waste and Materials

- 15.3.1 Excavated material produced in SMBC is unlikely to be surplus to the requirements of the scheme. In the unlikely event that surplus excavated materials are identified, these will be managed in accordance with the waste hierarchy as described above and the HS2 Excavated Materials Policy, which states:
- 15.3.2 '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 local construction projects.'
- 15.3.3 Opportunities for the off-site re-use of surplus excavated material will therefore be identified and utilised where reasonably practicable. Surplus excavated material will only be sent to landfill as an option of last resort. Further detail on the approach to the management of all excavated material may be found in the HS2 Phase One Information Paper E3: Excavated Material and Waste Management.
- 15.3.4 Excavated material from SMBC will be transported by rail where reasonably practicable. If rail transport is not reasonably practicable material will be transported by road.

¹⁴ Environment Agency (2021) Technical Guidance WM3 – Guidance on the classification and assessment of waste (Version 1.2 2021)

16 Water Resources and Flood Risk

16.1 General

16.1.1 General control measures relating to water resources and flood risk are provided in Section 16 of the CoCP.

16.2 Sensitive receptors

- 16.2.1 The Contractor will have due regard to the following sensitive local water resource receptors:
 - Local aquifers:

Tile Hill Mudstone – Carboniferous Warwickshire (Principal aquifer); Glaciofluvial sands and gravels (Secondary A aquifer); Alluvium (Secondary A aquifer); River terrace deposits (Secondary A aquifer); Arden Sandstone (Secondary A aquifer); Glaciolacustrine (Secondary A aquifer); and Mercia Mudstone (Secondary B aquifer).

• Surface water features:

River Blythe; River Cole (works are undertaken in the catchment of this river although it is not directly affected by works); Shadow Brook; Bayleys Brook; Horn Brook; Lavender Hall Fisheries; Berkswell Estate Fishing Lake; Hollywell Brook; Pendigo Lake; Unnamed watercourse at Denbigh Spinney; Tributaries of the River Tame; and Numerous ponds within and surrounding the land required for construction and 13 springs in close proximity.

- Water dependent habitats: River Blythe SSSI; Berkswell Marsh SSSI (wet woodland and marshy grassland); Patrick Farm Meadow LWS (marshy grassland); Mouldings Green Farm LWS (marshy grassland and ponds) and Denbigh Spinney LWS (wet woodland).
- Abstractions: Two licensed and three unlicensed groundwater abstractions.
- 16.2.2 The Contractor's pollution incident control plan will have due regard to the local flood risk sources (i.e., surface, artificial, groundwater and sewers) and key receptors and take into account any proposed risk management or mitigation measures.
- 16.2.3 The Contractor will have due regard to the following areas within Environment Agency Flood Zones 2 and 3, which are at risk of river flooding:
 - River Blythe;
 - Bayleys Brook;

- The River Blythe Bypass channel;
- Shadow Brook;
- Hollywell Brook;
- Denbigh Spinney watercourse;
- River Cole; and
- River Tame.
- 16.2.4 The Contractor will have due regard to the following local flood water receptors and their respective flood histories:
 - Surface water areas at risk of surface water flooding, as shown on the Environment Agency's Flood Maps for Surface Water. These are mostly associated with watercourses;
 - Sewer locations identified in both the Warwickshire County Council (WCC) and SMBC Strategic Flood Risk Assessment (SFRA) and Preliminary Flood Risk Assessment (PFRA); and
 - Groundwater locations identified in both the WCC and SMBC SFRA and the PFRA.

16.3 Potential Sources of Contamination

16.3.1 Potential sources of contamination are detailed within Section 11 of this LEMP.

16.4 Local Control Measures

- 16.4.1 Measures identified in Section 16 of the CoCP, including detailed method statements, will aim to reduce potential adverse effects on surface water or groundwater quality or flows associated with construction; this will include release to groundwater, watercourses or surface water from sewers to the surrounding receptors.
- 16.4.2 As outlined in the CoCP, BPM will be used (e.g., through the use of silt traps and appropriate attenuation, if required) prior to the discharge of water to watercourses, groundwater or surface water sewers, subject to obtaining the required permits or consents. This could apply to run off from wheel washing facilities or from general construction activities. As noted in Section 5.12 of this document, a pollution incident control management system will incorporate procedures for alerting relevant water supply companies and reducing impacts to public supply SPZs and local private abstractions in this area.

- 16.4.3 Where there is the possibility that work may affect aquifers, a groundwater monitoring plan will be implemented, as outlined in Section 16 of the CoCP.
- 16.4.4 A programme of groundwater and surface water monitoring will be undertaken prior to, during and following completion of the construction works. The monitoring programme scope and duration will be developed and agreed with the Environment Agency in consultation with relevant stakeholders as necessary (Lead Local Flood Authority (LLFAs) and Internal Drainage Board (IDBs)). A management strategy will also be agreed with the Environment Agency in consultation with relevant stakeholders that will cover any physical mitigation required for the protection of public water supply.
- 16.4.5 If dewatering from excavations is required, it will be carried out in consultation with the Environment Agency and SMBC for ordinary watercourses, will take into consideration risks posed to water quality or quantity.
- 16.4.6 If required, appropriate guidance will be adhered to, including the Piling and
 Preventative Ground Improvement Methods on Land Affected by Contamination:
 Guidance on Pollution Prevention¹⁵. Groundwater and surface water monitoring
 plans will be prepared, where piling could result in below ground contamination.
- 16.4.7 Temporary excavated material stockpiles, construction compounds and site offices will be located outside of areas at risk of flooding where reasonably practicable, to avoid affecting the level of risk of flooding. Where construction compounds cannot be located outside of flood risk areas, there will be a site-specific flood risk management plan prepared prior to construction to manage the potential risks. These plans will take account of the flood risk assessments produced for the main ES and include any proposed risk management or mitigation measures, if required in consultation with the EA.
- 16.4.8 Drainage from the works will be attenuated and discharged to watercourses or sewers, under agreement, at a controlled rate and, where required, with approval of the Environment Agency and, where appropriate, the drainage authority in accordance with Schedule 33 Part 5 of the Act.
- 16.4.9 In certain instances, the excavated retained cut is at a level below the natural ground water table. Mitigation, where necessary with continuous piles or grouting, will

¹⁵ Environment Agency (2001) Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution.

ensure that any changes to local groundwater levels and flow are minimised through the use of cut-offs and applying relatively short time-scales for dewatering.

16.4.10 Additional information, such as how the scheme complies with the Water Framework Directive (WFD), as well as further provisions for engagement with stakeholders, monitoring and protection of local water resources are outlined in HS2 Information Paper E1: Control of Environmental Impacts and HS2 Information Paper E4: Water Resources and Flood Risk.

Appendix A: Glossary of terms

Abbreviation	Full phrase
AP	Additional Provision
CFA	Community Forum Area
CoCP	Code of Construction Practice
Contractor	The Contractor on a construction site responsible for planning, managing and coordinating themselves and/or the works and all other contractors working on their site, or any other contractor directly employed by the Nominated Undertaker to undertake key construction works on site.
СРС	Safe Urban Driving Certificate of Professional Competence
DRI	Demolition Recovery Index
ECoW	Ecological Clerk of Works
EMR	Environmental Minimum Requirements set out environmental and sustainability commitments to be complied with by HS2 and its contractors. These form part of the High Speed Rail (London –West Midlands) Act 2017 and are legally binding
EMS	Environmental Management System
ES	Environmental Statement
FORS	Fleet Operators Recognition Scheme
GWSI: HERDS	Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy
HGVs	Heavy Goods vehicles
HS2	High Speed 2
HS2 Ltd	High Speed Two Limited – is a company wholly owned by the Department for Transport, established in 2009 to develop plans for a new high-speed network and present a proposed route connecting London – West Midlands.
IAQM	Institute of Air Quality Management
IP	Information Paper
LCAs	Landscape character areas
LEMP	Local Environmental Management Plan
LNR	Local Nature Reserve
LSWSI	Location Specific Written Scheme of Investigation
LTMP	Local Traffic Management Plan
LWS	Local Wildlife Site
NBRI	New Build Recovery Index
NEF	National Environment Forum, comprised of Government departments and statutory bodies and established to advise on environmental policy for HS2, including project-wide strategies

	for reducing the environmental impact of the line and principles for the Code of Construction Practice.
Nominated Undertaker	The body or bodies appointed to implement the powers of the Act to construct and maintain the railway.
PFRA	Preliminary Flood Risk Assessment
PRoW	Public rights of way
PWMS	Precautionary Working Method Statement
RRVs	Road Rail Vehicles
RTMP	Route-wide Traffic Management Plan
SBI	Site of Biological importace
Scheme	The scheme to which this CoCP relates is the high-speed railway between London - West Midlands. This is a high-speed railway between London - West Midlands with a connection via the West Coast Main Line at conventional speeds to the North West and Scotland and to the Channel Tunnel via HS1. It includes four high speed rail stations at London Euston, Old Oak Common (West London), Birmingham Airport (Birmingham Interchange) and Birmingham (Curzon Street).
Section 61	Section 61 of the Control of Pollution Act 1974 (which sets out procedures seeking and obtaining local authority consent to measures for the control of noise and vibration on construction sites).
SSMP	Site Specific Management Plan
SES	Supplementary Environmental Statement
SFRA	Strategic Flood Risk Assessment
SLI	Site of Local Importance
SMBC	Solihull Metropolitan Borough Council
SMI	Site of Metropolitan Importance
SPZ	Source Protection Zone
SRP	Soil Resources Plan
Third Party	For the purposes of the LEMPs, an organisation with whom HS2 Ltd has entered into a legal agreement to undertake works on its behalf, to be delivered under Act powers or the third party's own powers (e.g. permitted development). Such agreements require the third parties to comply with the requirements of the Act and the EMRs, including the CoCP. Third parties might include Network Rail, Highways England, and utility companies.
ТМР	Traffic Management Plan
ТРС	Traffic Plan Coordinator
U&A	Undertakings and Assurances: the commitments made in relation to the High Speed Rail (London to West Midlands) Act 2017
WFD	Water Framework Directive
WSI	Written Scheme of Investigation

Appendix B: Non-exhaustive list of community groups in SMBC

It is likely engagement with the following groups may be undertaken during construction including, but not limited to:

- SMBC;
- Local Members of Parliament;
- HS2 Community Forums:
 - Stoneleigh, Kenilworth & Burton Green (CFA 18);
 - Coleshill Junction (CFA19);
 - Balsall Common & Hampton in Arden (CFA 23);
 - Birmingham Interchange & Chelmsley Wood (CFA 24); and
 - Castle Bromwich and Bromford (CFA 25).
- Environment Agency;
- Natural England;
- Highways England;
- Transport for West Midlands;
- Network Rail;
- Birmingham Airport;
- Castle Bromwich;
- Chelmsley Wood Town Council;
- Bickenhill Parish Council;
- Hampton –in-Arden Parish Council;
- Balsall Parish Council;
- Berkswell Parish Council;
- Great Packington Parish Council;
- Little Packington Parish Council;
- Landowners/occupiers directly affected by the scheme;
- Local residents;
- Residents and community associations;
- Amenity groups;
- Emergency services;
- Representatives from local faith groups;
- Local businesses; and
- Warwickshire, Solihull and Coventry Local Access Forum.

NB: This list is not exhaustive and may be subject to change as more information becomes available

Appendix C: Glossary of Construction Activity Terminology

Construction Activity	Full Explanation
Removal of invasive species	Invasive plant species such as Japanese knotweed and Himalayan Balsam will be removed where required and disposed of according to technical standards.
Remediation works	Areas of ground contamination will be removed, and material 'cleaned' on site via a bespoke remediation strategy before being reinstated. This will minimise the risk of contamination compromising deep foundations that will be installed. Remediation works will involve drilling boreholes to monitor groundwater quality and testing the quality of materials prior to reinstatement.
Earthworks and piling platform preparation	Due to a disparity in height of site pre-existing land will be removed, moved by wagons, and reinstated across site to ensure an even surface level. Material of an appropriate specification will then be installed in areas where deep foundation works will be undertaken.
Dewatering	Groundwater encountered during deep foundation works (for example piling) will be pumped out of the excavation to ensure a dry working area can be maintained.
Finishing works and landscaping	After the completion of the civil structures the works area will be landscaped, and key details of the final design will be installed.
Non-intrusive ground investigation	Scanning of the ground throughout the works to monitor underground services and utilities.
Utilities diversion, protection & removal	Utilities will be diverted protect and removed throughout the works to enable HS2 to be constructed.
Piling platform preparation	Pre-existing land is removed and reinstated with material of an appropriate specification to ensure deep foundation works can be undertaken.
Piling	A method of cylindrical deep foundations used to support the structures we are constructing. These structures will be supported by concrete piles which have been drilled metres into the ground.
Sheet piling	A method of piling which involves driving flat steel plates into the ground to reduce groundwater ingress into an area when excavating into the water table. Sheet piles will be installed where deep excavations are required and removed once the works are complete.
Pier construction	Concrete piers will hold up the deck of viaducts and overbridges. These will be cast on site by pouring concrete into formwork which have been fitted out with steel reinforcement.

Appendix D: Reference Document -Berkswell Marsh Key Environmental Sensitive Worksite Management Plan



Contract No. 1MC13

Berkswell Marsh Key Environmentally Sensitive Worksite Management Plan

Document Number: 1MC08-BBV-EV-REP-NS01_NL05-100009

Current Revision	Author	Reviewed By	Approved By	Date Approved	Suitability Status
C03	James Segar	Pamela Cramb	Melanie Knight	07/08/2024	For Acceptance

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Handling Instructions; None

Document Title: Berkswell Marsh Key Environmentally Sensitive Worksite Management Plan Document Number: 1MC08-BBV-EV-REP-NS01_NL05-100009 Revision: C03



Review Required

Team	Yes/No	Name	Position	Date
Quality	No			
Health & Safety	No			
Environment & Sustainability	Yes	Pamela Cramb	Principal Ecologist	07/08/24
Other teams if required	No			

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C01	Charlotte Hammond	Rebecca Sambrook	Melanie Knight	25/09/2023	For acceptance
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Revision Summary

Paragraph Modified	Details of Modification	-9
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Document Title: Berkswell Marsh Key Environmentally Sensitive Worksite Management Plan Document Number: 1MC08-BBV-EV-REP-NS01_NL05-100009 **Revision: C03**

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Introduction 1

Background 1.1

- 1.1.1 The HS2 Environmental Memorandum¹ identifies key worksites along the Phase One route that are environmentally sensitive. These sites are considered particularly environmentally sensitive in relation to the following environmental topics: nature conservation, terrestrial and aquatic ecology, water resources, geomorphology, recreation and amenity, landscape, public open space, and agricultural land. The criterion for their selection is set out in the HS2 Environmental Memorandum.
- 1.1.2 The key environmentally sensitive worksites across Phase One of HS2, from south to north are:
 - Colne Valley;
 - Chilterns Area of Outstanding Natural Beauty (AONB);
 - Bernwood Forest;
 - Radstone and Helmdon Disused Railway; and
 - Berkswell Marsh.
- 1.1.3 The first draft of management plans for key environmentally sensitive Comments and discussions between HS2, its contractors and the Warwickshire Wildlife Trust will be taken into account for updates and amendments" works which may affect them.
- 1.1.4 This Key Environmentally Sensitive Worksite Management Plan (KESWMP) is for the Berkswell Marsh Site of Special Scientific Interest (SSSI). +S2-Ltd Code 1- Accepted

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¹ https://www.gov.uk/governinent/uploads/system/uploads/attachment_data/file/593596/Environmental_Memorandum.pdf

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Berkswell Marsh SSSI in the Context of HS2 1.2

- 1.2.1 Berkswell Marsh SSSI is in the Meriden Gap between Birmingham and Coventry centred on grid reference SP 228798, covering approximately 7.5ha in area. It is a SSSI notified under Section 28 of the Wildlife and Countryside Act 1981. It is identified in the HS2 Environmental Memorandum as being a key environmentally sensitive worksite in relation to the category 'nature conservation, terrestrial and aquatic ecology'. According to Natural England's citation of the designated site², the SSSI has been notified because the marsh forms the largest known example of fen meadow in the West Midlands. The location of the SSSI is shown in Appendix A.
- 1.2.2 The area of fen meadow is bisected by a tributary of the River Blythe (Bayleys Brook, also referred to as Bailey's Brook) and two blocks of wet woodland (Sixteen Acre Wood). Natural England's citation of the designated site shows that the Berkswell Marsh SSSI is in a partly favourable (wet woodland area) and partly unfavourable (wet grassland area) condition, with no change, due to under-grazing.
- 1.2.3 Berkswell Marsh Meadow Local Wildlife Site (LWS) is a large, approximately 8ha, local wildlife site situated on the Berkswell Estate. It contains a series of habitats including various wet and dry grassland types, swamp, scrub and tall herb. Berkswell Marsh SSSI is located to the immediate east of the LWS.
- The Phase One HS2 route runs immediately west of Berskwell Marsh SSSI. A map of 1.2.4 Berkswell Marsh SSSI in relation to the Phase One route is shown in Appendix A. The SSSI is outside the HS2 construction boundary.
- 1.2.5 The Berkswell Marsh SSSI falls within the scope of Environmental Statement (ES) Community Forum Area (CFA) Boundary: CFA 23 Balsall Common & Hampton in Arden and is within the Solihull Metropolitan Borough Council area (SMBC).
- Accepted 1.2.6 It is identified in the HS2 Environmental Memorandum as being a key environmentally sensitive worksite in relation to the following key environmental topic areas:
 - 252 Ltd Code Nature conservation, terrestrial and aquatic ecology; and
 - Water resources and flood risk.

Purpose of the Management Plan

he purpose of this management plan is to: N000-00002

² Natural England, Berkswell Marsh Designation, Accessed from https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1006055.pdf

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- Identify works potentially affecting Berkswell Marsh SSSI from contractors and third parties in relation to HS2;
- Focus on mitigation, compensation and monitoring requirements and opportunities for enhancement in relation to specific environmental topics; and
- Identify synergies between different stakeholder organisations in terms of opportunities.
- 1.3.2 This management plan has been prepared to satisfy the commitments set out within the HS2 Environmental Memorandum and to support the Local Environmental Management Plan (LEMP) for Solihull Metropolitan Borough Council area. The management plan is part of a suite of documents which identify environmental issues, controls and opportunities in relation to the Berkswell Marsh SSSI including:
 - The Environmental Minimum Requirements which contains the Code of Construction Practice (CoCP) and the HS2 Environmental Memorandum;
 - Schedule 17 controls under the HS2 Act 2017 (the Act). Key Environmentally Sensitive Worksite Management Plans (KESWMP) will support Schedule 17 submissions and Town and Country Planning Applications within the Berkswell Marsh SSSI and where appropriate, heritage applications under Schedule 18, 19 and 20;
 - Protective provisions. The Act also contains provisions which give protection to bodies affected by the scheme. These include highway authorities, utility undertakers, the Environment Agency (EA), the Canal and Rivers Trust, and harbour and airport authorities. Typically, these provisions enable HS2 Contractors to undertake works affecting their infrastructure but require approval of the details to be obtained. Paragraph 12 of Schedule 31, Part 1 of the Act requires the nominated undertaker not to deposit soil or material, or store any plant, or erect scaffolding or other structures, in or over a highway without the consent of the highway authority;
 - Legally binding consenting and licensing process. HS2 Limited will be submitting licences and consents in accordance with the Schedules of the Act; and
- This document for information purpose of the Act; and The Environmental Management Systems implemented by HS2 Contractors (as defined in the CoCP) including contract level and site level environmental management plans.

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- 1.3.3 There is a commitment in the document Warwickshire, Coventry and Solihull Local *Biodiversity Action Plan (Draft Generic Habitats) 2014*³ achieve a number of objectives including the following:
 - Maintain the condition and current extent of habitats, giving priority to those holding UK Biodiversity Action Plan Priority Species & Red Data Book species;
 - Promote good management practice and improve habitat condition • to maximise the biodiversity value of habitats, using agri-environment schemes where appropriate;
 - Identify potential projects for which resources and funding can be • sought, using partnership working opportunities to gain multiple benefits through a variety of capital schemes and engaging with the development and planning process to deliver outcomes; and
 - Increase public appreciation of local habitats and promote their importance for wildlife, including the provision of information.
- 1.3.4 This management plan supports these objectives, and HS2 and its Contractors will also aim to seek opportunities for shared delivery.
- 1.3.5 This management plan is a 'live document' and will be reviewed whenever there is a significant change to works proposed in line with the revision of the Local Environmental Management Plans (LEMPs). This KESWMP was first produced by LM Joint Venture (a joint venture between Laing O'Rourke and J. Murphy & Sons) as a first draft and was submitted to the National Environment Forum (NEF) for consultation. The It has since been revised by BBV (a joint venture made of Balfour Beatty Group Ltd, VINCI Construction Geoinfrastructure, VINCI Construction UK Ltd and VINCI Construction Terrassement) and will continue to be reviewed and ccepter updated accordingly in line with the revision of the LEMP for Solihull Metropolitan Borough Council.

1.4 Process of Developing the Management Plan

1.4.1 On 16 November 2016 contracts were awarded to three Enabling Works Contractors (EWC) working across Phase One of HS2. Area North covers an area of the Phase One route from Kineton Road, Southam in Warwickshire to Streethay in Lichfield and the EWC covering Area North was the LM Joint Venture.

ACO8-BEZEV-PL N-N000-000025 The EWC contract in Area North completed their final works in July 2023.

acceptance or implementatic tion purposes only and to embedded within ³ Warwickshire, Coventry & Sofffull Local Biodiversity Action Plan (LBAP) | Warwickshire Wildlife Trust
- 1.4.3 On 17 July 2017 contracts were awarded for HS2's Main Works Civils Contractors (MWCC). The MWCC covering the Berkswell Marsh area is BBV. The MWCC were given notice to proceed with the construction of HS2 on the 15th April 2020.
- 1.4.4 All HS2 Contractors are working collaboratively, along with relevant third parties such as utilities companies, Berkswell Estate and Cemex, in relation to works within or within the locality of the Berkswell Marsh SSSI, which may have a direct or indirect effect on the SSSI.
- 1.4.5 This management plan is based on current timescales and is intended to be reviewed prior to any construction works that may impact indirectly upon the SSSI, whenever there is a significant change to works proposed in line with the revision of the LEMPS or on a six-monthly basis, whichever is soonest. Updates of publication will be in line with publication of the LEMP.

1.5 Consultation

- 1.5.1 Natural England were initially consulted on the works in relation to the Berkswell Marsh SSSI at a meeting on the 8th of November 2018. Any relevant assents for indirect impacts on the SSSI for ground investigation and construction works are being applied for in line with the works programme when required, with the most recent assent being granted in October 2022. No works are taking place within the boundaries of the SSSI and therefore there is no need for consultation with Natural England with regards to direct impacts on the SSSI.
- 1.5.2 The National Environment Forum (NEF) (comprising the agencies Historic England, EA, Natural England and the Forestry Commission) members and Solihull Metropolitan Borough Council will be consulted on the KESWMP following requirements within the HS2 Environmental Memorandum.
- 1.5.3 Copies of the updated plan will be made available for consultees by email. Comments from the consultees will be collated for consideration of further updates and amendments. Comments and discussions between HS2, its contractors and the Warwickshire Wildlife Trust will also be taken into account for updates and amendments."
- This document has been 1MCOB-BBV-EV-PL N-N000-00006deed for information ninfores noise noise and is r his 1.5.4 Following the Environmental Memorandum commitments, the management plan MUCUS-USV-EV-FLANUUL-UUUSS for information purposes only and is not will be submitted with relevant Schedule 17 submissions to local planning authorities and, where appropriate, heritage applications.

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Overview of works in the vicinity of 2 the Berkswell Marsh SSSI

2.1 **Enabling Works**

2.1.1 LM carried out a range of survey and investigation works which commenced in October 2017. Vegetation clearance commenced in 2018 and LM also carried out construction works including the provision of early ecological mitigation sites.

2.2 Surveys

- 2.2.1 A range of survey and investigation works were undertaken within the vicinity of the Berkswell Marsh SSSI during the Enabling Works period.
- 2.2.2 Works included environmental surveys such as ecological surveys, groundwater monitoring and surveys to support hydrological modelling. There were also surveys to identify invasive species, such as Japanese knotweed, to support plans for future treatment and control; and,
 - Engineering surveys, including soil surveys;
 - Construction of ecological mitigation sites;
 - Design and construction of advanced planting sites; and
 - Utility diversions.
- 2.2.3 Further surveys have continued to be carried out by MWCC as required as the design of nearby assets develops.

2.3 Site Clearance and Fencing

ccepted Site clearance works in the vicinity of the SSSI were undertaken by Enabling Works 2.3.1 including vegetation removal, tree protection and removal, soil storage and soil stripping, fencing and utility protection. Works also included installation of watercourse crossing points, compound access points and compound hard standings.

2.3.2 information purpos acceptance or imple

The Enabling Works originally considered within this plan also involved the construction of post and wire fencing on the boundary of the scheme. This included 2,400m of post and wire fencing that intersected the Berkswell Marsh Meadow LWS. The closest section of fencing to the Berkswell Marsh SSSI was installed 8m from the site and for approximately 55m along the boundary. It was intentionally sited to and is not entation nin

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> avoid intersecting the notified boundary of Berkswell Marsh SSSI. For clarity, no works were undertaken in the SSSI.

- 2.3.3 Vegetation clearance was also undertaken by LM and included the clearance of approximately 2,700m² of scrub, tree and tall ruderal vegetation within the LWS.
- 2.3.4 There has been approximately 29,750m² of vegetation clearance within Sixteen Acre Wood, which forms part of a potential Local Wildlife Site (pLWS): Berkswell Hall Wood pLWS, to the south and east of Berkswell Marsh SSSI. This pLWS has not yet been fully notified, and an assessment in 2001 found that it would not likely qualify as a LWS on botanical grounds but may qualify on ornithological grounds. Post and wire fencing was installed as part of the clearance works. This includes 350m of fencing that intersects the pLWS as it follows the scheme boundary.

2.4 **Ecology Mitigation Sites**

- 2.4.1 Two ecological mitigation sites have been constructed as mitigation for the loss of habitat (outside the SSSI) due to the construction of HS2. The ecological mitigation sites have been assigned objectives and have been designed with the intention of maximising the potential quality of the available habitat on each site. Each site has bespoke maintenance, management and monitoring requirements to achieve the ecological objectives of that site (confirmed in the Ecological Site Management Plans (ESMPs) of each site). More detail on these mitigation sites is provided in Section 3.1.
- 2.4.2 Mitigation site SD26 (Sixteen Acre Wood) was added to the EWC scope to fulfil the requirement to provide habitat for great crested newts 'Triturus Cristatus' (GCN). Ponds with excavation depths of 1.75m were constructed on land that had been Accepted used as pasture. The construction was undertaken in a sensitive manner, including protection of adjacent trees to be retained.

2.5 Main Construction Works

2.5.1 In relation to the design and delivery of the Main Works, the London-West Midlands Environmental Statement Volume 2 Community Forum Area Report 23 (HS2, 2013⁴) stated that the land required to construct the proposed scheme has been designed to avoid the loss of marshy grassland at Berkswell Marsh SSSI. idocument has been embed 1d

⁴ London-West Midlands EN VIRONMENTAL STATE MENT. November 2013. Volume 2 | CFA 23 Balsall Common & Hampton-ination 'is not Arden.

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- 2.5.2 MWCC works comprise (but are not limited to) the construction of:
 - a 400m embankment known as the Marsh Farm Embankment;
 - a 150m long viaduct known as Marsh Farm Viaduct;
 - a 2.1km cutting known as Park Lane Cutting;
 - A452 Realignment;
 - Hornbrook Cutting; and
 - Modification of floodplain storage.
- 2.5.3 As main works design and construction develops further, this KESWMP will be revised in line with the LEMP for Solihull Metropolitan Borough Council to reflect any changes to anticipated impacts to the SSSI and to detail any further mitigation which may be required.

2.6 Ground Investigation (GI)

- 2.6.1 Enabling Works undertook cone penetration testing and dynamic probing in the Berkswell Marsh Meadow LWS by Soil Engineering Ltd in 2018 to inform the design of the Marsh Farm Viaduct embankment close to this this location.
- 2.6.2 The closest operational GI location to the SSSI is a borehole 40m to the southwest. There have been trial pits and cone penetration tests undertaken approximately 15m south of the Berkswell Hall Wood pLWS. The geology between the SSSI and these GI locations is contiguous and the monitoring was sited in locations that would allow the groundwater beneath the SSSI to be modelled, assessed for potential effects and monitored during construction.
- 2.6.3 The geoenvironmental findings of the ground investigation for Berkswell Marsh identified that the site is located across river terrace/alluvium superficial deposits overlying glaciofluvial deposits. From the BGS and the EA the aquifer is considered Secondary undifferentiated, unconfined aquifer connected hydraulically with the Bayleys Brook.
- 2.6.4 BBV have carried out a ground investigation across Area North between 2021 and 2023, by installing monitoring wells in the area. Borehole ML152-CP406 is the closest of these and is within a field adjacent to Berkswell Marsh SSSI (i.e., not within the SSSI). A SSSI assent from Natural England has been provided and updated as necessary to cover any variations on timings of the works.

² 2.6.5 Data collected during groundwater monitoring is compared to baseline information collected during ground investigation to monitor for potential impacts to the SSSI. A Construction Phase Groundwater Risk Assessment undertaken for Marsh Farm Viaduct, found nitrate to be high due to being the location being part of a Nitrate

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Vulnerable Zone. Groundwater levels are also monitored to understand any risk fluctuances due to abstraction works in A452 Realignment, Hornbrook Cutting and Marsh Farm Viaduct.

2.6.6 Monthly monitoring of surface water quality in Bayleys Brook has been carried out since 2021 and no impacts on water quality have been identified. Stilling wells are in situ in Bayleys Brook near to Marsh Farm.

2.7 Third Party Works (Utilities)

2.7.1 An existing gas pipeline (HP11), situated immediately downstream of Berkswell Marsh SSSI (outside of the SSSI boundary) was diverted in 2020 by Cadent Gas. The pipeline is a single gas pipe approximately 36" in diameter and 1.8km in length. The works included construction and installation of the pipeline via open cut technique, except for the section that crosses under the proposed HS2 track and extending beyond Bayleys Brook outside the boundary of the SSSI, which was tunnelled.



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3 Environmental Topics

3.1 Nature Conservation and Ecology

Impacts

3.1.1 No works, clearance or fence installation will occur within the SSSI, therefore, no direct effects on the ecological status of the SSSI have occurred or are anticipated.

- 3.1.2 The Berkswell Marsh SSSI is outside the consolidated land boundary (comprising of the Limits of Land Acquired for Use and Limits of Deviation), but borders the corridor of a pipeline diversion route, which is downstream of the SSSI (as described above in section 2.7.1). The Berkswell Marsh SSSI is referenced in the ES (as amended) (Volume 2, CFA23 Balsall Common and Hampton-in-Arden, Section 7.4.6) and states that "there are no works proposed within Berkswell Marsh SSSI and works to divert the gas main adjacent to the SSSI are not anticipated to have an adverse effect on site integrity." The works to diver this pipeline have been were completed in 2020 and resulted in no impacts to the SSSI.
- 3.1.3 There is potential for noise and vibration disturbance to result from construction works, however this is not expected to result in significant effects on Berkswell
 Marsh SSSI owing to the lack of ecological features sensitive to noise and vibration.
- 3.1.4 Vegetation clearance southeast of the Berkswell Marsh SSSI crossed a tributary of the River Blythe (Bayleys Brook) at Lavender Hall Lane. This area of vegetation clearance was 1km upstream of the SSSI but not effects to water chemistry resulted from the works.
- 3.1.5 The SSSI will be protected in line with pollution prevention guidelines (section 5.12 of the Environmental Minimum Requirements Annex 1: Code of Construction Practice). Any future works with potential hydrological connectivity to the SSSI will be undertaken under an appropriate method statement that enacts the CoCP guidelines.
- 3.1.6 The environmental assessment assessed the effects of increased surface water runoff following vegetation removal to be minimal. Compliance with the Code of Construction Practice (CoCP) during and following vegetation removal has ensured that there has been no alteration to overland flow paths.

Standard construction control measures specific to the locality have been outlined Standard construction control measures specific to the locality have been outlined in Table 1 of the Solihull Metropolitan Borough Council Local Environmental Management Plan and support the ecological mitigation as specified in the

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> Environmental Statement⁵ (ES). The mitigation measures outlined in the HS2 ES proposed scheme maps (CT-06-101 to 104) include for the creation of mitigation sites, which have been targeted specifically to mitigate environmental impacts of enabling works and will be managed in the long term for biodiversity.

- 3.1.8 Method statements and construction management plans have been implemented to ensure the environmental effects associated with works are identified, planned for and managed in addition to those identified in the relevant consents and licences. BBV and HS2 assure that these controls are being implemented through regular site visits, inspections and audits.
- 3.1.9 Approximately 7,500m² of replacement compensatory neutral grassland planting near Berkswell Marsh SSSI will be provided adjacent to Sixteen Acre Wood Embankment to mitigate for neutral grassland lost from Berkswell Marsh Meadow Local Wildlife Site during construction of the proposed scheme. Maintenance and management of the mitigation sites will be specified in ESMPs, on which the relevant stakeholders will be invited to comment, through an ongoing process.
- 3.1.10 The vegetation removal within the Berkswell Hall Wood pLWS and Berkswell Marsh Meadow LWS will permanently alter the form of the designations. The vegetation removal will affect <5% of the designated boundaries, which has been consented under the HS2 Act under the condition that no net loss to biodiversity will occur.
- 3.1.11 Two outlier badger setts within the part of Sixteen Acre Wood that require clearance will need to be closed under licence. If vegetation clearance is required before the setts can be closed, it shall be done under the precautionary method of works so as not to damage or obstruct the setts. The setts will be closed under the HS2 ell Accepter organisational licence (WML-OR24), in accordance with WP 054 - EWCBMS25 - Park Lane-Method Statement / Detailed Design for Works under HS2 Organisational Badger Licence. These measures are not anticipated to affect the SSSI.
- 3.1.12 Two ecological mitigation sites have been constructed in the vicinity of Berkswell Marsh and the locations of these sites are shown in Figure 1.

document has been embedded with

⁵ London-West Midlands ENVIRONMENTAL STATEMENT. November 2013. Volume 4 | Off-route effects.

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Figure 1 - Location of nearby Eco Mitigation Sites

- 3.1.13 Sixteen Acre Wood Mitigation Site, SD26, was primarily designed to provide habitat replacement and enhancement for GCN and includes additional habitat enhancements for landscape integration and habitat connectivity purposes. The site aims to ensure the Favourable Conservation Status of the GCN population in the local area and involved the creation of two mitigation ponds, associated marginal and aquatic planting and enhancement of existing poor, semi-improved grassland.
- 3.1.14 The construction of the SD26 mitigation site was a sufficient distance from the SSSI so as not to cause undue adverse effects. The target depth of excavations for ponds are relatively shallow and do not affect the hydrology of the SSSI.
- 3.1.15 SD177 is an ecological mitigation site in what is known as the Park Lane Cluster of mitigation sites. The site encompasses the management and enhancement of 6.1%ha of existing semi-natural broadleaved woodland in which measures have been undertaken to provide compensation for the loss and severance of habitat across the scheme. Measures undertaken include the creation a honeysuckle hedgerow, to provide nectar-rich plants for invertebrates, the installation bat boxes, the management of invasive plant species in order to:
 - Manage use mean Moon of the provided Manage the habitat for bat foraging, commuting and roosting,

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Document Title: Berkswell Marsh Key Environmentally Sensitive Worksite Management Plan Document Number: 1MC08-BBV-EV-REP-NS01 NL05-100009 **Revision: C03**

> Manage scrub and tree species producing fruit and nuts to provide foraging habitat for badgers.

Monitoring Requirements

- 3.1.16 Monitoring requirements for protected and other species, and habitats, are determined through the HS2 Ecological Monitoring Strategy, informed by the routewide licences and through the ESMPs for ecological mitigation sites adjacent to the SSSI. No ecological monitoring is proposed within or related to the SSSI as no impacts to the hydrology or ecology of the SSSI are predicted.
- 3.1.17 The site-specific ESMPs for the mitigation sites adjacent to the SSSI will be consistent with the requirements of the HS2 Environmental Memorandum on management and monitoring (Section 4.8). Section 4.8.6 states:

"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 depend on which management option is adopted for a particular area of habitat and will be agreed on a sitespecific basis."

Opportunities for Enhancement

3.1.18 Enhancement opportunities have been considered within the design and construction process and include such opportunities as additional swales for the habitat mitigation sites and placement of reptile banks and hibernacula outside of the floodplain, or other areas at risk.

Water Resources and Flood Risk 3.2

Impacts

3.2.1 No works are scheduled to take place within the boundary of the SSSI. Consequently, there are no anticipated direct impacts to Berkswell Marsh SSSI on water resources and flood risk from the activities undertaken for the works. However, works carried out upstream and downstream of the SSSI have the potential to indirectly impact the SSSI, therefore all works are to be carried out under CoCP guidelines, and NE will be consulted with where necessary.

3155V-EV-PLN-NOO0-000025 mation purposes of 1 and is not Works that have occurred and were considered to be relevant to water resources ^r ^{IIII}UITIAIIUTI PUIPUSės UTIY ATIO ACCeptance or implementation has and flood risk are:

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- Soil storage and soil stripping (as required), for example within areas designated for compounds, soil will be stripped and stockpiled for storage;
- Construction of crossing points over watercourses (as required) by the vegetation clearance contractor; and
- Modification of floodplain storage upstream and downstream of the SSSI.
- 3.2.3 The post and wire fencing surrounding the perimeter of the vegetation clearance sites could potentially contribute to an increase in flood risk, which may influence distribution of marginal plant species at the Berkswell Marsh SSSI. However, this risk is considered to be small due to the small change in capacity caused by the fence and due to the marsh largely being fed by groundwater sources.
- 3.2.4 Berkswell Marsh SSSI is understood to comprise a combination of wet grassland and wet woodland habitats. Data obtained from GI works indicates that the groundwater table is several metres below the base of the planned cutting. It is therefore unlikely that the scheme will impede or intersect groundwater during construction i.e., no dewatering is anticipated. As a result, it is considered that based on the current scheme design, the potential impacts to both groundwater quantity and quality inflowing to Berkswell Marsh SSSI are low.

Mitigation

- 3.2.5 Works are partially located within areas of Zone 2 and Zone 3 Flood Risk associated with the floodplain of Bayleys Brook, which is an ordinary watercourse that flows through the SSSI. Consequently, the design works must incorporate a flood risk assessment, or a flood risk compliance form regarding any deviation from the HS2 ES flood risk assessment, as outlined in HS2 Technical Standard for Water Resources and Flood Risk Consents. For HS2 works, an approval will be required from the Lead Local Flood Authority (LLFA) or Internal Drainage Board (IDB). In addition, a Water Framework Directive (WFD) assessment (or completion of a compliance form) is also required as the works may impact on a SSSI, as outlined in the HS2 technical standard referenced above.
- The area has been subject to vegetation stripping and the creation of associated soil 3.2.6 storage stockpiles. Any watercourse crossings that are planned have been subject to the required Schedule 33 Part 5 consents, i.e. flood defence consents from the Environment Agency, and associated surveys and monitoring as and when required MCOB-BBV-EV-PL as part of ongoing obligations. Where applicable, Natural England have and will be for information purpos consulted, with SSSI assents being obtained where necessary for works to continue. acceptance or imple Any works will be carried out with control measures in place to prevent the deterioration in surface water and groundwater quality entering the SSSI via Bayleys Brook, this includes measures to mitigate for flood events. Soil Resource Plans will nentation and is not Nithin

> set out the management measures required for soil stockpiles to prevent deterioration in surface water quality.

- 3.2.7 MWCC works comprise (but are not limited to) the construction of a 400m embankment known as the Marsh Farm Embankment, and a 2.1km cutting known as Park Lane Cutting. Park Lane Cutting crosses Bayleys Brook on two occasions upstream of the SSSI. The design for the cutting will account for the need to control rainfall and surface runoff in addition to any inflows due to groundwater seepage. Construction design will conform with CoCP guidelines and consider control measures to minimise the impact of contaminants entering the watercourse such as the accidental spillages/discharges and the mobilisation of sediment.
- 3.2.8 A perimetral ditch has been installed along the side of the HS2 trace to manage surface water runoff from site.

Monitoring Requirements

- 3.2.9 Groundwater monitoring is ongoing as mentioned in Section 2.6.2. The implementation of agreed monitoring will be underpinned by the relevant consenting process.
- 3.2.10 The purpose of groundwater monitoring is to establish whether HS2's nearby works have the potential to affect groundwater discharge to the SSSI, which is a key component of its water balance. Following the establishment of baseline conditions, it is anticipated that monitoring will continue through the construction phase in order to identify any issues and requirements for mitigation.
- 3.2.11 Monitoring of the sites for flood incursion will be undertaken as part of the ongoing monitoring of all the sites. This will continue to be carried out during the main works phases.
- 3.2.12 Monitoring for groundwater levels and quality will be carried out at the scheduled borehole located adjacent to the SSSI. The monitoring program (scope, parameters, frequency and duration) will be agreed between MWCC, EA, HS2 and Natural England.

Opportunities for Enhancement

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Opportunities for further enhancement will be identified through ongoing ILUB-BEV-EV-FLIV-IVUUU-UUUS INFORMAtion DUIPOSES account-ance or implementation and is not ^{- יייז}יטיזי^{ים}ייטיז בעזיבט ביייטי ^{ACCeptance} or implementation consultation with the EA and LLFA, including opportunities to implement flood risk reduction and the principles of natural flood management.

3.2.13

3.3 Noise, Vibration and Dust

- 3.3.1 There is potential for noise and vibration disturbance to occur resulting from the machinery used. This is not expected to result in significant effects on Berkswell Marsh SSSI due to the lack of ecological features sensitive to noise and vibration. The nearest dust, noise and vibration monitors are located at Marsh Farm and to date there have not been any exceedances.
- 3.3.2 In addition, it was noted that dust emissions may arise from the demolition of one building, earthworks, construction, and the use of haul routes to and from the sites at locations adjacent to receptors including Berkswell Marsh SSSI. Compliance with the CoCP and appropriate site management is required to mitigate these impacts including dust monitoring during construction, which is covered in the LEMP for Solihull Metropolitan Borough Council.

3.4 **Agriculture and Soils**

3.4.1 Topsoil stripping has not and will not take place within the Berkswell Marsh SSSI. Where compound access and hardstanding is necessary outside the SSSI, topsoil clearance will be in accordance with CoCP guidelines and species licence method statements. New packages of BBV civil engineering and highway works will be reviewed and assessed for any impacts on the nature conservation, terrestrial or aquatic ecology and appropriate mitigation and compensation requirements implemented.

3.5 Summary

- 3.5.1 Ecological constraints, nature conservation, ground and water resources and flood *ccepted* risk have been assessed and opportunities for enhancement within the SSSI area will be identified in future.
- 3.5.2 MWCC are not directly impacting the SSSI with works. Consultation with Natural England has taken place where indirect impacts may occur during works, and this \sum will continue going forward.
- The KESWMP will be reviewed and revised as appropriate or on a six-monthly basis 3.5.3 This document has been embedded for information nurooses only and is r 3 document has been embedded within by HS2 and its Contractors, whichever occurs soonest. 1521td MCU& & V-V-VLN-NUUCUUUS for information purposes only and is not

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Appendix A: Berkswell Marsh SSSI in relation to the Phase One route



Figure 2 : Location of Berkswell Marsh SSSI to HS2 Infrastructure



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