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High Speed Rail  
(London-West Midlands)  
Local Environmental Management Plan  
Lichfield District Council

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December 2017





## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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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 HS2 Contractors working within the Lichfield District Council (LDC) area. This LEMP builds upon but does not repeat the HS2 general environmental requirements set out in the Control of Construction Practice (CoCP) (available online at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/593592/Code\\_of\\_Construction\\_Practice.pdf](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 LDC 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 maintenance of this LEMP 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 LEMPs.

- 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 AP<sub>2</sub> ES, SES<sub>3</sub> and AP<sub>4</sub> ES and SES<sub>4</sub> and AP<sub>5</sub> 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 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 (HS<sub>2</sub> Ltd)<sup>1</sup> 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 HS<sub>2</sub> Environmental Memorandum identifies key worksites along the route of HS<sub>2</sub> 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 HS<sub>2</sub> National Environment Forum<sup>2</sup> members) is generated in any of the environmental topics' as mentioned above. There are currently no such sites identified in LDC.
- 1.1.9 The controls within this LEMP, as with those in the CoCP, are in line with HS<sub>2</sub>'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 HS<sub>2</sub> documents referenced within this LEMP can be found on the [www.gov.uk](http://www.gov.uk) website.

## **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 – CT-05-116b to CT-05-130a and CT-05-142 to CT-05-147.
- 1.2.2 Construction worksites and areas required for construction works are shown within the maps listed in Appendix 2.
- 1.2.3 It is anticipated that the following general descriptions of work activities are to take place during core and non-core working hours (see Section 5.3 for a description of non-core working hour activities) during the construction period within this local authority boundary:

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<sup>1</sup>HS<sub>2</sub> Ltd is the Nominated Undertaker. The two terms are used interchangeably throughout this LEMP.

<sup>2</sup> The National Environment Forum comprises Government departments and statutory bodies and was established to advise on environmental policy for HS<sub>2</sub>, including project-wide strategies for reducing the environmental impact of the line and principles for a Code of Construction Practice.

- 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;
- civil engineering works including those associated with stations: 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
- system testing and commissioning.

## 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 LDC 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 LDC 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.

## 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.
- 4.1.2 On 16 November 2016 contracts were awarded for three Enabling Works Contractors (EWC) working on behalf of HS2 Ltd across Phase 1 of the project. The EWC covering the LDC area is the LM Joint Venture, a joint venture between Laing O'Rourke and J. Murphy & Sons
- 4.1.3 On 17 July 2017 contracts were awarded for HS2's Main Works Civils Contractors (MWCC). The MWCC for the LDC area is Balfour Beatty Vinci (BBV). BBV is a joint venture made of Balfour Beatty Group Ltd, VINCI Construction Grands Projets, VINCI Construction UK Ltd, VINCI Construction Terrassement.

## 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, as detailed below.
- 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 LDC 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, 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 3 of this LEMP. (NB: This list is indicative and will be subject to change as more information becomes available.)

### **Advanced notice of works**

- 5.1.8 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.

## **5.2 Working hours**

### **Consents**

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

### **Core working hours**

- 5.2.2 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.
- 5.2.3 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 the 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 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 S61. n.b. emergencies (not repairs and maintenance) may be undertaken outside core hours.
- 5.2.4 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.
- 5.2.5 It is currently envisaged that a number of railway possessions (to be carried out during non-core hours) will be required for the following locations:
- The West Coast Main Line (WCML) crossing north of Broad Lane / Cappers Lane. Chainage 183.950km.

- The South Staffordshire Rail Line crossing south of the A38 Diveunder. Chainage 184.900km.
- The WCML connection south of Handsacre. Chainage 190.200km to 192.765km.
- The Streethay Cutting/Dive-under piling and excavation works between Cappers Lane and Mare Brook Water course. Chainage 184.100km to 185.200km.

5.2.6 To limit the number of possessions that will be undertaken, a protective barrier is likely to be installed between the existing railway and HS2 worksites to allow the works to be carried out during core working hours where stipulated clearances can be met, in accordance with S61 processes.

5.2.7 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.

5.2.8 Road Rail Vehicles (RRV's<sup>3</sup>) 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.

## 5.3 Construction site layout and good housekeeping

5.3.1 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.

## 5.4 Site lighting

5.4.1 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 accordance with Schedule 17 Part 1 of the Act.

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

## 5.5 Worksite security

5.5.1 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.

5.5.2 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.

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<sup>3</sup> RRV's – A vehicle which can operate both on rail tracks and road, often used for railway maintenance.

- 5.5.3 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.
- 5.5.4 In some situations, particularly in an urban setting where the public interface with construction works will be greater, 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, dependant on duration, will have security lighting to ensure the safety of passing pedestrians and other traffic. Details can be found in Information Paper D10: Worksite Security.
- 5.5.5 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.

## **5.6 Hoardings, fencing and screening**

- 5.6.1 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.
- 5.6.2 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, temporary wire mesh fencing or other suitable alternatives will be used. Specific hoarding heights in LDC will be included in this LEMP as and when the hoarding designs are finalised.
- 5.6.3 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.
- 5.6.4 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.

## **5.7 Unexploded ordnance**

- 5.7.1 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.

## **5.8 Electromagnetic interference**

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

## **5.9 Temporary living accommodation**

5.9.1 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.

## **5.10 Occupational healthcare**

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

## **5.11 Clearance and re-instatement of sites on completion**

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

## **5.12 Pollution incident control and emergency preparedness**

5.12.1 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.

5.12.2 The plan will also consider measures and processes to be implemented in the event of environmental non-conformances.

### **Local control measures**

5.12.3 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; and
- the use of oil interceptors at site offices and work compounds;

5.12.4 The Contractor's pollution incident control and emergency preparedness plan(s) will need to have due regard to local context.

## **5.13 Fire prevention and control**

5.13.1 The Contractor's 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.

## **5.14 Extreme weather events**

5.14.1 The Contractors' pollution incident control and emergency preparedness systems will need to have due regard to the potential of extreme weather events on 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.

## **5.15 Carbon management plans**

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

## **5.16 Interface management between adjacent construction areas**

5.16.1 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 Approximately 500ha of agricultural land will lie within the construction boundary in the LDC area. Approximately 86% of this land is of the best and most versatile quality (Grades 2 and 3a), 13% is moderate quality land (Subgrade 3b) and the remaining 1% is Grade 4.

6.2.2 Approximately 478ha of the agricultural land will be required permanently for the Scheme, with the remaining 22ha restored to agriculture.

6.2.3 The generally 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 the approximately 22ha of land within the construction boundary in LDC 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. In the provision of early ecological mitigation areas the top soil and sub-soil will be entirely reused within the boundaries of each site and therefore an SRP will not be produced for these sites.

- 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 an appropriate management regime. This will identify and effectively treat areas which that could threaten adjoining agricultural areas.
- 6.3.4 Appropriate construction, handling, treatment and disposal procedures will be implemented in relation to invasive non-native species. 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 Scheme. Further details are provided in the CoCP.
- 6.3.5 Measures for the protection of farm infrastructure and crops will be subject to liaison with landowners, occupiers and land agents. Following consultation with individual farmers, arrangements are being made with the farmer and 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

- 7.1.1 General control measures relating to the management of air quality during construction 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'<sup>4</sup>.

### 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

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<sup>4</sup> *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*

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 at relevant receptors are identified in the SES and AP2 ES report (Volume 2: CFA21 and CFA22 Reports, Chapter 4 Air quality and the Volume 5: Appendices AQ-001-021 and AQ-001-022) and SES and AP2 ES (Volume 2: CFA21, Volume 2: CFA22 and Volume 5: Appendices AQ-001-022). 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.
- 7.2.4 In the LDC boundary, the specific locations with relevant receptors that should explicitly be considered in the Contractor's working methods include: properties along Drayton Lane, Drayton Bassett; Draytonlane End Farm, A453 Sutton Road, Tamworth; properties along Rock Hill near A5 Watling Street, Weeford; properties along Flats Lane, Lichfield; Packington Moor Farm, Jerry's Lane, Lichfield; properties along the A51 Tamworth Road, Lichfield; around Mill Farm, Capper's Lane, east of Streethay; the property on Broad Lane, east of Lichfield; properties around The Manor House, Burton Road, north-east of Streethay; properties around Wood End Farm and The Cottage, Wood End Lane, Curborough; Wood End Lock Cottage, Wood End Lane, Curborough; Black Slough Farm & Woods Farm, Wood End Lane, Curborough; Shaw Lane Farm, Shaw Lane, Hanch; and Hayes Meadow Primary School, Handsacre.
- 7.2.5 The following non-statutory designated sites which should explicitly be considered in the Contractor's working methods include Rookery Site of Biological Importance (SBI); Whittington Heath Golf Course SBI; Big Lyntus SBI; Fradley Wood Biological Alert Site (BAS); Wood End Lock SBI; Ravenshaw Wood, Black Slough and Slaish SBI; Tomhay Wood SBI; Vicar's Coppice BAS; John's Gorse SBI; and Tuppenhurst Lane (west of) SBI. These are all sites with local wildlife site (LWS) status.
- 7.2.6 The Institute of Air Quality Management (IAQM) methodology 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.
- 7.2.7 Specific locations that should explicitly be considered in relation to construction traffic exhaust emissions include: along the A453 Sutton Road, Tamworth; along the A5 east of the junction with the A38; along the A5 between the junction with the A38 and M6 Toll junction T5; adjacent to the A38 between A5 and A5148; along the A5127 Birmingham Road between the M6 Toll junction T5 and A461 south of Lichfield; and around the A38 from Streethay to Fradley Business Park. These locations were assessed to have a negligible impact, but should remain under review with regard to any changes to plans for the movement of excavated material during the construction phase.

## 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. Measures can include;

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 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 LDC 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 2020<sup>5</sup>. 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 LDC 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 IIIB<sup>6</sup> from 2017 and from EU stage IV from 2020<sup>7</sup>. Further details on emission standards are given in HS2 Information Paper E31: Air Quality.

## 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. In LDC, the monitoring procedures may include continuous automatic monitoring of airborne dust, including the setting 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.
- 7.4.2 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. These can be found on the HS2 website at this address: <https://www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2>.
- 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

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<sup>5</sup> 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.

<sup>6</sup> IIIA for constant speed engines of any power, as there is no corresponding Stage IIIB or IV at EU level

<sup>7</sup> Roman numerals are also used within the NRMM EU regulations but are not directly comparable to the road vehicle Euro standards

methods to be used. This document is available at the same website address as referenced in paragraph above.

## 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 LDC. 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 main ES (Appendices CH-001-021, CH-002-021, CH-003-021, CH-004-021, CH-001-022, CH-002-022, CH-003-022 and CH-004-022 and Maps CH-01-117, CH-01-118, CH-01-119a, CH-01-119b, CH-01-120, CH-01-121, CH-01-122 and CH-01-123) and Volume 5 of the SES and AP2ES (Appendices CH-001-021, CH-002-021, CH-003-021, CH-001-022, CH-002-022 and CH-003-022 and Maps CH-01-118 and CH-01-120).
- 8.2.2 Contractors will have due regard for the following designated heritage assets:
- The Manor House, Ryknield Street – Grade II Listed
  - The Manor House Plunge Bath, off A517 Burton Road – Grade II Listed
  - L-Shaped range of outbuildings at Bucks Head Farm – Grade II Listed Buildings adjacent to the Scheme
  - Trent and Mersey Canal Conservation Area - adjacent to the Scheme

### 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 regard to 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 Act and are the subject of Heritage Agreements with LBC and Historic England. These agreements require details of works concerning each of the listed buildings to be submitted to LDC 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 Act. Listed buildings named in Table 2 are also covered by a Heritage Agreement with LDC, 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.

## **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**

- 9.1.1 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 LDC are designated for nature conservation (and which are shown within the Volume 5 map books of the ES). Note that the designations applying to these sites will impose constraints on working practices that will need to be adhered to.

- Waggoner's Lane (Hedge 1) SBI and important hedgerow (Ch175+400) is partly within the land required for the construction of the Scheme.
- Roundhill Wood SBI and ancient woodland (Ch176+400) is partly within the land required for the construction of the Scheme.
- Rookery Wood SBI and ancient woodland (Ch176+800) is partly within the land required for the construction of the Scheme.

- Black Brook Corridor: Black Brook Bridge – Heart of England Way BAS (Ch177+800) is crossed by the route of the Scheme.
- Snake’s Hill and River Oxbow, Black Brook SBI (Ch177+200) is partly within the land required for the construction of the Scheme.
- Bourne Brook Corridor, Botley House to Bourne Bridge BAS (Ch176+600) is located adjacent to the land required for the construction of the Scheme with a small section within the land required along the southern boundary.
- Ford (Oxbow Woodland) to Botley House, Bourne Brook Corridor BAS (Ch176+750) is partly within the land required along the southern boundary.
- Rough Leasow SBI and ancient woodland (Ch177+500) adjacent to an area where new woodland will be planted as part of the Scheme.
- Moor Covert and Pool SBI (Ch179+600) is adjacent to the land required for the construction of the Scheme.
- Whittington Heath Golf Course SBI (Ch182+000), a mosaic of habitats, including heathland, is bisected by the land required for the construction of the Scheme.
- Curborough House Hedgerows SBI (Ch187+500) - the northern part of the SBI lies within the area required for the construction of the Scheme.
- Big Lyntus SBI and ancient woodland (Ch187+800) – the northern part of this woodland is replanted ancient woodland and it is located within the land required for the construction of the Scheme.
- Fradley Wood BAS (Ch188+000) – the southern part of the site lies partially within the land required for the construction of the Scheme (Manchester spur).
- Wood End Lock SBI (Ch188+250) - small deciduous wood within the land required for the construction of the Scheme.
- Trent and Mersey Canal and Coventry Canal, Kings Bromley Wharf to Fradley Junction and from Fradley Junction to Fradley Bridge SBI (Ch188+000), which is adjacent to the route of the Scheme (the scheme crosses the Trent and Mersey Canal SBI once for the Manchester Spur at Fradley Gorse/Brokendown Wood).
- Ravenshaw Wood, Black Slough and Slaish SBI part of which is also ancient woodland (Ch189+200) is partly within the land required for the construction of the Scheme.
- Vicar’s Coppice BAS and ancient woodland (Ch190+200), which is partially within the land required for the construction of the Scheme.
- John’s Gorse SBI and ancient woodland (Ch190+700) is within the land required for the construction of the Scheme.
- Tuppenhurst Lane (west of) SBI (Ch192+000) is partly within the land required for the construction of the Scheme.

- Fullbrook Farm (hedge) BAS (Ch188+500) located adjacent to the land required for the construction of the Scheme
- Tomhay Wood SBI (Ch189+700) – remnant area of ancient woodland adjacent to the land required for the construction of the Scheme.

#### 9.2.2

Sensitive habitat receptors outside of designated sites are displayed within the Volume 5 map books of the main ES (Volume 5, Ecology Map Books CFA21-22) and SES and AP2 ES (Volume 5 Environmental Topic Map Books: Ecology CFA21-22). From south to north these include:

- Gallows Brook (Ch172+450), which is crossed by the Scheme and is on the border between North Warwickshire District and Lichfield District.
- An unnamed copse off Drayton Lane (Ch174+500), an area of broadleaved woodland with ancient characteristics which is within the land required for the construction of the Scheme.
- Weeford Park (Ch176+200) replanted ancient woodland, which is partially within the land required for the construction of the Scheme.
- Woodland habitat at Job's Hill Plantation (Ch177+400) is partly within the land required for the construction of the Scheme.
- Important hedgerows west of Hill Farm, north of Drayton Bassett (Ch174+500); along the A453 Sutton Road near Drayton Bassett (Ch174+500) and west of Whittington Barracks (Ch180+850), all within the land required for the construction of the Scheme.
- Wyrley and Essington Canal (Ch183+450), which is realigned and crossed by the Scheme.
- Fulfen Wood ancient woodland (Ch184+000) which is within the land required for the construction of the Scheme.
- Coventry Canal (Ch185+000) is near to the land required for the construction of the Scheme.
- Mare Brook south and north arms (Ch185+600), the unnamed tributary of Fisherwick Brook (Ch184+200), and Curborough Brook (Ch188+300), which are all crossed by the Scheme.
- Little Lyntus ancient woodland (Ch187+300), which is within the land required for the construction of the Scheme.
- Full Brook (Ch189+300), which is crossed by utilities diversions associated with the Scheme.
- Bourne Brook (Ch190+550), which is crossed by the Scheme.
- Hanchwood House Wood ancient woodland (Ch190+800) and Harvey's Rough ancient woodland (Ch191+300) within the land required for the construction of

the Scheme.

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

- bats (roosts and key commuting and foraging habitat)
- water vole
- birds assemblage (e.g. barn owl and hobby)
- great crested newt and other amphibians
- otter
- badger
- common reptiles
- notable plants (e.g. horned pondweed and veteran field maple).

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 main 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 Contractors will be required to reduce 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.

9.2.7 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 Sites	The Scheme affects SSSI, LNR and non-statutory wildlife sites	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.

Receptor	Issue	Standard control measure
		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.
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 licences 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 these roosts are not disturbed during works.	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 night time working in close proximity to retained roosts.  Where practicable, temporary structures will be erected to screen the entrances/exits of retained roosts from construction areas.
	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.

Receptor	Issue	Standard control measure
		Reduce night time working in close proximity to foraging areas and commuting routes.
Breeding birds	<p>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.</p> <p>The Scheme will result in the loss of nesting bird habitat, including vegetation, buildings and structures.</p>	<p>Habitat clearance should be conducted outside of the bird nesting season (March to August inclusive) where practicable.</p> <p>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.</p>
Great crested newt	<p>Great crested newts and their habitats are fully protected under both UK and European legislation.</p> <p>The Scheme will result in the loss of water bodies and terrestrial habitat used by great crested newts.</p>	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.	<p>Drain down of ponds should be conducted outside of the main breeding period for amphibians (March to August) where practicable.</p> <p>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.</p>
Otter	<p>Otters are fully protected under both UK and European legislation.</p> <p>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 during construction along some parts of the Scheme.</p>	<p>Adhere to requirements of licences and, where relevant, Ecology Site Management Plans.</p> <p>Ensure that route of safe passage for otters is maintained throughout construction at crossing points.</p> <p>Use fencing as required to prevent otters being forced over existing road crossings.</p> <p>Reduce light spill onto watercourses.</p>

Receptor	Issue	Standard control measure
Common reptiles	<p>Common species of reptile (grass snake, adder, common lizard and slow worm) are protected from intentional killing or injury.</p> <p>Common reptiles are widespread, and the Scheme will result in the loss of confirmed and potential reptile habitat.</p>	<p>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.</p> <p>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 produced in advance of works commencing. This will include details of the approach, any exclusion fencing required, and details of the receptor site.</p>
Badger	<p>Badgers and their setts are protected under the Protection of Badger Act 1992.</p> <p>Badgers are widespread, and the Scheme will result in the loss of badger habitat, including setts.</p>	<p>Adhere to the requirements of the HS2 badger organisational licence, method statements, and Ecology Site Management Plans.</p> <p>Avoid badger setts to reduce disturbance where they do not need to be closed.</p> <p>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 to be stopped if potential setts are identified and an ecologist contacted for advice.</p>
Water vole	<p>Water voles are fully protected under UK legislation.</p> <p>Suitable habitats for water vole may be present within the Scheme construction locations.</p> <p>As part of the precautionary assessment, it is assumed that a population of water voles may be present in low numbers.</p>	<p>An appropriate Working Method Statement should be produced in advance of works commencing, where relevant.</p> <p>Adhere to requirements of translocation licence, where relevant.</p> <p>Contractors 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.</p>

Receptor	Issue	Standard control measure
Aquatic wildlife (such as fish, eels, 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 HS2 organisational fish permit.
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 already 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.
General	Unexpected discovery of legally protected species during works.	There will be a procedure to follow in the unexpected event that protected species are identified during construction. This will include seeking appropriate licences and consulting with Natural England.  Unexpected finds of great crested newts or badgers are covered by the organisational licences and works must be in accordance with those licences.

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 main ES (identified within the SMR Addendum (Volume 5: Appendix 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.

## 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 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

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 for the area. 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.

- 11.1.1 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 possible contaminative risk to HS2 works within the LDC Area:

- Buck's Head Farm off Watling Street (178+140 to 178+290)
- Packington Moor Farm off Jerry's Lane (180+000 to 180+150)
- Whittington Heath, historically in military use (181+480 to 182+300)
- infilled mill pond adjacent to Mill Farm off Capper's Lane (183+300 to 183+320)
- infilled section of the Wyreley and Essington Canal to the north of Mill Farm (183+420 to 183+480)
- WCML to the east of Lichfield (183+950) and to the south-east of Handsacre (189+900 to 192+300)
- airstrip located to the east of Lichfield (184+500 to 184+900)
- South Staffordshire Line to the east of Lichfield (184+930)
- former military airfield at Fradley (185+930 to 187+600).

The following have been identified within or up to 250m from the area of land required to build the Scheme:

- White House Farm off Bangley Lane (175+420 to 175+560)
- infilled pond off Watling Street (177+990)
- vehicle repair garage off A51 Tamworth Road (181+380)
- DMS Whittington (180+710 to 181+850)
- infilled pond off the A38 to the north east of Streethay (185+200)
- disused tip to the south of the Trent and Mersey Canal and to the north of Big Lyntus (187+950)
- infilled pits located to the west of Vicar's Coppice (190+460)
- assumed infilled well off Tuppenhurst Lane (191+140)
- infilled marl pits to the south east of Ashton Hayes Farm (191+430 and 191+460)
- infilled pond to the west of Ashton Hayes Farm (191+630)
- infilled pond adjacent to the southern outskirts of Handsacre (192+270)
- 'landfill site at Lichfield Road' historical landfill in the southern outskirts of Handsacre (192+340)
- infilled pit to the south east of Handsacre (192+600).

11.2.2 With regard to the above identified contaminative risks, the lead Contractor will have due regard to the following sensitive receptors:

- people, including residents in existing properties, local employees, construction and/or maintenance workers and the wider community
- controlled waters, including ground waters in the Sherwood Sandstone Group principal aquifer and various Secondary A and Secondary B aquifers
- the built environment, including buildings, property and underground structures and services
- the natural environment.

### **11.3 Local control measures**

11.3.1 Ground investigations are to be undertaken to confirm areas of potential contamination within the Scheme. Following a conceptual ground model, risk assessment and a remedial strategy will be prepared, as needed. Consultation with LDC and the Environment Agency will take place during the formulation of the 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 or groundwater excavated from the site are to be separated from other materials and, wherever reasonably practicable, will be treated as necessary to remove or render any contamination inactive, and reused within the Scheme where needed and suitable for use. Treatment techniques are likely to include stabilisation methods, soil washing and appropriately permitted bio-remediation to remove oil contaminants. Contaminated soil disposed off-site will be taken to a soil treatment facility, another construction site (for licensed treatment, as necessary, and reuse) or an appropriately permitted landfill site.

11.3.3 Excavation through Buck's Head Farm, Packington Moor Farm, Whittington Heath and the airfield to the east of Lichfield in the LDC area will be required. 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 control migration pathways external to the works where pathways have been 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 Consultation Areas in the Lichfield District relating to superficial and bedrock-derived sand and gravel.

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 Staffordshire County Council and any other interested parties to assist in achieving an effective management of minerals within the location of the affected Mineral Consultation Areas and Areas of Search.

## 12 Landscape and visual

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 The lead Contractor will have due regard to limiting impacts of the character on the following landscape character areas (LCAs) which are shown within the Volume 5 map books of the main ES (Volume 5, Landscape and visual map book for country: north):

- Lowland Village Farmlands LCA
- Sandstone Hills and Heaths LCA
- Sandstone Estatelands LCA
- Sandstone Outer Estatelands LCA
- Settled Farmlands LCA
- Settled Heathlands LCA.

12.2.2 The lead Contractor will also have due regard to limiting visual intrusion on the following visual receptors (the word 'area' in this context means the study area of the HS2 main ES):

- residents in the area, including scattered farmsteads and individual properties, the hamlets at Drayton Lane, Shirrall Hall, Bangle, Whittington Hill and Curborough and the villages of Drayton Bassett, Hints, Weeford, Whittington and DMS Whittington, Huddlesford, Streethay and Armitage with Handsacre, as well as properties on the eastern and northern edges of Lichfield
- recreational users on PRoW throughout the area, including the Heart of England Way and users of the Wyrley and Essington Canal, Coventry Canal, Trent and Mersey Canal and their marinas and towpaths
- people travelling on roads in the area, including Drayton Lane, A453 Sutton Road, Watling Street, A5 trunk road, Flats Lane, Jerry's Lane, A51 Tamworth Road, Lichfield Road, Marsh Lane, Darnford Lane, Cappers Lane, Broad Lane, A38 trunk road, Netherstowe Lane, Wood End Lane, A515 Lichfield Road, Shaw Lane, Tuppenhurst Lane and B5014 Lichfield Road
- people at places of work, including Fradley Business Park.

- 12.2.3 There are no sensitive sites in this area for the Contractors to be aware of.
- 12.2.4 The lead Contractor shall also discuss the possibility of advance planting off-site with landowners and with LDC 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
- replace any trees intended to be retained which may be accidentally felled or die as a consequence of construction works
- undertake appropriate maintenance of planting and seeding works and implement management measures throughout the construction period as landscape works are completed
- position temporary bunds to screen views to the route construction
- identify specific locations of construction compound layouts and site access in relation to existing vegetation to reduce visual impacts where practicable
- the specific location of temporary material stockpiles to reduce visual impacts.

### **12.4 Trees**

12.4.1 The Contractor 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 Contractor will carry out surveys in accordance with BS 5837:2012 and agree the details of tree retention and protection measures, Trees in relation to design, demolition and construction recommendations, with LDC, in advance of any works 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 multi-storey to maximise construction space and limit land take.

## 13 Noise and vibration

13.1.1 The objective of the Noise and Vibration Local Environmental Management Plan will be to, as far as reasonably practicable, seek to control and limit noise and vibration levels so that affected properties and other sensitive receptors are protected from excessive noise and vibration levels associated with construction activities.

### 13.2 Sensitive receptors

13.2.1 Noise and vibration construction assessment locations, at sensitive residential and non-residential properties, are shown on the detailed maps in the main ES, Map Series SV-03 (Volume 5, Sound, noise and vibration map book: country north, ref ES 3.5.1.9.3). For further details of these receptors and the potential adverse impacts identified, refer to the main ES (Volume 2: CFA21 and CFA 22 reports, Section 11 and the Volume 5: Appendix SV-003-021 and SV-003-022 reports).

13.2.2 There are numerous residential and non-residential properties located in proximity to the works sites which without appropriate mitigation are likely to experience adverse effects from construction noise and/or vibration. Specific noise sensitive receptors identified include:

#### *Residential*

- Draytonlane End Farm, Sutton Road, Mile Oak
- White House Farm, Bangle Lane, Hints
- Hints Court, Hints
- School Lane, Hints
- Watling Street, Weeford
- Packington Moor Farm, Jerrys Lane, Whittington
- South Lodge, Tamworth Road, Whittington
- Ellfield House, Lichfield Road, Whittington
- Hill Farm, Darnford Lane, Whittington
- Darnford Lane, Whittington
- Cappers Lane, Huddlesford
- Mill Farm, Cappers Lane, Huddlesford
- Potters Thatch, Park Lane, Huddlesford
- Hill Farm, Streethay
- Burton Road, Streethay
- Gorse Farm, Gorse Lane, Curborough

- Tuppenhurst Lane, Kings Bromley
- Aston Hays Farm, Tuppenhurst Lane, Kings Bromley
- Chestnut Close, Handsacre
- Rowan Drive, Handsacre
- Warren Croft, Handsacre
- Barn Road, Handsacre

*Non-residential*

- Hayes Meadow Primary School, Handsacre
- Ellfield Nurseries, Whittington Common Road, Whittington
- Kings Orchard Marina, Streethay
- Cappers Lane, Huddlesford
- Packington Moor Farm Shop, Jerry's Lane, Whittington
- St Bartholomew's Church, School Lane, Hints
- Hints Village Hall, Hints
- Bangley Lane, Hints.

### **13.3 Local control measures**

- 13.3.1 Consents under section 61 of the Control of Pollution Act 1974 will be obtained for the construction works and applications will normally be made at least 28 days before the relevant work is due to start. The works will be carried out in accordance with the conditions of the consent. Furthermore, site specific measures will be identified by the works Contractor on a site-by-site and activity-by-activity basis and agreed with LDC through the Section 61 process, as set out in the HS2 S61 guidance document.
- 13.3.2 Site specific best practicable means measures to control noise and vibration have been identified through the Parliamentary process and discussions with LDC, and are reflected in this document. Furthermore, site specific measures will be identified by the works Contractor on a site-by-site and activity-by-activity basis and agreed with LDC through the Section 61 process. 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.
- 13.3.3 As identified in the CoCP, examples of BPM 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 proximity to noise sensitive receptors. This may include placing any stacked porta-cabins between noisy works and sensitive receptors.

- 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;

- 13.3.4 Where, despite the implementation of BPM, the noise exposure exceeds the criteria defined in the CoCP (section 13), the Contractor may offer noise insulation or ultimately temporary re-housing.
- 13.3.5 Taking account of the avoidance and mitigation measures as set out in the CoCP, two residential properties located on Park Lane, Huddlesford and Mile House Farm, Banglely Lane, Hints (represented by assessment location IDs 17748 and 721001 on plans SV-03-062 and SV-03-059 respectively within the main ES Volume 5, Sound, noise and vibration - Country North map book) are forecast to experience noise levels higher than the noise insulation trigger levels as defined in the CoCP for both day time and night time periods.
- 13.3.6 Local control measures will be periodically reviewed, including following any material changes in the proposed construction method and appointment of the works Contractor.
- 13.3.7 Eligibility for noise insulation and/or temporary re-housing will be determined once detailed construction planning information is available.
- 13.3.8 Details of eligibility will be included in the section 61 consent application.

## **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
- 13.4.2 The locations at which the main ES has predicted adverse impacts from construction noise and/or vibration will be used as the basis of the initial discussions with the LDC to define the locations to be included in the Section 61 consent application. These discussions should include the need for monitoring and its duration. It should be noted that alternative locations may be identified as a result of these discussions.
- 13.4.3 In LDC, further pre-construction baseline monitoring at specific locations relating to stationary systems is proposed to be undertaken and specific monitoring locations are currently being agreed with LDC.
- 13.4.4 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 LDC if a written request is made. 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. These can be found on the HS2

website at this address: <https://www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2>.

- 13.4.5 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.

## 14 Traffic and transport

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 project;
- The Local Traffic Management Plans (LTMP) will set out matters such as planned worksites, lorry routes and the programme of major traffic management measures expected to be necessary within particular areas along the route;
- 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; 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 Contractor develops the overall programme within the LTMP and the site specific traffic management schemes.
- 14.2.2 These requirements will be addressed appropriately through 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 LDC area these include local roads that are affected by the Scheme and include the following:
- Drayton Lane south of A453
  - A453 Sutton Road
  - A5 - Watling Street
  - Flats Lane north of Watling Street
  - A5192 Capper's Lane in Lichfield
  - A5127 through Streethay
  - A51 Tamworth Road
  - A5206 London Road south of A51
  - Wood End Lane
  - A515 Lichfield Road.

### **Site access**

- 14.2.4 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.
- 14.2.5 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.
- 14.2.6 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 followings:

- Shirrall Drive to join Drayton Lane
- Drayton Lane south of A453
- A453 Sutton Road
- Bangley Lane
- Brockhurst Lane
- Flats Lane, north of Watling Street
- temporary diversion of Lichfield Road, Whittington, while a new online underpass is built
- Darnford Lane, west of Whittington
- Capper's Lane east of A38
- Broad Lane to the north of Capper's lane
- Wood End Lane
- Netherstowe Lane
- Watery Lane
- temporary realignment of the A515 Lichfield Road.

14.3.2 The above highways will also be permanently realigned as part of the final scheme as they pass under or over the route of HS2, although the A543 Sutton Road, Lichfield Road Whittington and A515 Lichfield Road will be reinstated to their existing horizontal alignments.

14.3.3 There will also be temporary road closures, overnight and at weekends, to accommodate on-line works on the following roads:

- Watling Street
- A51 Tamworth Road
- A5 (on this road there will in addition be traffic management schemes and lane width restrictions to accommodate works to the main carriageway)
- A38 (on this road there will in addition be traffic management schemes and lane width restrictions to accommodate works to the main carriageways and to slip roads at Streethay).

14.3.4 Shaw lane will be stopped up at the existing crossing of the WCML and a diversion route provided to A515 Lichfield Road.

14.3.5 Alternative temporary routes for the following PRow will be required and permanently realigned , namely:

- Drayton Bassett footpath 11, north of A453
- Hints footpath 9, north of Bangley Lane
- Hints footpath 8 to join the realigned Hints Footpath 9
- Whittington Footpath 16 at Whittington Heath Golf club
- Whittington Footpath 17 (Sandy Lane)
- Alrewas Footpath 44 north of Wood End Lane.

14.3.6 In addition to the above, permanent realignments are required for:

- Drayton Bassett Bridleway 10, which runs along Shirrall Drive
- Heart of England Way waymarked route over Drayton Lane overbridge
- Hints footpath 14 south of Brockhurst Lane
- Hints footpath 13 will be closed and diverted via Hints footpath 14
- Hints footpath 11 north of Brockhurst Lane
- Hints footpath 19 and 0.378, south of Watling Street
- Hints Bridleway 4 across the A5
- Swinfen and Packington Bridleway 7 and 5 as they cross Flats Lane
- Swinfen and Packington Bridleway 8 south of A51 Tamworth Road
- Whittington Bridleway 20 between Capper's Lane and Broad Lane
- Streethay Footpath 6
- Alrewas Footpath 31 south of Wood End Lane
- Kings Bromley Footpath 0.392 north of Wood End Lane
- temporary closure of Kings Bromley Footpath 6, east of B5014 Lichfield Road, with permanent reinstatement in a new extended underpass
- National Cycle Route 54 which currently uses Netherstowe Lane and Wood End Lane.

14.3.7 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

15.1.1 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

#### Testing and classification of materials

15.2.1 The 'basic characterisation'<sup>8</sup> 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<sup>9</sup> 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 Disposal<sup>10</sup>; and
- WM3 – Guidance on the classification and assessment of waste (1st edition 2015)<sup>11</sup>.

#### Transport of waste and materials

15.2.4 Excavated material produced in LDC is likely to be surplus to the requirements of the Scheme. Surplus excavated material will be managed in accordance with the waste hierarchy as described above and the HS2 Excavated Materials Policy, which states:

15.2.5 *'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...'*

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<sup>8</sup> 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.

<sup>9</sup> CL:AIRE Definition of Waste: Development Industry Code of Practice, version 2, March 2011

<sup>10</sup> Environment Agency (2013), *Waste Sampling and Testing for Disposal to Landfill, March 2013*.

<sup>11</sup> Environment Agency (2015), Technical Guidance WM3 – Guidance on the classification and assessment of waste (1st edition 2015) (1st Edition 2015).

- 15.2.6 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.
- 15.2.7 Excavated material from LDC will be transported by rail where reasonably practicable to do so. If rail transport is not reasonably practicable material will be transported by road.

## 16 Water resources and flood risk

- 16.1.1 General control measures relating to water resources and flood risk are provided in Section 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: alluvium (Secondary A aquifer); river terrace deposits 2 (Secondary A aquifer); river terrace deposits 3 (Secondary A aquifer); Bromsgrove Sandstone Formation (Principal aquifer); Kidderminster Formation (Principal Aquifer); Hopwas Breccia Formation (Principal Aquifer); Salop Formation (Enville Member) (Secondary A aquifer); Mercia Mudstone Group (Secondary B aquifer); glaciofluvial sheet deposits (Secondary A aquifer); Undifferentiated deposits (Head) (Secondary Undifferentiated aquifer) and River terrace deposits (Secondary A aquifer).
  - Source Protection Zone (SPZ): The northern extent of the Scheme, from Black Brook to the north of this study area, lies within a Total Catchment SPZ 3; a groundwater SPZ1 is present in the vicinity of Lichfield Trent Valley Station and is surrounded by an SPZ2 (see Volume 5: MapWR-02-022). Groundwater SPZ3 is designated where the Kidderminster Formation and the Bromsgrove Sandstone Formation principal aquifers are present in the southern half of the study area; the study area also encroaches on an SPZ1 and SPZ2 between Tewnals Lane and Hanch Farm to the south-east of Handsacre.
  - Surface water features: Gallows Brook and tributaries, tributaries of River Tame, tributary of Langley Brook, Bourne Brook and tributaries, Black Brook, tributary to Swinfen Lake, tributary to Brook Leasow, drain feeder to Fisherwick Brook, Wyrley and Essington Canal, Mare Brook and tributaries; Trent and Mersey Canal, Curborough Brook, tributary of River Trent, Coventry Canal.
  - Water dependent habitats: Botley House to Bourne Bridge; Ford (Oxbow Woodland) to Botley House, Bourne Brook Corridor; Snakes Hill and River Oxbow, Black Brook; Black Brook Corridor: Black Brook Bridge – Heart of England Way Biological Alert Site (BAS); Moor Covert Site of Biological Importance (SBI); Freeford Manor and Swinfen Park SBI; Big Lyntus (ancient woodland); Tomhay Wood (ancient woodland); Whittington Heath Golf Course

SBI; Fradley Wood BAS, Trent and Mersey Canal SBI and Woodend Lock SBI.

- Abstractions: Licensed surface water abstractions from a tributary to the River Tame, Bourne Brook, Black Brook, Packington Brook and springs. Licensed groundwater abstractions from Enville Member, Either Alluvium or Mercia Mudstone Group, Bromsgrove Sandstone Formation.
- 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.

16.2.2 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:

- Black Brook
- tributaries of the River Trent
- Curborough Brook
- Bourne Brook.

16.2.3 The Contractor will have due regard to the following local flood water receptors and their respective flood histories:

- Mill Farm at Cappers Lane, south bank of the Black Brook at risk from river flooding
- an area near Oak Farm potentially at risk from sewer flooding
- areas at risk of surface water flooding, as shown on the Environment Agency's Updated Flood Maps for Surface Water (These are mostly associated with watercourses.)

### **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 or surface water from sewers in the surrounding area.

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 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<sup>72</sup>. 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.
- 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 Cuttings (both retained and open) in the area may need to be excavated below the natural water table, although this is uncertain in the absence of detailed ground investigation. The impact of both temporary and permanent dewatering will be re-assessed as more information becomes available and mitigation measures identified. Mitigation measures may include re-infiltration of abstracted groundwater, pumping to support sensitive features or the use of engineering control, such as grouting or secant piling to reduce the amount of water flowing from the aquifer.
- 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.

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<sup>72</sup>Environment Agency (2001), Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution



## Appendix 1: Glossary of Terms

AP	Additional Provision
CFA	Community Forum Area
CoCP	Code of Construction Practice
Contractor	The Contractor on a construction site responsible for planning, managing and co-ordinating 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.
CPC	Safe Urban Driving Certificate of Professional Competence
DRI	Demolition Recovery Index
ES	Environmental Statement
EMS	Environmental Management System
FORS	Fleet Operators Recognition Scheme
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

LTMP	Local Traffic Management Plan
LWS	Local Wildlife Site
NBRI	New Build Recovery Index
Nominated Undertaker	The body or bodies appointed to implement the powers of the hybrid Bill to construct and maintain the railway.
PFRA	Preliminary Flood Risk Assessment
Proposed Scheme	The Proposed Scheme to which this CoCP 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 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).
PRoW	Public rights of way
RRVs	Road Rail Vehicles
RTMP	Route-wide Traffic Management Plan
SBI	Site of Biological Importance
Scheme	The Scheme to which this CoCP 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 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).
SES	Supplementary Environmental Statement
SFRA	Strategic Flood Risk Assessment

SLI	Site of Local Importance
SMI	Site of Metropolitan Importance
SPZ	Source Protection Zone
SRP	Soil Resources Plan
SSMP	Site Specific Management Plan
TfL	Transport for London
TMP	Traffic Management Plan
TPC	Traffic Plan Coordinator

## Appendix 2: Worksite locations and boundaries

Work site locations and boundaries can be found on the following drawings:

Drawing number	Drawing title	Chainage
C223-CSI-EV-DPL-030-523500-AP05	Construction Phase SES4 and AP5 ES	173+000
C223-CSI-EV-DPL-030-523502-AP04	Construction Phase SES3 and AP4 ES	L1
C223-CSI-EV-DPL-030-523510-AP05	Construction Phase SES4 and AP5 ES	173+000
C223-CSI-EV-DPL-030-523512-AP04	Construction Phase SES3 and AP4 ES	L1
C223-CSI-EV-DPL-030-523711-AP04	Construction Phase SES3 and AP4 ES	175+000
C223-CSI-EV-DPL-030-523900-AP04	Construction Phase SES3 and AP4 ES	176+000
C223-CSI-EV-DPL-030-523901-AP04	Construction Phase SES3 and AP4 ES	R1
C223-CSI-EV-DPL-030-523902-AP04	Construction Phase SES3 and AP4 ES	R2
C223-CSI-EV-DPL-030-524100-AP04	Construction Phase SES3 and AP4 ES	177+000
C223-CSI-EV-DPL-030-524101-AP05	Construction Phase SES4 and AP5 ES	L1
C223-CSI-EV-DPL-030-524102-AP04	Construction Phase SES3 and AP4 ES	L2
C223-CSI-EV-DPL-030-524300-AP05	Construction Phase SES4 and AP5 ES	179+000
C223-CSI-EV-DPL-030-524500-AP04	Construction Phase SES3 and AP4 ES	181+000
C223-CSI-EV-DPL-030-524700-AP04	Construction Phase SES3 and AP4 ES	182+000
C223-CSI-EV-DPL-030-524710-AP04	Construction Phase SES3 and AP4 ES	182+000
C223-CSI-EV-DPL-030-524900-AP04	Construction Phase SES3 and AP4 ES	183+000
C223-CSI-EV-DPL-030-524912-AP04	Construction Phase SES3 and AP4 ES	L1
C223-CSI-EV-DPL-030-524913-AP04	Construction Phase SES3 and AP4 ES	L2
C223-CSI-EV-DPL-030-524914-AP04	Construction Phase SES3 and AP4 ES	L3
C223-CSI-EV-DPL-030-524922-AP04	Construction Phase SES3 and AP4 ES	L1
C223-CSI-EV-DPL-030-524923-AP04	Construction Phase SES3 and AP4 ES	L2
C223-CSI-EV-DPL-030-524924-AP04	Construction Phase SES3 and AP4 ES	L3
C223-CSI-EV-DPL-030-525100-AP04	Construction Phase SES3 and AP4 ES	185+000
C223-CSI-EV-DPL-030-525101-AP04	Construction Phase SES3 and AP4 ES	R1
C223-CSI-EV-DPL-030-525102-AP04	Construction Phase SES3 and AP4 ES	R2
C223-CSI-EV-DPL-030-525103-AP04	Construction Phase SES3 and AP4 ES	R3
C223-CSI-EV-DPL-030-525104-AP04	Construction Phase SES3 and AP4 ES	R4
C223-CSI-EV-DPL-030-525300-AP04	Construction Phase SES3 and AP4 ES	187+000
C223-CSI-EV-DPL-030-525301-AP04	Construction Phase SES3 and AP4 ES	
C223-CSI-EV-DPL-030-525500-AP05	Construction Phase SES4 and AP5 ES	188+000
C223-CSI-EV-DPL-030-525700-AP05	Construction Phase SES4 and AP5 ES	189+000
C223-CSI-EV-DPL-030-525701-AP04	Construction Phase SES3 and AP4 ES	R1
C223-CSI-EV-DPL-030-525702-AP04	Construction Phase SES3 and AP4 ES	L1
C223-CSI-EV-DPL-030-525900-AP04	Construction Phase SES3 and AP4 ES	191+000
C223-CSI-EV-DPL-030-525901-AP04	Construction Phase SES3 and AP4 ES	R1
C223-CSI-EV-DPL-030-525902-AP05	Construction Phase SES4 and AP5 ES	L1
C223-CSI-EV-DPL-030-525903-AP04	Construction Phase SES3 and AP4 ES	Off route WCML

C223-CSI-EV-DPL-030-525904-AP04	Construction Phase SES3 and AP4 ES	Off route WCML
C223-CSI-EV-DPL-030-525905-AP04	Construction Phase SES3 and AP4 ES	L2
C223-CSI-EV-DPL-030-525906-AP04	Construction Phase SES3 and AP4 ES	L1
C223-CSI-EV-DPL-030-526100-AP04	Construction Phase SES3 and AP4 ES	192+000
C223-CSI-EV-DPL-030-526110-AP04	Construction Phase SES3 and AP4 ES	192+000
C223-CSI-EV-DPL-030-528700-AP04	Construction Phase SES3 and AP4 ES	Off route
C223-CSI-EV-DPL-030-528900-AP04	Construction Phase SES3 and AP4 ES	Off route
C223-CSI-EV-DPL-030-528901-AP04	Construction Phase SES3 and AP4 ES	L1 Off route
C223-CSI-EV-DPL-030-529100-AP04	Construction Phase SES3 and AP4 ES	Off route
C223-CSI-EV-DPL-030-529300-AP04	Construction Phase SES3 and AP4 ES	Off route
C223-CSI-EV-DPL-030-529500-AP04	Construction Phase SES3 and AP4 ES	Off route
C223-CSI-EV-DPL-030-529700-AP04	Construction Phase SES3 and AP4 ES	Off route

## Appendix 3: Non-exhaustive list of Community Groups in LDC

- Local Member of Parliament
- HS2 Community Forums 21: Drayton Bassett, Hints and Weeford and 22: Whittington to Handsacre
- Highways England
- A5 Partnership
- landowners/occupiers directly affected by the Scheme
- Joint Local Access Forum for Staffordshire, Stoke-on-Trent and Wolverhampton
- LDC
- Staffordshire County Council
- Drayton Bassett Parish Council
- Fazeley Parish Council
- Colton Parish Council
- Hints and Canwell Parish Council
- Weeford Parish Council
- Swinfen and Packington Parish Council
- Whittington and Fisherwick Parish Council
- Fradley and Streethay Parish Council
- Lichfield City Council
- Curborough Elmhurst Farewell and Chorley Parish Council
- Kings Bromley Parish Council
- Alrewas Parish Council
- Longdon Parish Council
- Armitage with Handsacre Parish Council
- Darnford Moors Golf Club
- Lichfield Cruising Club

- Coventry Canal Society
- Kings Orchard Marina
- Horsepower Equestrian Centre, Streethay
- Sustrans
- Kings Bromley Marina
- Lichfield and Hatherton Canals Restoration Trust
- Tamworth Library
- The Ramblers (Local Group)
- National Farmers Union
- Staffordshire Wildlife Trust
- Hints Village Hall
- Woodland Trust
- Whittington Heath Golf Club
- British Horse Society
- The Lichfield Historical Society
- Roxane UK Ltd
- Peak and Northern Footpath Society
- Canal and River Trust
- Lichfield District Strategic Partnership
- RSPB Lichfield and District Local Group
- Lichfield and District Council for Voluntary Services
- National Trust
- Lichfield City Cycling Club
- Flats Lane and Knox's Grave Lane Residents Group
- DMS Whittington

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

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