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1 Introduction

1.1.1 This Local Environmental Management Plan (LEMP) sets out site specific control measures to be adopted by CSjv and other HS2 Contractors working within the London Borough of Ealing (LBE). 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://www.gov.uk/government/uploads/system/uploads/attachment_data/file/593592/Code_of_Construction_Practice.pdf).

1.1.2 This LEMP contains control measures and standards to be implemented within LBE. 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, air quality monitoring, 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 LEMPs
1.1.5 This LEMP has been prepared taking into account findings of the Environmental Statement (ES), Supplementary Environment Statement (SES) and Additional Provision 2 ES (AP2 ES) and the SES2 and AP3 ES 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 Forum, 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 will be certified to BS EN ISO 14001.

1.1.7 The nominated undertaker (HS2 Ltd)\(^1\) 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.

1.1.8 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\(^2\) members) is generated in any of the environmental topics’ as mentioned above. There are currently no such sites identified in Ealing.

1.1.9 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.

1.1.10 HS2 documents referenced within this LEMP can be found on the www.gov.uk website.

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\(^1\)HS2 Ltd is the nominated undertaker. The two terms are used interchangeably throughout this LEMP.

\(^2\)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
1.2 **Area and Scope**

1.2.1 Plans showing an overview of the local authority area covered by this LEMP are shown within the Environmental Statement (ES) maps (CFA4 Volume 2 Map Books ES Ref 3.2.2.4) – CT-05-009b, CT-05-009b-R1, CT-05-009b-L1 - and (CFA5 Volume 2 Map Books ES Ref 3.2.2.5) - CT-05-010b, CT-05-011, CT-05-012, CT-05-013, CT-05-014 and CT-05-015a.

1.2.2 Construction worksites and areas required for construction works are shown within the CT-05 maps. The following construction compounds will be located in LBE:

- Westgate vent shaft main compound;
- Mandeville Road vent shaft main compound;
- Greenpark Way vent shaft main compound;
- Victoria Road crossover box main compound;
- Victoria Road tunnel drive main compound;
- Willesden Euro-terminal main compound;
- Old Oak Common Great Western Main Line satellite compound;
- Old Oak Common Lane underbridge satellite compound;
- Central Line bridge satellite compound; and
- Atlas Road satellite compound.

1.2.3 It is anticipated that the following general descriptions of work activities will take place during the construction period within this local authority boundary:

- Ground investigation and associated environmental surveys.
- Advance works including: site investigations further to those already undertaken; preliminary mitigation works; preliminary enabling works; utility diversions; and highway improvements; noise insulation.
- Civil engineering works, including: establishment of construction compounds; site preparation and enabling works; main earthworks; ground remediation; and structure works.
- Construction of tunnels by tunnel boring machine (TBM).
- Construction of vent shafts and head houses at Westgate vent shaft, Mandeville Road vent shaft, Greenpark Way vent shaft and Victoria Road crossover box.
- Railway installation works, including: establishment of construction compounds; railway infrastructure installation; fit-out of tunnels, vent shafts or other buildings; connections to utilities; changes to the existing railway network; and
- Railway testing and commissioning.
1.2.4 The Main Works Civils Contractors (MWCC), Skanska Costain STRABAG (SCSJV) Railways will be undertaking a suite of ground investigation works in advance of the main works construction phase in the following areas:

- Westgate Ventilation Shaft.
- Greenpark Way Ventilation Shaft.
- Mandeville Road Ventilation Shaft.
- Lyon Way.
- 14 & 18 Wadsworth Road.
- Green Park Vent Shaft to Mandeville Vent Shaft (Belvue).
- Victoria Road to Westgate Ventilation Shaft.
- Park Royal Travelodge.
- Wendover Court.
- Stanford House.
- Sheraton Business Centre.
- Rockware Avenue.
- Old Oak Common – Victoria Road / Atlas Road.

1.1.1 The requirement for this Ground Investigation work is to inform detailed design and will include but is not limited to:

- Survey Control Network.
- Geospatial Monitoring.
- Topographical Surveys.
- Utility Surveys.
- Condition Surveys.
- Obstructions.
- Temporary Works.

1.2.5 The scope of the ground investigation works is not fixed and is subject to change during the works. No construction compounds are required as part of the Ground investigation works.

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 LBE. The measures described will be applied by the CSjv and other HS2 Contractors throughout the construction period to reduce the potential environmental and community impacts within LBE during construction.
2.1.2 The nominated undertakers Contractors will develop the 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

5.1.1 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, as detailed in sections 5.2 to 5.16 below.

5.2 Community Relations

5.2.1 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.

5.2.2 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.

5.2.3 The local area plan will take account both of distinct geographic distribution of the communities in LBE and will involve the Contractors and any relevant third parties and stakeholders, for which there will be co-ordination arrangements.

5.2.4 Ongoing engagement with local interests and community groups will occur during construction, as listed in Appendix 2 of this LEMP. (NB: This list is indicative and will be subject to change as more information becomes available.)

5.3 **Advanced Notice of Works**

5.3.1 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.

5.4 **Working Hours**

5.4.1 The framework for seeking consent for working hours under Section 61 of the Control of Pollution Act 1974 is set out in the CoCP.

5.5 **Core Working Hours**

5.5.1 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.

5.5.2 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 the productivity within the core working hours, the 1hr start up and close down periods will include activities such as deliveries, workforce arrival/departure,

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3 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, and utility companies such as Thames Water and National Grid.
unloading, maintenance and general preparation works etc. 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 LBE. Emergencies (not repairs and maintenance) may be undertaken outside core hours.

5.5.3 Certain work activities at specific locations within the local authority area will need to take place outside of the core working hours for safety and engineering purposes. 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:

- Surveys and some internal soft strip activities.
- Ground investigation works.
- Continuous tunnelling operations around Old Oak Common Main Compound, Victoria Road Tunnel Drive Compound, Victoria Road Crossover Box Main Compound, Willesden Euro-terminal Sidings Main Compound and Great Western Main Line Main Compound.
- Major civil works such as piling, diaphragm walls and major concrete pours during extended hours at Old Oak Common station main compound and Victoria Road crossover box main compound.
- Continuous operation of conveyors, pumping equipment and essential generators at Old Oak Common station main compound, Victoria Road crossover box main compound and Willesden Euro-terminal main compound.
- Movement of trains into and out of the sidings during the day, evening and night from the Willesden Euro-terminal main compound.
- Loading and movement to site of tunnel lining segments at Atlas Road satellite compound and Victoria Road crossover box main compound; and
- Surface activities associated with construction of short connections between the shaft and the main tunnel at the Westgate and Mandeville Road vent shaft sites.

5.5.4 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 work to be carried out during core working hours where stipulated clearance can be met. 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.
5.5.5 Road Rail Vehicles (RRVs)\(^4\) 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.

5.6 Construction Site Layout and Good Housekeeping

5.6.1 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.

5.7 Site Lighting

5.7.1 All construction sites will be lit in accordance with the requirements of the CoCP as detailed within Section 5.4 and approval of site lighting in Schedule 17 Part 1 of the High Speed Rail (London – West Midlands) Act (the Act).

5.7.2 Site lighting will be designed to avoid light pollution to surrounding buildings, ecological receptors, local residents, railway operations, passing motorists and other sensitive land uses, where reasonably practicable.

5.8 Worksite Security

5.8.1 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.

5.8.2 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.

5.8.3 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 and plant machinery will be securely locked away and immobilised each night. Securing sites will involve the use of physical, electronic and human resources in a proportionate and cost effective manner.

5.8.4 In some situations, particularly in an urban setting within the LBE, consideration will be given to extra visibility for the public and workforce at night, e.g. use of half-

\(^4\)A vehicle which can operate both on rail tracks and road, often used for railway maintenance.
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.

5.8.5 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.

5.9 Hoardings, Fencing and Screening

5.9.1 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. CSjv are in the process of designing the site setup for the sites in LBE.

5.9.2 Hoardings up to 3.6m high will on occasions, be used to control construction noise. Specific hoarding heights in LBE will be included in this LEMP as and when the hoarding designs are finalised. Such taller screening will be considered along the edges of the following construction site boundaries:

5.9.3 Greenpark Way vent shaft site, adjacent to the Greenford Mail Centre, and alongside residential communities on Conway Crescent, Perivale; and

5.9.4 Old Oak Common main compound, adjacent to residential communities at Wells House Road, Wales Farm Road, Shaftesbury Gardens, Midland Terrace, Victoria Road, Bashley Road, Old Oak Common Lane and Stephenson Street. At locations where existing fencing may need to be removed a suitable alternative will be used.

5.9.5 Where there are earthworks along the track, 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.

5.9.6 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.
5.10 **Unexploded Ordnance**

5.10.1 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.

5.11 **Electromagnetic Interference**

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

5.12 **Temporary Living Accommodation**

5.12.1 There will be no temporary living accommodation for construction workers in LBE.

5.13 **Occupational Healthcare**

5.13.1 The nominated undertaker will ensure there is provision for either access to on-site or near site occupational healthcare for site workers, as detailed within Section 5.10 of the CoCP.

5.14 **Clearance and Re-instatement of Sites on Completion**

5.14.1 This will be carried out as detailed within Section 5.11 of the CoCP.

5.15 **Pollution Incident Control and Emergency Preparedness**

5.15.1 The Contractor's pollution incident control and emergency preparedness plan(s) will have due regard to local receptors as detailed in Sections 6 to 16 of this LEMP.

5.15.2 The Contractors has considered measures and processes to be implemented in the event of environmental non-conformances.

5.16 **Local Control Measures**

5.16.1 The Contractors’ pollution incident control and emergency preparedness plan(s) 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, and
- The use of oil interceptors at site offices and work compounds.
• Regular spill training will be carried out with relevant site staff.

5.17 **Fire Prevention and Control**

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

5.18 **Extreme Weather Events**

5.18.1 The Contractors’ pollution incident control plan 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.

5.19 **Carbon Management Plans**

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

5.20 **Interface Management between Adjacent Construction Areas**

5.20.1 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**

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

6.2 **Sensitive Receptors**

6.2.1 There is no agricultural land likely to be affected within Ealing.

6.3 **Local Control Measures**

6.3.1 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 an appropriate management regime.

6.3.2 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 bio-security and reduce the risk that invasive non-native species and diseases are spread as a consequence of the project. Further details are provided in the CoCP.

7 **Air Quality**

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 practice”

7.2 **Sensitive Receptors**

7.2.1 The Contractors’ 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.

7.2.3 The construction works within LBE have been assessed to determine the risk of impacts due to construction dust. The areas surrounding construction works have been classified as ‘low’, ‘medium’ and ‘high’ risk using the Institute of Air Quality Management (IAQM) methodology, in relation to emissions of dust from construction and demolition activities. The following sites within LBE have been

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5 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
Guidance on the assessment of dust from construction and demolition: Institute of Air Quality Management (IAQM), February 2014
classified as ‘high risk’ as defined by IAQM and appropriate mitigation will be employed:

- Old Oak Common: sensitive receptors are mainly residential properties along Wells House Road. Receptors also include properties on Old Oak Common Lane, Shaftsbury Gardens and Midland Terrace.
- Victoria Road and Chase Road tunnel drive site: sensitive receptors are mainly residential properties along Wells House Road, Midland Terrace, Chandos Road and School Road.
- Makro Atlas/Willesden Euro-terminal: sensitive receptors are mainly residential properties along Stephenson Street and Goodhall Street; and
- Mandeville Road vent shaft: sensitive receptors are mainly residential properties along Carr Road and Badminton Close.

7.2.4 Receptors affected by emissions from anticipated construction traffic are mainly along A40 Westway/Western Avenue, A400 Old Oak Lane and Old Oak Common Lane.

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. In LBE the key measures will include compliance with required vehicle and Non-Road Mobile Machinery (NRMM) emission requirements; damping down of dust-generating equipment and vehicles within the site and the provision of dust suppression measures in all areas of the site that are likely to generate dust; measures to keep roads and accesses clean; covering materials, deliveries or loads entering and leaving the construction site by road and rail; buildings or structures to be demolished will be sprayed with water or screened as necessary, prior to and during demolition the enclosure; shielding or provision of filters on plant likely to generate dust beyond the site boundaries; the use of diesel or petrol-powered generators will be reduced by using mains electricity or battery-powered equipment where reasonably practicable.

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 Contractors 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.

7.3.4 For the LBE the relevant category of vehicle emission standard is the London Low Emission Zone. Within the London Low Emission Zone there are requirements for heavy road vehicles to be powered by EURO VI (or cleaner) engines and for cars and vans to be Euro 6 diesel and Euro 4 petrol. There are also targets for the use of Ultra Low Emission Vehicles. Where possible CSJv’s supply chain and staff will use electric vehicles to meet these targets.

7.3.5 HS2 has also set requirements for 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 the LBE the relevant category of NRMM emission standard is the rest of Greater London and the requirement is for NRMM to be powered by EU stage IIIB from 2017 (and EU stage IV from 2020).

7.3.6 The HS2 Information Paper E31: Air Quality gives further information on the HS2 emissions standards.

7.4 Monitoring Procedures

7.4.1 An inspection and monitoring programme will be implemented by the Contractors to assess the effectiveness of the control measures as outlined in section 7.3 of the CoCP. In LBE, the monitoring procedures include monitoring of nitrogen dioxide around highways and continuous automatic monitoring of airborne dust, including the setting of a relevant site action level for dust (defined as a dust measurement threshold above which investigation will be required). The monitoring being undertaken by HS2 supplements existing air quality monitoring which is part of national and local authority surveys. The monitoring programme, including locations, will be discussed with LBE prior to construction.

7.4.2 The HS2 monitoring of nitrogen dioxide around highways commenced in June 2016 and is being undertaken using diffusion tubes. There are currently six monitoring locations within LBE and includes locations where the environmental statement, as amended, identified significant effects, certain locations not expected to be affected by the Scheme for comparison purposes, and locations co-located with automatic

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1 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.

2 Roman numerals are also used within the NRMM EU regulations but are not directly comparable to the road vehicle Euro standards.
monitoring sites which are part of national and local authority surveys for comparison purposes. 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 publically available throughout construction.

7.4.3 Details of the locations of NOx tubes & dust monitoring equipment will be included in the monthly air quality reports uploaded to the https://www.gov.uk/government/organisations/high-speed-two-limited website.

8 Cultural Heritage

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 archaeological and built heritage assets in LBE. 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 of the Act concern how legislation in respect of listed buildings and scheduled monuments respectively apply to the Phase One works. Schedule 20 to the Act provides a regime for the removal of human remains and related funerary monuments.

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 (Appendix CH-002-005 and Cultural Heritage Map Book – Euston and London Metropolitan, ES 3.5.1.4.1).
8.2.2 Contractors will have due regard for the following designated heritage assets:

- The following Grade II listed buildings:
  - Perivale Underground Station, Horsenden Lane
  - Former IBM distribution centre, Green Park Way, Greenford

- Two conservation areas:
  - Old Oak Lane
  - Northolt Village Green
  - Other important heritage assets
  - GWR structures
  - Heritage spring at Victoria Road site

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 Contractors. Detailed provisions with regard to settlement and listed buildings are outlined in the Settlement Policy / HS2 Information Paper: C3 Ground Settlement.

8.3.2 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 Act. Listed buildings named in Table 2 are also covered by a Heritage Agreement with LBE, which sets out arrangements for obtaining approvals for protective or monitoring works to these buildings.

8.3.3 Where practicable suitable locations will be identified for advance planting, to reduce impacts on the setting of assets.

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 The programme of archaeological and built heritage works will be undertaken by specialist Contractors appointed by the nominated undertaker prior to and during the construction period in accordance with the provisions of the Location-Specific Written Scheme of Investigation for archaeology and built heritage.
8.4 Monitoring

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

9 Ecology

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 following locations which lie within or are adjacent to the Scheme in LBE are designated for nature conservation. These locations are shown within the Volume 5 map books of the ES (3.5.1.5.4):

- Perivale Wood Local Nature Reserve (LNR) and Site of Metropolitan Importance (SMI), comprising ancient oak-ash woodland with an understorey of coppiced hazel, uncultivated grassland, grazed pasture land, a small area of damp scrub, three ponds and two small streams as well as several hedgerows.
- London Canals Site of Metropolitan Importance (SMI), which supports a number of scarce wetland plants and uncommon plants on banks, brickwork and towpaths.
- Acton Railsides Site of Borough Importance Grade 1 (SBI.I), comprising wide rail cuttings with areas dominated by woodland and scrub and other more open areas dominated by grassland and tall herb habitats, managed to prevent woody species establishing.
- Central Line West Ruislip Branch Site of Borough Importance Grade 2 (SBI.II), comprises undisturbed rail-side corridor habitat that are well vegetated with scrub and occasional grassy clearings and patches of sycamore woodland.
- Former Guinness Mounds SBI.II, comprising two mounds on both sides of a railway cutting on which habitats have developed on waste construction material.
- River Brent at Hanger Lane SBI.II, comprising a canalised section of the River Brent with strips of semi-natural habitat adjacent along the south bank supporting scrub, scattered trees and ruderal vegetation.
- Victoria Road Railway Banks SBI.II, comprising an extensive area of scrub and trees around a railway junction and surrounding a waste transfer station;
- Silver Link Metro and Dudding Hill Loop in Ealing SBI.II, comprising limited semi-natural habitat in narrow strips.
- Ealing Central Sports Ground Site of Local Importance (SLI), comprising stream/ditch which is largely in an underground pipe, but supports marginal vegetation where it surfaces and a large outgrown hedge.
• North Acton Cemetery SLI, comprising flower-rich grasslands with a variety of herbs; and
• Hanger Lane Gyratory SLI, comprising a small area of land surrounded by Hanger Lane gyratory road junction.

9.2.2 Sensitive habitat receptors outside of designated sites are displayed within the Volume 5 map books of the ES (3.5.1.5.4). These include the Grand Union Canal, a body of slow-moving eutrophic fresh water.

9.2.3 Key protected or important species known or assumed to occur in the vicinity of the works are:

• Bats.
• Birds.
• Water vole.
• Otter.
• Amphibians.
• Common reptiles.
• Terrestrial invertebrates.

9.2.4 Further information on designated sites and legally protected species occurring in this area can be found within Volumes 2 and 5 of the ES.

9.2.5 Contractors will be required to 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.

9.2.6 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 LBE.
Table 1: Standard Ecological Issues and Control Measures Relevant to this Area

<table>
<thead>
<tr>
<th>Species/Species Group</th>
<th>Issue</th>
<th>Standard Control Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sites</td>
<td>The Scheme affects non-statutory wildlife sites</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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 water-borne pollution should also take account of the proximity of these designated sites.</td>
</tr>
<tr>
<td>Bats</td>
<td>All UK bat species and their roosts (even if bats are not present) are fully protected under both UK and European legislation.</td>
<td>Adhere to requirements of licences and, where relevant, Ecology Site Management Plans.</td>
</tr>
<tr>
<td></td>
<td>The Scheme will result in the loss of confirmed bat roosts in trees and buildings.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td>Adopt precautionary approach. Follow appropriate Working Method Statement for demolition of buildings and felling of trees.</td>
</tr>
<tr>
<td></td>
<td>Retained bat roosts are present in close proximity to the Scheme. Caution is required to ensure that these roosts are not disturbed during works.</td>
<td>Where practicable, undertake activities causing disturbance during seasonal periods when bats are likely to be absent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure lighting is directed away from known roosts and minimise night time working in close proximity to retained roosts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Where practicable, temporary structures will be erected to screen the entrances/exits of retained roosts from construction areas.</td>
</tr>
<tr>
<td><strong>Breeding Birds</strong></td>
<td>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.</td>
<td></td>
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<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Great Crested Newt</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Common Amphibians</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Otters</strong></td>
<td>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 otters.</td>
<td></td>
</tr>
</tbody>
</table>

The Scheme will result in the loss of and disruption to bat foraging areas and commuting routes. Where practicable, undertake activities causing loss or disruption during seasonal periods when bats are likely to be less active. 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. Minimise night time working in close proximity to foraging areas and commuting routes.

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.

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.

Adhere to requirements of licences and, where relevant, Ecology Site Management Plans.

Adhere to requirements of HS2 great crested newt organisational licence, method statements, and Ecology Site Management Plans.

Adhere to requirements of licences and, where relevant, Ecology Site Management Plans. Ensure that route of safe passage for otters is maintained throughout construction at crossing points. Use fencing as required to prevent otters being forced over existing road crossings. Minimise light spill onto watercourses.
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, in Technical Note: Ecological principles of mitigation within Volume 5 of the ES and SES3 and AP4 ES (Scope and methodology report addendum (CT-001-000/2)).

9.4 Monitoring

9.4.1 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.
9.4.2 Internal CSjv Invasive Species and Biosecurity Management Plans will be produced, with interface with LBE if required, to manage invasive species discovered on the sites.

10 Ground Settlement

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 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 any 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

11.1.1 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 within the Scheme. These investigations will enable identification and safe design of any needed remediation works. Contaminated sites beyond the Scheme will be considered only in terms of 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.

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 land with potentially contaminative existing or historical uses has been identified as a prospective contaminative risk to HS2 works (and can be seen in Volume 5 map book of the main ES (LQ-001-005)):

- The Old Oak Common rail depot; commercial units to the north of the Grand Union Canal around Hythe Road and the A219 Scrubs Lane, together with the railway land in between.
- The freightliner terminal and adjoining railway land to the west and southwest of Willesden Junction.
- Numerous former and current commercial/light industrial land parcels and railway lines to the north-west and west of Old Oak Common including the Victoria Road Industrial Estate (around the Victoria Road crossover box).
- Former railway land and existing on-site business park and car park at the Westgate vent shaft site.
- The former white lead works, glass works and existing light industrial/commercial units and railway land around the proposed Greenpark Way vent shaft.
- Railway land at the location of the proposed Mandeville Road vent shaft.
- Former and existing railway land at Greenford Station; and
- Off-site industrial estates and former confectionery/unspecified factory at Greenford Station.

11.2.2 With regard to the above identified contaminative risks, the Contractors will have due regard to the following sensitive receptors:
11.3 **Local Control Measures**

11.3.1 Ground investigations are being undertaken to assess areas of potential contamination within the Scheme. Following development of a conceptual site model and a risk assessment a remedial strategy will be prepared, as needed. Consultation with LBE and the Environment Agency should 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, appropriately permitted bio-remediation to remove oil contaminants and disposal off site. For material from Ealing, this will take place off-site at a soil treatment facility or an appropriately permitted landfill site.

11.3.3 Both tunnelling and excavation will be required in LBE. Should the ground investigation discover contaminated materials within the area required to construct the works 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 control migration pathways external to the works where pathways have been affected adversely by the construction.

11.3.4 Similar measures will be undertaken as needed at any other sites where contaminated soils or groundwater are identified during the investigation and / or construction processes.

11.4 **Minerals**

11.4.1 There is no record of mining or quarrying activities, or identified active mining or mineral sites or Preferred Areas (PA) within the area.
12 Landscape and Visual

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

12.2 Sensitive Receptors

12.2.1 With reference to the set-up and location of temporary works, the Contractors will have due regard to limiting impacts of the character of the Old Oak Common landscape character area (LCAs). Other LCAs within LBE are not expected to be significantly affected by the construction works.

12.2.2 The Contractors will also have due regard to limiting visual intrusion on the following visual receptors:

- The protected view in the Northolt Village Green Conservation Area Appraisal, looking over the village green.
- Residents in the Old Oak Common area along Wells House Road, A4000 Victoria Road, Midland Terrace, Old Oak Lane, Shaftesbury Gardens and Stephenson Street.
- Residents located on both sides of the existing railway, in particular along Station Parade/Ealing Road, Carr Road and Badminton Close.
- Residents and recreational users of the Grand Union Canal.
- Recreational users of Acton Cemetery, open spaces and Public rights of way (PRoWs) (e.g. footbridge 70).
- Tower blocks on Victoria Road, the University of Arts London and the Holiday Inn Express London Park Royal, and
- Users of Mandeville Road and Northolt London Underground station.

12.2.3 The Contractors shall also, where practicable, discuss the possibility of advance planting off-site with landowners and LBE 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 Volume 5):

- Maximising the retention and protection of existing trees and vegetation where possible.
- Use of well-maintained hoardings and fencing.
• Use of high-quality hoarding and noise barriers.
• Designing lighting to avoid unnecessary intrusion onto adjacent buildings and other land uses.
• Replacement of any trees felled as a consequence of construction works.
• 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.
• 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
• The specific location of temporary material stockpiles to reduce visual impacts.

12.4 Trees

12.4.1 The Contractors will give consideration to where trees and other planting can be established early in the construction programme. For example, where trees require removal due to utility works early in the programme, replacement trees will be provided at the earliest possible opportunity, where reasonably practicable. The nominated undertaker will ensure any early planting during construction is maintained to promote healthy growth.

12.4.2 Where practicable, the Contractors will agree the details of tree protection measures, in accordance with BS5837, with LBE, in advance of any works in the vicinity of trees.

12.5 Site Buildings for Office and Welfare

12.5.1 The Victoria Road demolition site will make use of existing buildings as the main site office and welfare.

12.5.2 The other sites buildings will generally be of a temporary modular type; they will typically be multi-storey to maximise construction space and limit land take.
13 Noise and Vibration

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 in the ES on plans SV-03-004, SV-03-005, SV-03-006 and SV-03-007 in the Sound, Noise and Vibration Volume 5 map book (ref.: ES 3.5.1.9.1) and Volume 5: Appendix SV-003-004 and Appendix SV-003-005. For further details of these receptors and the potential adverse impacts identified, refer to Volume 2: CFA4 Report and CFA5 Report in the main ES, SES and AP2 ES and SES3 and AP4 ES.

13.2.2 Residential communities forecast to experience direct adverse noise effects from construction are located on the following roads:

- Stephenson Street.
- Goodhall Street.
- Old Oak Common Lane.
- Shaftesbury Gardens.
- Midland Terrace.
- Wells House Road.
- Victoria Road/Chase Road.
- Carr Road.
- Badminton Close, and
- Belvue Road.

13.2.3 Non-residential sensitive receptors for which the ES has reported likely adverse impacts from construction noise are:

- Hostel at Colas Ltd, north entrance, Old Oak Common depot, Old Oak Common Lane.
- Holiday Inn Express, Victoria Road, North Acton.
- Boden House.
- Greenford Mail Centre, and
- ITV studios, Clausen House, Perivale Business Park.
13.2.4 ITV studios, Clausen House, Perivale Business Park has been identified as a potentially ground-borne vibration sensitive non-residential receptor from the operation of TBM. As required by the CoCP, a scoping vibration assessment will be made before any construction works take place that may generate significant vibration effects.

13.2.5 Noise insulation is being offered for qualifying buildings as defined in the noise insulation and temporary rehousing policy within HS2 Information Paper E23. Noise insulation or temporary rehousing will mitigate residents being significantly affected by levels of construction noise inside their dwellings.

13.2.6 Qualifying buildings are being identified in the Ealing area 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.

13.2.7 Some residential dwellings on the following roads have been reported in the ES, SES and AP2 ES and SES3 and AP4 ES as likely to qualify for noise insulation measures:

- Stephenson Street.
- Shaftesbury Gardens.
- Midland Terrace.
- Wells House Road, and
- Victoria Road.

13.2.8 Residential properties that qualify for a noise insulation package will be periodically reviewed, including following any material changes in the proposed construction method and the local control measures and appointment of the Contractors.

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 LBE, and reflected in this document. Furthermore, site specific measures will be identified by the Contractors on a site-by-site and activity-by-activity basis and agreed with the LBE through the Section 61 process. As identified in the ES, examples of best practicable means measures that may be employed by the Contractors 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 i.e hydraulic pulveriser excavator attachment for demolition.

- 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.
- Utilising existing features on the sites to reduce noise impacts on surrounding receptors i.e existing site fencing, 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.

13.3.2 Local control measures will be periodically reviewed, including following any material changes in the proposed construction method and appointment of the Contractors.

13.4 Monitoring

13.4.1 The nominated undertaker 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. As set out in section 4.3.10 of the CoCP, where the nominated undertaker's Contractors are monitoring noise, dust and air quality with equipment capable of streaming data in real time, this will be made available to LBE if a written request is received by the nominated undertaker. In addition, monthly noise monitoring reports will be made publically available throughout construction. The monthly reports will include information such as measurement methodology and monitoring locations.

13.4.2 All sound 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.

13.4.3 Details of locations of monitoring equipment and results can be found in the monthly noise monitoring reports uploaded to the https://www.gov.uk/government/organisations/high-speed-two-limited website.
14 Traffic and Transport

14.1.1 A number of transport and traffic plans will be prepared, in accordance with the Code of Construction Practice, Section 14. A Route-wide Traffic Management Plan (RTMP) will set out the strategic requirement that the Contractors will need to follow, which will be consulted on with all highway authorities through the Highways Sub Group to the Planning Forum.

14.1.2 The Local Traffic Management Plans (LTMPs) will set out how traffic will be managed on a sub-regional level. LTMPs will be consulted through local Traffic Liaison Group meetings. Consultation, consents and notifications for site specific highway works will be undertaken via the local Traffic Liaison Group.

14.1.3 Information on how the local impacts of construction will be mitigated, in particular those associated with the removal of excavated and demolition materials; delivery of construction materials; and construction offices will be included within the LTMP or on a site-specific basis.

14.1.4 Site specific traffic management measures, as detailed within the CoCP, will be discussed with highway authorities and the emergency services via local meetings.

14.1.5 General control measures relating to traffic and transport are provided in Section 14 of the CoCP. Information relating to construction traffic is also provided in Information papers:

- D11: Maintaining access to residential and commercial property during construction;
- E13: Management of traffic during construction; and
- E14: Highways and traffic during construction – legislative provisions.
- 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 Contractors develop the LTMP.
14.3 **Site Access**

14.3.1 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 works in LBE. Highway access notifications and/or approvals will be undertaken in accordance with Schedule 4 of the Act.

14.3.2 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 construction vehicle movements exceed 24 single movements (12 two way movements) per day to and/or from a site.

14.4 **Works to the Highway and Access Measures**

14.4.1 Temporary and permanent road closures and diversions will be required. The scope is assumed as follows:

- Bethune Road will be permanently closed as a through route and will require a pedestrian and cycle diversion via School Road, St. Leonard’s Road and the new link connecting St. Leonard’s Road and Chase Road.
- Atlas Road will be temporarily closed to public traffic within the Atlas Road satellite compound boundary for the duration of the works.
- Temporary pedestrian diversions and lane restrictions will be required along A4000 Victoria Road as a consequence of utility works and road widening operations, and
- Temporary full road closure of Old Oak Common Lane for up to one year for works related to the Old Oak Common Lane underbridge satellite compound. Traffic would be restricted to local access only and a 3.5km diversion would be introduced for general traffic, generally be via A4000 Victoria Road/A4000 Wales Farm Road and the A40. Step-free pedestrian access will be maintained along the whole length of Old Oak Common Lane throughout most of the 12 month period of construction with occasional short-term closures for certain construction works.

14.4.2 Partial road closure on the A312 Mandeville Road may also be needed during the advance works. However, these are not expected to result in full road closures and will have no associated traffic diversions.

14.4.3 All temporary closures and diversions will be subject to submissions and notifications to the relevant highway authority.
14.4.4 Where possible CSJV will look to utilise alternative methods for transporting materials e.g. by train.

14.5 Monitoring Procedures

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

15 Waste and Materials

15.1.1 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

Test and Classification of Materials

15.2.1 The ‘basic characterisation’ 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 Practice 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:

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9 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 The List of Wastes (England) Regulations 2005 SI No. 895) 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.

10 CL:AIRE Definition of Waste: Development Industry Code of Practice, version 2, March 2011
15.2.4 Waste Sampling and Testing for Disposal\textsuperscript{11}; and

15.2.5 Technical Guidance WM3 – Guidance on the classification and assessment of waste (1st edition 2015)\textsuperscript{12}.

15.3 \textbf{Transport of Waste and Materials}

15.3.1 Further information on the management of material and waste is provided in HS2 Information Paper E3: Excavated Material and Waste Management.

15.3.2 Where possible CSjv will look to utilise alternative methods for transporting waste e.g. by train.

16 \textbf{Water Resources and Flood Risk}

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

16.2 \textbf{Sensitive Receptors}

16.2.1 The Contractors will have due regard to the following sensitive local water resource receptors:

- Local aquifers, including: Alluvium (Secondary A aquifer); Taplow Gravel Formation (Secondary A aquifer); Kempton Park Gravel Formation (Secondary A aquifer); Lambeth Group (Secondary A aquifer), Thanet Sand Formation (Secondary A aquifer); and White Chalk Subgroup (Principal aquifer).
- Surface water features, including: River Brent, a Main river; several ponds at Park Royal, Lord Halsbury Memorial Playing Fields, Ealing Golf Course and Horsenden Hill; a number of drains and unnamed watercourses.
- Six licensed surface water discharges, and
- Artificial water bodies, including: Grand Union Canal (Paddington Arm).

16.2.2 The Contractors’ 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 Contractors will have due regard to the following local flood water receptors and their respective flood histories:

- Surface water – The flood map for surface water and preliminary flood risk assessment modelling suggests that there are areas within this study area that have a high risk of surface water flooding in a 1 in 200 annual probability (0.5%) rainfall event. The areas within LBE currently at risk of surface water flooding close to above-ground infrastructure required for the Scheme include:
  - Isolated topographic depressions at Old Oak Common.
  - Bridge on the A4000 Victoria Road.
  - Areas of predicted ponding in the industrial areas at North Acton.
  - Westway Cross Shopping Park close to the Greenpark Way vent shaft, and
  - The Central line cutting at Northolt station, to the south of the Mandeville Road vent shaft.

16.2.4 Surface water flood risk locations are identified on plan WR-01-004 within water resources – London- West Midlands Map book ref: ES 3.5.1.11.1:

- Groundwater - The LBE PFRA indicates that there have been four past incidents of groundwater flooding: two to the south-east of the Hanger Lane junction, one within the valley of the River Brent to the north of the route, and one to the north-east of Northolt station on the London Underground Central line;
- Sewers (Thames Water Utilities Ltd) - Thames Water Utilities Ltd historical sewer flooding records show that there have been a number of sewer flooding incidents in the study area such as to the south-west of the proposed Old Oak Common station and Victoria Road crossover box; and
- A potential risk of flooding associated with a breach of the Grand Union Canal (Paddington Arm) has been identified close to the proposed Old Oak Common station.

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 of surface water sewers in the surrounding receptors.
16.4.2 As outlined in the CoCP, best practice measures 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 runoff from wheel washing facilities or from general construction activities. As noted in Section 5.11 of this document, a pollution incident control plan will be produced which will incorporate procedures for alerting relevant water supply companies and reducing impacts to public supply Source Protection Zones (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. 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 and where appropriate in consultation with relevant stakeholders.

16.4.4 Mitigation during excavation of the tunnels and the Old Oak Common station box will incorporate targeted monitoring of the Grand Union Canal (Paddington Arm) retaining wall to assess any ground movement during construction activities that might have an effect on the structural integrity of the canal wall and trigger a potential breach with any resulting remedial works undertaken.

16.4.5 If dewatering from excavations is required, it will be carried out in consultation with the Environment Agency and 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 Prevention\(^\text{13}\). Groundwater and surface water monitoring plans will be prepared, where piling could affect 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 having an impact on the risk of flooding. Where construction compounds cannot be located outside 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 ES and include any proposed risk management or mitigation measures, if required.

\(^{13}\) Environment Agency (2001), Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention
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 32 Part 5 of the Act.

16.4.9 In certain instances, the excavated retained cut is at a level below the natural groundwater table. Mitigation, where necessary with continuous piles or grouting, will 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, 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 1: Glossary of Terms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP</td>
<td>Additional Provision</td>
</tr>
<tr>
<td>CFA</td>
<td>Community Forum Area</td>
</tr>
<tr>
<td>CoCP</td>
<td>Code of Construction Practice</td>
</tr>
<tr>
<td>Contractor</td>
<td>The Contractor on a construction site is responsible for planning, managing and co-ordinating themselves and/or the works and all other sub-Contractors working on their site, or any other Contractors directly employed by the nominated undertaker to undertake key construction works on site.</td>
</tr>
<tr>
<td>CoPA</td>
<td>Control of Pollution Act 1974</td>
</tr>
<tr>
<td>EMS</td>
<td>Environmental Management System</td>
</tr>
<tr>
<td>ES</td>
<td>Environmental Statement</td>
</tr>
<tr>
<td>GWSi:HERDS</td>
<td>Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy</td>
</tr>
<tr>
<td>HGVs</td>
<td>Heavy Goods Vehicles</td>
</tr>
<tr>
<td>HS2</td>
<td>High Speed Two</td>
</tr>
<tr>
<td>HS2 Ltd</td>
<td>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.</td>
</tr>
<tr>
<td>IAQM</td>
<td>Institute of Air Quality Management</td>
</tr>
<tr>
<td>IP</td>
<td>Information Paper</td>
</tr>
<tr>
<td>LBE</td>
<td>London Borough of Ealing</td>
</tr>
<tr>
<td>LCAs</td>
<td>Landscape Character Areas</td>
</tr>
<tr>
<td>LEMP</td>
<td>Local Environmental Management Plan</td>
</tr>
<tr>
<td>LTMP</td>
<td>Local Traffic Management Plan</td>
</tr>
<tr>
<td>MWCC</td>
<td>Main Works Civils Contractor</td>
</tr>
<tr>
<td>Nominated undertaker</td>
<td>The body or bodies appointed to implement the powers of the Act to construct and maintain the railway.</td>
</tr>
<tr>
<td>NRMN</td>
<td>Non-Road Mobile Machinery</td>
</tr>
<tr>
<td>PROW</td>
<td>Public rights of way</td>
</tr>
<tr>
<td>RRVs</td>
<td>Road Rail Vehicles. A vehicle which can operate both on rail tracks and road, often used for railway maintenance.</td>
</tr>
<tr>
<td>RTMP</td>
<td>Route-wide Traffic Management Plan</td>
</tr>
<tr>
<td>Scheme</td>
<td>The Scheme to which this LEMP relates is the proposed 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...</td>
</tr>
</tbody>
</table>
speeds to the North West and Scotland. It includes four high speed rail stations at London Euston, Old Oak Common (West London), Birmingham Airport (Birmingham Interchange) and Birmingham (Curzon Street).

<table>
<thead>
<tr>
<th>SCSJV</th>
<th>Skanska Costain STRABAG Joint Venture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 61</td>
<td>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).</td>
</tr>
<tr>
<td>SES</td>
<td>Supplementary Environmental Statement</td>
</tr>
<tr>
<td>SLI</td>
<td>Site of Local Importance</td>
</tr>
<tr>
<td>SMI</td>
<td>Site of Metropolitan Importance</td>
</tr>
<tr>
<td>SPZ</td>
<td>Source Protection Zone</td>
</tr>
<tr>
<td>SSMP</td>
<td>Site Specific Management Plan</td>
</tr>
<tr>
<td>UKAS</td>
<td>United Kingdom Accreditation Service</td>
</tr>
<tr>
<td>WSI</td>
<td>Written Scheme of Investigation</td>
</tr>
</tbody>
</table>
# Appendix 2: Non-exhaustive list of Community Groups in London Borough of Ealing

<table>
<thead>
<tr>
<th>Groups</th>
<th>Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisations</td>
<td>London Borough of Ealing</td>
</tr>
<tr>
<td></td>
<td>Transport for London</td>
</tr>
<tr>
<td></td>
<td>Old Oak and Park Royal Development Corporation (OPDC)</td>
</tr>
<tr>
<td></td>
<td>Crossrail</td>
</tr>
<tr>
<td></td>
<td>Canal &amp; River Trust</td>
</tr>
<tr>
<td></td>
<td>Walking on Wood</td>
</tr>
<tr>
<td>Residents Groups</td>
<td>Wells House Road Residents Association;</td>
</tr>
<tr>
<td></td>
<td>The Island Triangle Residents’ Association;</td>
</tr>
<tr>
<td></td>
<td>North Action Residential Blocks;</td>
</tr>
<tr>
<td></td>
<td>Shaftsbury Gardens Residents; and</td>
</tr>
<tr>
<td></td>
<td>Midland Terrace Residents.</td>
</tr>
<tr>
<td>Businesses</td>
<td>Holiday Inn, Victoria Road;</td>
</tr>
<tr>
<td></td>
<td>Commercial operations in Boden House;</td>
</tr>
<tr>
<td></td>
<td>Greenford Mail Centre; and</td>
</tr>
<tr>
<td></td>
<td>ITV, Perivale Business Park.</td>
</tr>
<tr>
<td>Other Community Facilities</td>
<td>Schools (e.g. Northolt High School, Selborne Primary School and Eden Independent School)</td>
</tr>
<tr>
<td></td>
<td>Community Halls (e.g. Islip Manor Youth and Community Centre, and Perivale Community Centre);</td>
</tr>
<tr>
<td></td>
<td>Recreational facilities (e.g. Brentham Sports and Social Club); and</td>
</tr>
<tr>
<td></td>
<td>Places of Worship</td>
</tr>
</tbody>
</table>