

High Speed Two Phase 2a: West Midlands to Crewe
Working Draft Environmental Impact Assessment Report
Volume 1: Glossary of terms and list of abbreviations

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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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A report prepared for High Speed Two (HS2) Limited:

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1 Glossary of terms

Term	Definition
10mm settlement contour	The area in which ground settlement is estimated to be 10mm in depth.
abnormal possessions	See 'possession'.
absolute vibration criteria	Limits (or trigger levels) that identify whether vibration is likely to impact on a person's activities or the operation of vibration sensitive equipment.
abutment	A point where two structures meet, which support or anchor the end of a bridge.
accommodation bridge	A bridge under or over the route of the Proposed Scheme that serves an area of land or residential property and is not considered a public highway.
accommodation/access road or track	A new or altered access road or track serving a piece of land or residential property affected by the Proposed Scheme. Such accesses are not public highways.
accumulated temperature	The median accumulated temperature above 0°C from January to June which gives a measure of heat energy input and soil drying potential and correlates with crop growth and yield.
additional provision	An amendment to a hybrid Bill being considered by Parliament. Additional Provisions cover changes which involve the acquisition or use of land outside the original limits of the Bill, additional access rights, or other extensions of the powers conferred by the Bill.
adit	A horizontal or near-horizontal passage or tunnel that provides access to and from underground workings in a tunnel.
aggregate	Granular material (e.g. sand and gravel or crushed rock) that can be used for building and/or civil engineering purposes (e.g. to produce concrete).
Agricultural Land Classification	The system devised and introduced by the Ministry of Agriculture, Fisheries and Food to classify agricultural land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. Land is graded from 1 (excellent quality) to 5 (very poor quality), with grade 3 subdivided into agricultural subgrades 3a and 3b. See 'best and most versatile land', 'Grade 1-5' and 'Subgrade 3a and 3b'.
agri-environment scheme	A mechanism by which landowners and other individuals and bodies responsible for land management can be incentivised to manage their land in a manner sympathetic to the environment.
air quality action plan	A plan that must be compiled by a local authority if it declares an air quality management area.
air quality exceedance	An instance of pollutant concentrations exceeding an air quality standard.

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Term	Definition
air quality limit value	A maximum concentration to be achieved in the atmosphere, either without exception or with a permitted number of exceedances. Limit values are defined in European Union Directives and implemented in United Kingdom legislation.
air quality management area	An area within a local authority boundary where the air quality objectives are not likely to be achieved. The local authority is required to declare the area as an air quality management area and to prepare a local air quality action plan.
air quality objective	Objectives are policy targets generally expressed as a maximum ambient pollutant concentration to be achieved. The objectives are set out in the UK Government's Air Quality Strategy for the key air pollutants.
air quality sensitive receptors	People, property, species or designated sites for nature conservation that may be at risk from exposure to air pollutants potentially arising as a result of a proposed development.
air quality standard	Air quality limit values and objectives.
as low as reasonably practicable	A principle that involves weighing a risk against the time and cost of controlling it.
alluvial deposits	Natural materials deposited within and adjacent to rivers.
amenity	The benefits of enjoyment and well-being that are gained from a resource in line with its intended function. Amenity may be affected by a combination of factors such as: sound, noise and vibration; dust/air quality; traffic/congestion; and visual impacts.
ambient sound	The all-encompassing sound at a given location and time. It will generally include sound from many sources near and far. Ambient sound can be quantified in terms of the equivalent continuous sound pressure level, $L_{pAeq,T}$.
anaerobic	Absence of oxygen.
ancient woodland	Land that has been continually wooded since at least 1600.
ancillary works	Activities which may take place prior to work under the main construction contract. This could include: demolition, site clearance and the diversion and upgrade of utilities.
annual average rainfall	Average amount of precipitation falling at a specified site recorded by the Meteorological Office. It gives a measure of the overall wetness of the local climate.
appraisal of sustainability	An assessment of the impact of plans, policies and programmes from an environmental, economic and social perspective.
appropriate assessment	An assessment (required under regulation 48 of the Conservation (Natural Habitats, etc.) Regulations 1994) of the effects of a plan or project on the Natura 2000 network of European sites of nature conservation significance. The assessment focuses on the plan or project's implications for the site and any potential adverse impacts on its integrity.

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Term	Definition
aquifer	A geological formation that is sufficiently porous and permeable to store and yield a significant quantity of water to a borehole, well or spring.
arcGIS	Computer software-based geographic information system used for: creating maps; analysing information that has been mapped; and managing and compiling geographic data.
archaeological anomaly	A location identified during a geophysical survey that indicates the presence or possible presence of an archaeological feature or features.
archaeological potential	A location where the data collected and reviewed indicate that archaeological assets may be present.
archaeological priority area	An area specified by a local planning authority to help protect archaeological remains that might be affected by development.
area of outstanding natural beauty	An area designated under section 82(1) of the Countryside and Rights of Way Act 2000 for the purpose of conserving and enhancing its natural beauty.
at-grade	At the same height (e.g., when a railway line is at the same height as the existing ground level).
attenuation tank	An attenuation tank is usually installed within a drainage system just prior to the point of discharge from a site to help control the rate of water flow during high flow conditions.
auger	A drilling device, or drill bit, that usually includes a rotating helical screw blade. The rotation of the blade causes the material to move out of the hole being drilled.
auto-transformer station	An installation that accommodates switchgear and associated equipment. Auto-transformer stations are located in the railway corridor at approximately 5km (3 mile) intervals. They allow the distance between auto-transformer feeder stations to be increased.
auto-transformer feeder station	Permanent compounds located next to railway lines. They contain equipment that enables electrical power to be transferred between the National Grid network and the rail line.
balancing pond	Part of a drainage system that is used to temporarily store, and thereby attenuate, the flow of surface water run-off.
ballast	Graded stone, used for drainage and to form the track bed upon which railway sleepers are laid.
barrette retaining wall	A retaining structure constructed from reinforced concrete columns of a rectangular plan form with the long axis in the direction of retention.
basal layer	Unweathered parent material beneath subsoil. A layer upon which subsoil may be re-spread.

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Term	Definition
base flow index	The proportion of a river's flow that comes from groundwater sources. Base flow sustains a river flow in dry weather.
baseline	Existing environmental conditions present on, or near a site, against which future changes can be measured or predicted.
beam bridge	A beam bridge consists of structural sections spanning longitudinally between piers or abutments.
bedrock	Rock that underlies loose deposits such as soil or alluvium.
bentonite	A natural clay that, when mixed with water, swells and forms a thixotropic gel (a particular type of viscous behaviour exhibited by some liquids). It can be used temporarily to support trenches or retaining walls, and helps to prevent collapse when they are being backfilled (i.e. refilled) or concreted.
best and most versatile land	Land defined as grade 1, 2 or 3a of the Agricultural Land Classification. This land is considered the most flexible, productive and efficient and is most capable of delivering crops for food and non-food uses.
best practicable means	Defined in the Control of Pollution Act 1974 and Environmental Protection Act 1990. Used to describe measures that are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.
biodiversity	The variety of life in the world or in a particular habitat or ecosystem.
biodiversity action plan	A nationally established programme that seeks to protect and restore threatened species, habitats and biological systems.
bipolar anomaly	An anomaly that is composed of both a positive response and a negative response identified during a geophysical survey. It can be made up of any number of positive responses and negative responses. For example a buried pipeline consisting of alternating positive and negative anomalies is said to be bipolar.
boom-mounted hydraulic breaker	Demolition hammers or shears fitted to hydraulic excavator plant. The hammers/shears are often on long-reach booms to increase the demolition reach.
bored tunnel	A tunnel constructed using a tunnel boring machine.
borehole	A hole bored into the ground, usually as part of investigations, typically to test the depth and quality of soil, rock and groundwater. A borehole can also be used to dewater the ground.
bridge deck	The road, railway or pedestrian walkway that forms the surface of a bridge.
bridge soffit	The underside of a bridge.
built heritage	A structure or building of historic value. These structures are visible above ground level.

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Term	Definition
bund	An embankment that acts as a visual or noise screen, or as a barrier to control the spillage of fluids.
buried heritage	A heritage asset beneath ground level.
Business and Local Economy Fund	A fund established by HS2 Ltd to add benefit over and above committed mitigation and statutory compensation to support local economies that are demonstrably disrupted by the construction of HS2.
cantilever	A structure supported or fixed at one end only.
calcareous soil	Soil containing accumulations of calcium and magnesium carbonate, formed by the weathering of calcareous rocks and fossil shell beds.
captive trains	High speed trains that are designed only to be used across the European high speed rail network.
carbon budget	The total quantity of greenhouse gas emissions permitted in the United Kingdom over a specified period.
carbon dioxide equivalent	A measure used to compare the emissions from various greenhouse gases based on their global warming potential relative to that of carbon dioxide.
carbon footprint	The total carbon dioxide emissions associated with a particular policy or development.
catalytic effects (economic)	The stimulation of additional economic activity through the introduction of new infrastructure, such as a high speed rail network.
catenary system	General term used to describe all the overhead line equipment in the rail corridor.
Central Association of Agricultural Valuers	A specialist professional body representing, qualifying and briefing members practicing a diverse range of agricultural and rural work throughout the UK.
chainage	The distance (measured in metres) along the centre line of the HS2 route from a defined start point at Euston station, London.
circa	Meaning 'approximately'. Often used in a historic context in reference to a date.
civil engineering	A branch of engineering that deals with the design, construction and maintenance of the physical and naturally built environment. Examples of civil engineering works include construction of roads, railways and dams
clay	An inorganic component of soil derived from the weathering of rock. It comprises particles less than 0.002mm in equivalent diameter.
classic compatible trains	HS2 trains that will run on both the high speed track and the existing rail network.
classic line	The existing UK rail network (excluding HS1).

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climate	The climate can be described simply as the 'average weather', typically looked at over a period of 30 years. It can include temperature, rainfall, snow cover, or any other weather characteristic.
climate change	A change in the state of the climate, which can be identified by changes in average climate characteristics that persist for an extended period – typically decades or longer.
climate change adaptation	The adjustment in natural or human systems in response to actual or expected climatic changes or their effects, which moderates harm or exploits beneficial opportunities.
climate change resilience	The capacity of natural and human systems to retain their original form and function, and to survive and adapt in the context of the stresses and shocks imposed upon them by climate change.
climate change mitigation	Action to reduce the likelihood of an event occurring or to reduce the impact if it does occur. This can include reducing the causes of climate change (e.g. emissions of greenhouse gases), as well as reducing future risks associated with climate change.
Climate Change Risk Assessment	A Government-commissioned assessment of the risks posed to the United Kingdom by the changing climate.
code of construction practice	A document setting out the measures and standards to which a developer or contractor must adhere in order to provide effective planning, management and control of potential impacts on individuals, communities and the environment during construction.
cofferdam	A temporary enclosure built within water-filled ground or a body of water to regulate the in-flow and out-flow of water.
combinable crops	All types of crop gathered using a combine harvester.
combined two-way vehicle trips	A vehicle movement that comprises an outward journey and a return journey.
combustion plant	An installation that combusts fuel to generate energy.
committed development	A development that has full or outline planning permission, or is allocated in an adopted development plan.
Committee on Climate Change	An independent advisory body, established under section 32 of the Climate Change Act 2008, tasked with helping the UK Government set and meet carbon budgets and adapt to climate change.
community area	Defined areas along the proposed HS2 Phase 2a route (e.g. South Cheshire community area). They are used as a geographical basis for reporting local community and environmental impacts and effects in the environmental impact assessment report.

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Term	Definition
compensation (ecology)	Measures taken to make up for the loss of, or permanent damage to, biological resources by providing replacement areas. Any replacement area should be similar to that lost or damaged, or, with appropriate management, have the ability to reproduce the ecological functions and conditions of the biological resources that have been lost or damaged.
Compensation Code	See 'National Compensation Code'.
Community and Environment Fund	A fund established by HS2 Ltd to add benefit over and above committed mitigation and statutory compensation to communities along the route that are demonstrably disrupted by the construction of HS2
concentration response	A known functional relationship between exposure to a stressor (e.g. a pollutant or chemical) and the effect on a biological receptor (e.g. number of people who experience ill health or death).
conceptual site model	The method used to identify the various types of risk relating to contaminated land. The conceptual site model includes: categorisation of sources of contamination; categorisation of potential receptors; and identification of potential contamination pathways (i.e. linking sources to receptors).
concrete batching plant	A machine that combines various ingredients to form concrete.
confined aquifer	An aquifer that is confined between two layers of soil or rock that are much less pervious than the aquifer.
conglomerate	A rock that contains gravel or cobble-sized material within a finer grained matrix.
connectivity (ecology)	A measure of the functional availability of the habitats needed for a particular species to move through a given area. Examples include the flight lines used by bats to travel between roosts whilst foraging.
conservation	The preservation or enhancement of a species or building/structure.
conservation area	An area designated under Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990 as being of special architectural or historic interest and with a character or appearance which is desirable to preserve or enhance.
construction person year	Used to report construction labour, where one construction person year represents the work done by one person in a year, comprising a standard number of working days.
construction plant	Portable construction machinery and equipment.
construction sidings	Sites with connections to the National Rail network to allow excavated materials to either join the rail network from the Proposed Scheme construction areas, or to leave the rail network to enter the construction areas. Facilities at construction sidings will include offices and rail sidings to provide for the loading or unloading of construction material from rail wagons.

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Term	Definition
construction worksites	Sites where the construction of the various elements of the Proposed Scheme (e.g. viaducts and tunnels) is undertaken.
contiguous bored pile wall	Closely spaced, bored piles used to form an underground wall, for the construction of a deep basement or green tunnel.
continuous monitoring station	An air quality monitoring site that continuously measures the levels of pollutants.
controlled waters	Rivers, streams, estuaries, lakes, canals, ditches, ponds and groundwater as far out as the UK territorial limit. The statutory definition is provided in Section 104 (1) of the Water Resources Act 1991 and Section 30A (d) of the Control of Pollution Act 1974.
conurbation	A region comprising a number of cities, large towns and other urban areas that, through population growth and physical expansion, have merged to form one continuous urban and industrially developed area.
Country Land and Business Association	A membership organisation for owners of land, property and business in rural England and Wales.
crop-adjusted available water capacity	A measure of the moisture that plants can extract from the soil. It is related to the texture, structure, stoniness and depth of the soil that roots can exploit.
Crossrail	A new east-west rail line linking Reading and Heathrow Airport in the west, to Shenfield and Abbey Wood in the east, via tunnels under central London.
Crossrail 2	A proposed new rail line linking Surrey and Hertfordshire, via tunnels under central London.
Considerate Constructors Scheme	A UK-wide scheme promoting good construction site practice. Its codes of considerate practice commit the users of registered sites to be: considerate and good neighbours; respectful; environmentally conscious; responsible; and accountable.
county wildlife site	A site of important nature conservation value within a county context, but which is not protected under the Wildlife and Countryside Act 1981.
culvert	A large pipe or small underbridge carrying a watercourse under a road or railway.
cumulative	A combination of effects. The EIA Scope and methodology report for HS2 Phase 2a defines a cumulative effect as: "incremental effects that result from the accumulation of a number of individual effects, either caused by the Proposed Scheme (intra-project effects) or by other existing and/or approved projects which would be under construction at the same time as Phase 2a or built later (inter-project effects)."
curtilage	The area of land associated with the use of a building for a particular purpose.
cut-and-cover tunnel	A tunnel constructed by: excavating a cutting; constructing a box-type structure; and reinstating the ground over the top to its original level.

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Term	Definition
cutting	A linear excavation of soil or rock to make way for a new railway or road. Cuttings help reduce the noise and/or visual impact of passing trains or road vehicles.
cryoturbation	The mixing of soils due to alternate freezing and thawing of water (see also: 'solifluction').
decibel(s)	A unit used to express relative differences in sound power or intensity. There is a million to one ratio in sound pressure (measured in Pascal (Pa)) between the quietest audible sound and the loudest tolerable sound. The decibel (dB) scale, based on a logarithmic ratio, is used in sound measurement because of this wide range. Audibility of sound covers a range of approximately 0-140dB.
decibel(s) A-weighted	Instrumentation used to measure sound is weighted to represent the performance of the ear, which does not respond uniformly to sound across the detectable frequency range. This is known as the 'A weighting' and is written as 'dB(A)'. Instrumentation used to measure sound is weighted to represent the performance of the ear, which does not respond uniformly to sound across the detectable frequency range. This is known as the 'A weighting' and is written as 'dB(A)'.
deck beam	A horizontal structural support element that is capable of withstanding a vertical load.
deck slab	The material that lies on top of the deck beams to create a surface.
Defra	The Government Department for Environment, Food and Rural Affairs. The department is responsible for safeguarding the natural environment, supporting the food and farming industry and sustaining a thriving rural economy.
delay (pedestrians)	Change in the 'person-minutes' of the journey times of pedestrians and other non-motorised travellers.
delay (traffic)	An increase in journey time for drivers and passengers due to increased congestion.
Department for Transport	Government department responsible for transport issues in the UK (where powers have not been devolved).
deposition index	A dimensionless index value that indicates the extent of sediment coverage on a stream bed.
design development	Process in which technical specialists (e.g. engineering, environmental, socio-economic, community and health specialists) collaboratively refine the design for the various elements of HS2 Phase 2a.
design life	The life expectancy of a proposed development.
development plan document	Documentation that seeks to guide development and planning in a local authority area for a set period.
diamicton	Very poorly sorted sediment, often the result of glacial activity. It differs in structure, texture and thickness.

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diaphragm walls	Embedded walls inserted into the ground. They can be used as foundation walls, groundwater barriers or to isolate areas of contaminated ground.
diffusion tube	A passive device used in air quality monitoring to measure weekly or monthly average pollutant concentrations.
dipolar anomaly	A single positive anomaly with an associated negative response identified during a geophysical survey. There should be no separation between the two polarities of response. These responses will be created by a single feature. A very strong anomaly is likely to be caused by a ferrous object.
Directive	A legal act of the European Union. Legal obligations imposed on European member states by the European Commission following approval by the European Parliament and European Council.
discharge consent	Permission granted by the Environment Agency to discharge sewage or trade effluent directly into surface waters, groundwater or the sea.
displacement (economic)	Loss of local economic activity as a direct consequence of a proposed development.
diversion	Used throughout this EIA Report to refer to a significant change to the route or direction of a road due to the location of the route of the Proposed Scheme. (See also: 'realignment'.)
dive under	A railway junction at which one or more diverging or converging tracks in a multiple-track route pass under a structure containing other tracks on the route to avoid conflicting train movements.
down line	The line of the route heading away from Euston Station, London.
drop inlet culvert	A form of culvert used on sloping ground where the water level has to be lowered to pass under a railway or road.
droughtiness	A physical limitation to the agricultural use of soils. It is a defined calculation in the Agricultural Land Classification guidelines which uses soil and climatic parameters to provide an estimate of likely moisture stress in 'standard' crops. Moisture stress can arise when the crop's requirements for water exceed the available water capacity of the soil.
dry valley	A valley, formed by water erosion, with no permanent surface stream. These valleys typically occur in areas where porous rock (i.e. rock which absorbs water, such as chalk and limestone) is present.
dust	All airborne particulate matter.
earthworks	The removal or placement of soils and rocks such as in cuttings, embankments and environmental mitigation, including the in-situ improvement of soils/rocks to achieve desired properties.

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Term	Definition
East Coast Main Line	The existing rail route connecting London King's Cross, Peterborough, Doncaster, Wakefield, Leeds, York, Darlington, Newcastle, Edinburgh and Aberdeen.
ecological status	The state of a water body, derived from a number of factors, including: the abundance of aquatic flora and fauna; nutrient availability; salinity; temperature; and chemical pollution levels.
economically active	People who are either in employment or unemployed but actively seeking employment.
ecosystem	A biological community of interacting organisms (e.g. plants and animals) and their environment.
effect	Used throughout this environmental impact assessment report to refer to the consequence of an impact to the receiving environment (see also: 'impact').
effluent	Liquid waste or sewage.
electricity pylon	A tall lattice-like structure (usually made of steel) that is used to support overhead power lines. Also known as a transmission tower.
electromagnetic field	The field of force associated with electric charge in motion, which has both electric and magnetic components and contains electromagnetic energy.
electromagnetic interference	Disturbance that affects an electrical system due to magnetic and electric fields, electromagnetic induction or electromagnetic radiation emitted from an external source.
English Woodland Grant Scheme	A portfolio of grants managed by the Forestry Commission to help promote the stewardship of existing woodlands, the creation of new woodlands and the delivery of public benefits from England's woods.
embankment	Artificially raised ground, commonly made of rock or compacted soil, on which a new railway or road is constructed.
EMC zone	A bounded area in which specific levels of electromagnetic energy exist. Some EMC zones contain higher levels of electromagnetic energy than others. In the railway environment the zone containing most energy in these EMC zones exists on the trackside of the railway close to traction or non-traction power distribution equipment.
employment density ratio	Standard average floorspace per full-time equivalent member of staff, which varies by building use. It is used to estimate the number of jobs that are accommodated in any given building.
employment rate	The proportion of 16-74 year-old residents in employment. Employment comprises the proportion of the total resident population who are 'in employment' and includes full-time students who are employed.
English Heritage	Executive non-departmental public body created under Section 32 of the National Heritage Act 1983. English Heritage separated into two organisations in April

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Term	Definition
	2015: the English Heritage charity, which cares for the National Heritage Collection of more than 400 historic places and their collections; and Historic England, the public body that looks after England's historic environment and helps people understand, value and care for historic places.
entry level stewardship	The basic level of Defra's Environmental Stewardship Scheme, intended to encourage a large number of farmers across a wide area to adopt simple environmental management practices, such as hedgerow management, low-input grassland, buffer strips and more sustainable arable options.
Environment Agency	Government agency established to protect and improve the environment and contribute to sustainable development. Responsibilities include: water quality and resources, flooding and coastal risk management and contaminated land.
environmental impact assessment	A process of systematically assessing the likely environmental effects of proposed development projects. EIA is a legal requirement for certain public and private projects in EU countries under Directive 2014/52/EU.
environmental impact assessment report	A suite of documents, previously referred to as an environmental statement, produced as part of an environmental impact assessment. It must include all information that is reasonably required to assess the likely significant environmental effects of a proposed development.
environmental statement	A suite of documents produced as part of an environmental impact assessment. It must include all information that is reasonably required to assess the likely significant environmental effects of a proposed development.
Environmental Stewardship and Countryside Stewardship	A scheme run by the Department for Environment, Food, and Rural Affairs in England that aims to promote responsible use and protection of the natural environment through conservation and sustainable practices.
equivalent continuous sound pressure level, $L_{pAeq,T}$	An index used internationally for the assessment of environmental sound impacts. It is defined as the notional unchanging level that would, over a given period of time (T), deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating sound levels can be described in terms of an equivalent single figure value.
Euro VI engines	Engines certified to have substantially lower emissions of NO _x and particulate matter than older engines. (Euro VI as defined by EU Directive 2007/46/EC, and amended by subsequent regulations).
European Union Emissions Trading System	A system designed to reduce greenhouse gas emissions using a cap-and-trade framework.
excavated material	Soil, rock and other material that has been removed from the ground during construction.
Exceptional Hardship Scheme	A purchase scheme for property owners whose properties may be affected by the plans for High Speed Two (HS2) between the West Midlands and Crewe (Phase 2a).

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Term	Definition
extreme weather	Unusual, severe or unseasonal weather; or weather at the extremes of the range of weather seen in the past.
false cutting	A means of screening a linear feature (e.g. a railway) by forming embankments on both sides of the feature.
falsework	Scaffolding or other temporary structures used to support construction components until the construction is sufficiently advanced to allow the structure to support itself.
ferrous anomaly	A response obtained from geophysical survey that indicates the presence of ferrous (iron based) material that may result from items within the topsoil or larger buried objects such as pipes.
field capacity days	A meteorological parameter used to quantify the duration of the period when soils are wet. Soils usually return to field capacity during the autumn or early winter. The field capacity period, measured in days, ends in the spring when evapotranspiration exceeds rainfall and a moisture deficit begins to accumulate in the soil. Opportunities for mechanised fieldwork are then possible without damaging the soil.
fill	Material used to artificially raise existing ground levels.
floodplain	Land adjacent to a watercourse that is subject to flooding.
Flood Zones 1, 2 and 3	A system devised by the Environment Agency for classifying flood zone areas. The zones are: - Flood Zone 1: land outside the floodplain. There is little or no risk of flooding in this zone; - Flood Zone 2: the area of the floodplain where there is a low to medium flood risk; and - Flood Zone 3: the area of the floodplain where there is a high risk of flooding.
footfall	The total number of pedestrians walking past a specific point (in either direction) within a period of time.
Forestry Commission	The Government department responsible for the protection, expansion and management of forests and woodland in England and Scotland.
formation (land quality)	A group of related rock strata with some common properties.
formwork	Temporary or permanent moulds into which concrete or similar materials are poured.
fragmentation (ecology)	The breaking-up of a habitat, ecosystem or land-use type into smaller parcels.
freeboard allowance	The height from the maximum design level of a watercourse to:

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Term	Definition
	<p>- the adjacent banks of an open channel, to provide a factor of safety against flooding; or</p> <p>- the soffit (underside) of any culvert or bridge above, to minimise the risk of blockage by floating debris, etc.</p>
full-time equivalent (employment)	Combines full- and part-time employment to provide a standard measure of employment by working week. Someone who works 2.5 days a week, for instance, would be counted as 0.5 full-time equivalent.
future baseline	The situation that would prevail if the proposed development that is the subject of the environmental impact assessment does not proceed. The predicted impacts of the development are compared against this theoretical scenario.
gabion	Large wire basket filled with rock or aggregate, used multiply to construct retaining walls or for erosion protection.
gazetteer	A dictionary that lists geographical features such as road names, hills, rivers and places.
geophysical survey	The collection of information associated with subsurface features (e.g. buried archaeology) using various techniques (such as magnetometer—a survey technique used to detect and map changes in the earth's magnetic field caused by concentrations of ferrous-based minerals within soils and subsoil, and buried materials). They enable the identification and survey of subsurface features without having to excavate.
glacial deposits	Natural materials laid down during the ice ages (i.e. of the Quaternary period).
glacio-lacustrine deposits	Natural materials laid down within lakes during the ice ages (i.e. of the Quaternary period).
Gleying	The process in which anaerobic conditions arising from poorly drained soils result in the reduction of iron and other elements in the soil, causing soils to turn a largely grey-brown or grey colour, with ochreous mottles in localised aerated zones.
Grade 1 (Agricultural Land Classification)	'Excellent' quality agricultural land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown, commonly including top fruit, soft fruit, salad crops and winter-harvested vegetables. Yields are high and less variable than on land of lower quality.
Grade 2 (Agricultural Land Classification)	'Very good' quality agricultural land with minor limitations that affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown. However, on some land in the grade there may be reduced flexibility due to difficulties with the production of more demanding crops, such as winter-harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.
Grade 3 (Agricultural Land Classification)	Land with 'moderate' limitations. This affects the choice of crops that can be grown, the timing and type of cultivation, and harvesting or yield levels. The yields of more demanding crops are generally lower or more variable than on land in grades 1 and 2. See Subgrades 3a and 3b.

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Term	Definition
Grade 4 (Agricultural Land Classification)	'Poor' quality agricultural land with severe limitations that significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops), the yields of which are variable. In moist climates, yields of grass may be moderate to high, but there may be difficulties in utilisation. The grade also includes very droughty arable land.
Grade 5 (Agricultural Land Classification)	'Very poor' quality agricultural land with very severe limitations that restrict use to permanent pasture or rough grazing.
Grade I listed building	A listed building of exceptional interest, sometimes considered to be internationally important.
Grade II* listed building	A listed building of particular importance, of more than special interest.
Grade II listed building	Nationally important buildings that are of special interest.
grade separation	Vertical separation of a transport junction. For example, a bridge to carry vehicles over a railway line.
green belt	A designation for land around certain cities and large built-up areas, which aims to keep this land permanently open or largely undeveloped.
green/brown roof	A specific type of roof that may be partially or fully covered in vegetation to benefit ecology.
green spaces	Areas of natural or semi-natural land such as parks, gardens and woodlands.
green tunnel	A cut-and-cover tunnel with soil spread on top to integrate it into the landscape, thus minimising visual impacts and making the presence of a railway less noticeable. Access tracks and vegetation can be placed on the surface above the tunnel and it can be used for amenity, parkland and agricultural uses etc.
greenhouse gas	A gas such as carbon dioxide, methane, chlorofluorocarbons, nitrous oxide, ozone, and water vapour that contributes to the greenhouse effect by absorbing infrared radiation.
gross direct jobs	Jobs created during different phases of a project. In relation to construction of the Proposed Scheme, gross direct jobs cover the construction workforce. During the operational phase, gross direct jobs refer to jobs directly related to the operation of the Proposed Scheme including the staffing of trains and the depot.
gross domestic product	Measure of the total economic activity in a country.
gross value added	Measure of the contribution to the economy of each individual producer, industry or sector in a country.
ground anchor	A device, usually a steel tube or rod, used in both permanent and temporary applications that is driven into the ground to provide additional support to a structure (such as a retaining wall or foundation), from lateral (sideways) or vertical forces.

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Term	Definition
ground-borne sound	Vibration generated by moving vehicles (e.g. trains) in tunnels. Passing through the ground, it propagates into buildings where it causes building elements to vibrate, causing sound to be radiated inside a building.
ground-borne vibration	Sound generated inside a building by ground-borne vibration.
ground-penetrating radar survey	A non-destructive survey technique used to identify underground features (often utilities services) using radio waves.
groundwater	All water that is below the surface of the ground and within the permanently saturated zone.
groundwater body	A distinct volume of groundwater within an aquifer.
groundwater dependent terrestrial ecosystems	Ecosystems that directly depend upon groundwater to maintain their form and function.
ground gas	Gases such as carbon dioxide and methane that are generated within the ground and/or within landfills (commonly from the breakdown of vegetative matter).
groundwater source protection zone	Areas defined by the Environment Agency that show the risk from contamination/pollution to groundwater sources (such as wells and boreholes) used for drinking water.
grouting shaft	Constructed to allow the injection of grout from horizontal tubes to control ground settlement.
Habitat Suitability Index	A numerical index used to evaluate habitat quality and quantity for a particular species. A value of one represents optimum habitat and a value of zero represents a habitat of no value.
haul roads	Temporary roads provided within a contractor's site area to allow for the movement of construction material, construction machinery and/or construction labour around the site.
head (land quality)	A natural material often containing a wide variety of grain sizes, including angular gravel size fragments, formed by solifluction during the ice ages.
head deposits	Terrigenous sediments formed through a range of slope processes under periglacial conditions. Head deposits are generally composed of a clay matrix with a wide range of sizes of angular rock fragments.
headhouse	The above-ground structure that typically sits at the top of a ventilation shaft or tunnel portal. These structures can be used for housing control equipment or for providing emergency access to tunnels.
headwall	A supporting, protecting or retaining wall built at the front or top of a structure or area.

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Term	Definition
health determinants	Factors affecting health, including the social and economic environment, the physical environment, and a person's individual characteristics and behaviours.
heavy metals	A loosely defined term which refers to a group of metal and metalloids, many of which are toxic to some degree.
heritage asset	A building, monument, site, place, area or landscape of historic value.
hibernaculum	The winter den of a hibernating animal or insect.
higher level stewardship	A specialist element of the Countryside Stewardship Scheme that is targeted at achieving significant environmental benefits in high priority areas, and involves more complex environmental management.
high pressure gas distribution pipeline	A local area gas network which distributes gas at greater than 7bar (unit of pressure).
high pressure gas transmission pipeline	A national network of large diameter pipelines used to transport gas around the network at greater than 7bar. This gas is pumped at high pressure through the use of compressor stations. The gas then leaves the transmission system and enters the distribution network. Within the distribution network, the gas is then transported through a number of reducing pressure tiers to the consumer.
High Speed One	High speed rail line from St. Pancras International Station in London to the Channel Tunnel. Formerly known as the Channel Tunnel Rail Link.
High Speed Two	Proposed high speed rail line between London and the West Midlands (Phase One) and on to Manchester and Leeds (Phase Two). Phase 2a consists of the section between the West Midlands and Crewe.
High Speed Two Limited	The company set up by the Government to develop proposals for a new high speed railway line between London and the West Midlands and to consider the case for new high speed rail services linking London, northern England and Scotland.
Highways England	The Government company that operates, maintains and improves England's motorways and major A roads.
Historic England	The public body that looks after England's historic environment and helps people understand, value and care for historic places.
Historic Environment Record	A record of all known archaeological finds and features and historic buildings and historic /landscape features, relating to all periods from the earliest human activity to the present day; maintained by each County and Unitary Authority in the United Kingdom.
hoarding	A temporary screen or barrier erected around a construction site.
hybrid Bill	Hybrid Bills mix the characteristics of public and private bills. The provisions in a hybrid Bill would affect the general public, but would also have particular effects on specific individuals or groups.

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Term	Definition
hydraulic bound layer	Soil type materials (granular or cohesive) improved by the addition of various cementitious/asphaltic materials. It can be produced in-situ or elsewhere, and is used in constructing slab track.
hydrogeology	The nature, distribution and movement of groundwater in soils and rocks, including in aquifers.
hydromorphology	The physical characteristics of the shape, boundaries and content of a water body.
hyperspectral survey	A survey that utilises sensors that detect wavelengths of the electromagnetic spectrum that are not visible to the human eye. They are used in archaeological surveys to detect features within the historic landscape (e.g. field systems) that cannot be detected in visible wavelengths.
impact	Used throughout this EIA Report to refer to changes to the environment that have the potential to occur as a result of the construction and/or operation of the Proposed Scheme. (See also: 'effect'.)
in-combination effects	A combination of environmental effects on community or business establishments (for example, from sound, noise and vibration; dust and air quality).
in-combination climate change impacts	The combined effects of the impacts of the Proposed Scheme and potential climate change impacts on the receiving environment.
inert waste	Defined in Article 2(e) of the EU Landfill Directive (1999/31/EC) as waste that does not undergo significant physical, chemical or biological transformations.
infrastructure maintenance depot	A facility providing logistical support for the maintenance and repair of the HS2 railway track and associated infrastructure (excluding trains).
inorganic (contaminant)	Contaminants comprised primarily of metals, metal compounds, certain minerals, acids and alkalis.
Institute of Environmental Management and Assessment	Professional membership organisation for environmental practitioners.
integrity (ecology)	The ecological health of an area.
Intercity Express Programme	An initiative by the Department for Transport (DfT) to produce new trains to replace the InterCity 125 fleet on the East Coast Main Line and Great Western Main Line.
Interdepartmental Analysts Group	A cross-government multi-disciplinary peer review forum for policy appraisals and other analysis.
Intergovernmental Panel on Climate Change	A scientific intergovernmental body, tasked with the production of assessments of our overall understanding of the scientific, environmental, technical and socio-economic risks from and likely responses required to climate change.
interlocking system	A signalling system to ensure the safe running of trains.

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Term	Definition
interoperability	The ability of trains to operate across the European high speed network.
inter-project effects	The cumulative interaction of the Proposed Scheme with other projects (committed developments).
intrusive investigation	An in-depth investigation involving further sampling and analysis, such as the gathering of samples from the ground, walls, ceilings for the detection of contamination, asbestos and or archaeological remains.
in-situ preservation (cultural heritage)	Preserving archaeological remains in their original position.
inverted siphon	A form of culvert used on level ground where the water level has to be lowered to pass under the Proposed Scheme, other railways or a road access.
isolation (community and socio-economic)	Physical and psychological barriers faced by users in accessing socio-economic and community resources, which may affect their tendency to use them.
kiss-and-ride (traffic and transport)	Drop-off point for car users at stations, airports and interchanges.
$L_{pA10,T}$	The A-weighted sound pressure level that is exceeded for 10% of a given time interval, T, measured using the fast time-weighting. It is generally used to describe road traffic noise.
$L_{pA90,T}$	A parameter that is widely used to quantify background noise and generally reflects the soundscape in the lulls between individual events. It is the A-weighted sound pressure level that is exceeded for 90% of a given time interval, T, measured using the fast time-weighting (F) and quoted to the nearest whole number of decibels. Over a one-hour period, the L_{pA90} will be the sound level exceeded for 54 minutes.
$L_{pAeq,T}$	See 'equivalent continuous sound pressure level'.
L_{pAmax}	The maximum A-weighted sound pressure level attained during a given time interval, T. It is normally measured using slow or fast time-weighting. It is generally used when assessing the likelihood of night-time sleep disturbance.
land drainage area	A type of shallow balancing pond used for land drainage purposes. The area may be dry for much of the year and will often be suitable for livestock grazing once returned to landowners.
landscape character area	Areas of landscape that have a broadly consistent pattern of topography, land use and vegetation cover.
lead contractor	A construction company that is directly contracted for the works by the nominated undertaker.
laydown area	An area used for the temporary storage of construction equipment and supplies.
leakage (economic)	The amount of economic benefit that leaks out of the area of impact through processes such as commuters or the supply chain spending outside the local area.

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Term	Definition
LiDAR	Light detection and ranging (LiDAR) is a high resolution remote sensing technology which uses a laser to measure distance between a satellite, aerial, terrestrial or mobile source and the ground, buildings and vegetation to create a three-dimensional model.
light goods vehicle	A motor vehicle used to carry goods with a total mass of up to 3.5 tonnes.
listed building	A building of special architectural or historic interest. Listed buildings are graded I, II* or II, with Grade I being the highest. Listing includes the interior, exterior and the setting of the building.
load balancers	Electrical equipment used to balance the electrical loads so that the unbalance is kept within acceptable limits set by the supply authority.
local access forum	Set up under the Countryside and Rights of Way Act 2000 to advise local highway or national park authorities on the improvement of public access for the purpose of outdoor recreation and enjoyment of the area.
local planning authority	The local authority or council that is empowered by law to exercise planning functions.
local development framework	Spatial planning strategy introduced in England and Wales by the Planning and Compulsory Purchase Act 2004. The local development framework contains a number of development plan documents prepared by the local planning authority that set the policies and development allocations for an area.
local wildlife site	A non-statutory site of nature conservation value that has been designated 'locally'. These sites are referred to differently between counties. Common terms including site of importance for nature conservation, county wildlife site, site of biological importance, site of local importance and sites of metropolitan importance.
lower super output area	An area built up from output areas typically consisting of 400-1,200 households.
made ground	Land where natural and undisturbed soils have largely been replaced by man-made or artificial materials. It may be composed of a variety of materials including imported natural soils and rocks with or without residues of industrial processes (such as ash) or demolition material (such as crushed brick or concrete).
main ES	The original HS2 Phase One Environmental Statement that was deposited along with the High Speed Rail (London - West Midlands) Bill in November 2013.
maintenance loop	Additional track that will run for a short distance alongside the main HS2 rail line. The loops will be used for the storage of maintenance trains during operation. They will also provide a safe stopping location for any HS2 train that develops a fault.
main construction compound	A strategic construction hub for core project management (engineering, planning and construction delivery), commercial and administrative staff associated with the construction of the Proposed Scheme. These compounds will include an area for equipment and materials storage, as well as providing main welfare facilities

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Term	Definition
	for construction staff, with some compounds also providing overnight sleeping accommodation for construction staff.
main river	A river maintained directly by the Environment Agency. They are generally larger arterial watercourses.
maximum sound level	The maximum level of sound identified during a given time interval, T.
metapopulation	A group of spatially separated populations of the same species which interact at some level.
micron	An alternative term for micrometre (µm).
mined tunnel	Tunnelling method where self-supporting subsurface material (e.g. rock/hard clay) is present. It involves the use of drill and blast techniques or excavation/sprayed concrete lining to advance the excavation.
mineral planning authority	A unitary authority that deals with all mineral planning issues within their area. In parts of England with two tiers of local government (counties and districts), mineral planning authorities are the county councils. National Parks are also mineral planning authorities.
mineral safeguarding area	An area with known mineral resources that are of identified economic or conservation value. These areas are defined by mineral planning authorities.
mitigation	The measures put forward to prevent, reduce and where possible, offset any adverse effects on the environment.
modal (mode) shift	A shift from one transport type to another, e.g. from road travel to rail travel.
moisture deficit (potatoes)	The calculated deficit between the water supplied by average summer rainfall at that location and the quantity of water required to grow a crop of potatoes, assumed to root to 70cm depth, at that location (without suffering from a lack of water). The larger the moisture deficit, the greater the likelihood of yields being reduced by droughtiness. In practice the deficit has to be met from soil water reserves, irrigation and/or by the crop wilting; the last reduces yields.
moisture deficit (wheat)	As above but for a wheat crop assumed to root to a depth of 120cm.
monopile	A single large diameter pile with significant vertical and lateral load carrying capacity. It is used as an alternative to a pile group.
multiplier (economic)	An effect in economics in which an increase in direct spending produces an increase in national income and consumption that is greater than the initial amount spent. For example, building a factory will lead to the employment of construction and factory workers. This new employment will stimulate growth and employment in local services in the surrounding areas (e.g. cafes, restaurants and shops), as new demand will be generated.

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Term	Definition
National Adaptation Programme	A programme established by the Government, industry and non-government organisations to help the UK adapt successfully to future weather conditions, by dealing with the risks and making the most of the opportunities.
National Compensation Code	The collective term for the principles derived from both statute and case law, relating to compensation for compulsory acquisition. It ensures that when land is needed to build an infrastructure project, the owners receive compensation to help them to move house or to relocate a business. The code also ensures that those who experience real, physical events from a scheme once it is in operation, for example vibration or noise, are entitled to compensation.
National Grid	A private company that owns and manages the national grid (electricity) and the national transmission system (gas) within the UK.
national grid	The high-voltage electricity transmission network in the UK.
National Farmers Union	Member organisation/industry association for Welsh and English farmers
National Forest Inventory	A record of the size and distribution of forests and woodlands in Great Britain and information on key forest attributes run by the Forestry Commission.
National Trust	A UK conservation charity protecting historic places and gardens and areas of countryside.
National Vegetation Classification	A comprehensive classification and description of the plant communities of Britain, administered by the Joint Nature Conservation Committee.
National vocational qualification	A qualification in a vocational subject set at various levels. For example, levels two and three correspond to GCSE and A-level respectively.
natural area	Sub-divisions of England, defined by Natural England, each with a characteristic association of wildlife and natural features. They provide a way of interpreting the ecological variations of the country in terms of natural features, illustrating the distinctions between one area and another.
Natural England	Executive non-departmental public body constituted under the Natural Environment and Rural Communities Act 2006 (section 2(1)) to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.
net (nett)	After all deductions have been made.
Network Rail	The not-for-dividend owner and operator of Britain's railway infrastructure. Network Rail runs, maintains and develops Britain's rail tracks, signalling, bridges, tunnels, level crossings and many key stations.
niche (ecology)	The role that a species plays in an ecosystem. Dimensions of a species' niche include their food and time of feeding and the chemical and physical make-up of their environments (e.g. water salinity, temperature).

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nitrate vulnerable zone	Areas designated under the EU Nitrates Directive (91/676/EEC) with the aim of reducing the level of nitrates in surface and groundwater. Farmers with land in nitrate vulnerable zones have to follow mandatory rules to manage nitrate loss from agriculture.
nitrogen dioxide	A gas produced when fuels are burned and is often present in motor vehicle and boiler exhaust fumes. It is an irritant to the respiratory system.
nitrogen oxides	A group of chemical compounds consisting only of nitrogen and oxygen which may be interconverted in the atmosphere. The principal oxides of nitrogen are nitric oxide and nitrogen dioxide.
noise barrier	A solid construction that reduces unwanted sound. It may take many forms including: engineering cutting; retaining wall; noise fence barrier; landscape earthworks; a 'low level' barrier on a viaduct; a parapet barrier on a viaduct; or any combination of these measures.
Nominated Undertaker	The body or bodies appointed to implement the powers of the hybrid Bill to construct and maintain the Proposed Scheme.
non-government organisation	A legally constituted organisation that is independent of government. It is ordinarily non-profit and may be organised at a local, national or international level.
non-hazardous waste	Any waste not defined as 'hazardous' under Directive 91/689/EEC. Examples include soils from ground/site clearance and demolition wastes.
non-plastic soil	A soil with coarse textures, i.e. sands and loamy sands, which do not exhibit plasticity (i.e. the ability of a soil to be deformed beyond the point where it cannot recover its original shape) at any moisture content.
non-technical summary	A report that briefly describes the main points discussed in an environmental statement or environmental impact assessment report without using technical language.
Ordnance Datum	The height above mean sea-level, taken from a reference point at Newlyn, Cornwall. This is the national height system for Britain.
offline	Not connected or currently in use. Also used in engineering in relation to railways, roads, pipelines etc. to denote a route (or a structure on a route, such as a bridge) away from the original alignment.
off-route effects	Effects of the Proposed Scheme that may occur at locations beyond the HS2 Phase 2a route corridor.
online	Connected or currently in use. Also used in engineering in relation to railway, roads, pipelines etc. to denote a route (or a structure on a route, such as a bridge) on the original alignment.
on-network	Refers to the existing rail network. For example, where modifications are required to the West Coast Main Line, these are referred to as 'on-network' modifications.

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Term	Definition
ordinary watercourse	Any watercourse not classified as a main river.
Ordnance Survey	The national mapping agency for Britain.
organic (contaminant)	Contaminants composed primarily of oils, tars or solvents.
Organic Entry Level Stewardship	A specialist element of the environmental stewardship scheme that is open to all organic farmers with land registered as organic or in organic conversion, and with similar management options to entry level stewardship.
output areas	Geographically defined areas based on postcode units which have been used since the 2001 Census for statistical purposes in relation to socio-economic information.
overbridge	A bridge crossing over a transport corridor such as a railway line.
overhead line equipment	Electric wires suspended over the track, supplying traction power to trains.
oversail	During works to overhead power lines, cranes will often be used. If part of the crane extends into the airspace above a surrounding property (e.g. the garden of a nearby dwelling), this is referred to as oversailing. Where overhead power lines overlap property or land, this is also referred to as oversailing. During normal operations in high winds, overhead power lines can sometimes be blown, such that they swing out from their normal alignment. When this covers a property, this is referred to as oversailing.
pad foundations	A foundation structure that spreads the imposed loads over a sufficient area to reduce stress on foundation material. Often described as shallow foundations.
package substation	A small remote substation providing electrical power to track-side equipment.
palaeoenvironmental	An environment at a period in the geological past.
pantograph	A device that is attached to the roof of an electric train to collect power through contact with the overhead catenary wire.
parapets	A low wall along the edge of a structure (e.g. a bridge), to protect people from falling.
park pale	An historic palisade used to enclose deer within a defined area.
particulate matter	Discrete particles in ambient air, with diameters ranging between nanometres (billionths of a metre) to micrometres (millionths of a metre).
pathways (pollution)	The routes by which pollutants are transmitted through air, water, soils, plants and organisms to their receptors.
peak particle velocity	The maximum velocity that is recorded during a particular vibration event. It is commonly used to assess the potential for damage to structures due to ground-borne vibration.

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Term	Definition
Pendolino trains	Trains that tilt to enable them to travel around curves faster than trains without this technology.
permissive path	A path that is not a public right of way, but which the landowner permits the public to use. The landowner can close the path for periods of time.
person trip	A one-way journey by one person by any mode of transport, including walking, cycling, privately operated motor vehicle or any public transport mode.
phase 1 habitat survey	A habitat classification and field survey technique to record semi-natural vegetation and other wildlife habitats.
Phase One	Phase One of the proposed HS2 network, a high speed railway between London and the West Midlands with a connection via the West Coast Main Line at conventional speeds to the North West and Scotland. Phase One includes stations at London Euston, Old Oak Common (West London), Birmingham Interchange (near the National Exhibition Centre and Birmingham Airport) and Curzon Street (Birmingham city centre).
Phase Two	Phase Two of the proposed HS2 network extends the high speed railway beyond the West Midlands to Manchester and Leeds with connections to conventional railway lines via the West Coast and East Coast Main Lines.
Phase 2a	The section of the Phase Two route between the West Midlands and Crewe. It will include a connection with Phase One at Fradley, to the north-east of Lichfield, and a connection with the West Coast Main Line (WCML) south of Crewe.
Phase 2b	The section of the Phase Two route from Crewe to Manchester and from the West Midlands to Leeds, completing what is known as the 'Y network'.
photomontage	The process and result of inserting an image of the Proposed Scheme onto a photograph to show how existing views could be changed by the Proposed Scheme.
piezometric level	The level to which the water level will rise in wells penetrating an aquifer.
pile cap	A concrete structure used to link a number of discrete pile elements into a single arrangement to support significant loads that the pile elements are not capable of supporting individually.
piled foundation	Deeper foundations such as piles, and diaphragm walls, where loads are distributed through the ground at depth by drilled or driven structures. Often described as embedded or deep foundations.
piled retaining wall	Constructed using long piles to allow a steeper overall slope gradient than would be naturally possible.
piling	Driving and embedding piles of wood, concrete or steel deep into the ground, to support buildings/structures at the foundation level.

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Term	Definition
plastic soil	Soil with a relatively high proportion of silt and clay that, within a certain moisture content range, is capable of being moulded or deformed without rupture.
PM _{2.5}	Any particulate matter with an aerodynamic diameter equal to or less than 2.5 micrometres.
PM ₁₀	Any particulate matter with an aerodynamic diameter equal to or less than 10 micrometres.
polarity	Term used to describe the measurement of the magnetic response identified during a geophysical survey. An anomaly can have a positive or negative polarity.
ponding	The collection of standing water at the ground surface due to the presence of an impermeable layer within the soil.
porous (tunnel) portal	Perforated structures at tunnel portals (entrances), usually formed of concrete, designed to allow the passage of air from the tunnel. These reduce both air pressure changes and the noise generated when a high speed train enters or leaves a tunnel.
portal ramp	A ramp that takes the rail track from ground-level down to the tunnel level.
possession	When a section of rail line is required for maintenance, repair or renewal and when trains cannot run, it is handed over by the operators to the engineering contractors, who take possession for a specified period. Where this possession occurs for longer than the standard possession, it is referred to as an abnormal possession.
pre-cast pile	A driven pile produced from pre-cast concrete.
principal aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water storage and transmission. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifers.
Promoter	The person promoting the hybrid Bill for Phase 2a of HS2, i.e. the Secretary of State for Transport.
Proposed Scheme	Proposed high speed rail line between the West Midlands and Crewe (i.e. Phase 2a of HS2).
Protected Characteristics Groups	Groups identified in the Equality Act 2010 as sharing a particular characteristic against which it is illegal to discriminate.
Public Health England	An executive agency, sponsored by the Department of Health. Its purpose is to protect and improve the nation's health and wellbeing, and reduce health inequalities.
Public Health Observatories	Public Health Observatories produce information, data and intelligence on people's health and health care for practitioners, commissioners, policy makers

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Term	Definition
	and the wider community. The Network of Public Health Observatories is part of Public Health England.
public realm	Outdoor areas, other than highways, accessible to the public in towns and cities.
public right(s) of way	A highway where the public has the right to walk; and, depending on its class, use for other modes of travel. It can be a footpath (used for walking only), a bridleway (used for walking, riding a horse and cycling), a restricted byway (as a bridleway, but use by non-motorised vehicles also permitted) or a byway that is open to all traffic (include motor vehicles).
pylon	A tall lattice-like structure (usually made of steel) which is used to support overhead power lines. Also known as an electricity transmission tower.
Q95 flow	A measure of low flow, defined as the flow in a water course equalled or exceeded 95% of the time.
Quaternary	The most recent period of geological time, approximately equated to the period of the last ice age to the present day.
Quiet Area	An external space identified as such by local authorities under the Environmental Noise Regulations 2006.
quiet area	An area defined in the Scope and Methodology Report for HS2 Phase 2a as either a Quiet Area (identified as such under the Environmental Noise Regulations 2006) or a resource prized for providing tranquillity.
railhead	A site at strategic locations along the route with connections to the National Rail network. They will be used as the delivery location for bulk rail-borne materials, such as ballast, rails and sleepers.
railway corridor	The area in which the railway tracks are located. In the case of HS2, this corridor will typically be 19m wide (excluding fences) and include two tracks, overhead line equipment, track drainage, electricity cables, lineside paths and ducting for fibre optic communications.
raking piles	Piles installed at an angle to the vertical. They are usually installed alongside regular vertical piles where additional support is required when ground conditions are likely to result in lateral (sideways) movement.
raking props	Props (posts to give support under a load) installed at an angle to laterally support the side walls of an open excavation or an internal or external wall when other support structures have been removed.
Ramsar site	Wetland sites that are of international importance, as designated under Article 2(1) of the Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar (Iran), 2 February 1971. UN Treaty Series No. 14583.
realignment	Used throughout this EIA Report to refer to a slight change to the route or direction of a road due to the location of the route of the Proposed Scheme. (See also: 'diversion'.)

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Term	Definition
receptor	A component of the natural or built environment (such as a human being, water, air, a building or a species) affected by an impact of the construction and/or operation of a proposed development.
reconductoring	The process of installing or replacing conductors (i.e. wires) on a stretch of overhead power line. This will be done through the use of winches.
refurbishment (overhead line)	Replacement of some or all of the components/materials (e.g. steelwork for pylons, wires, fittings) that make up overhead lines. The refurbishment can be full (i.e. replacing all of the components that make up the overhead line), or partial (e.g. replacing some fittings only).
reinstatement (overhead line)	Returning overhead lines to their former position and alignment following a temporary diversion.
remediation	The process of removing a pollution linkage (i.e. by removing one or more of the elements in a source-pathway-receptor linkage) in contaminated land in order to render an acceptable risk. Usually this involves a degree of removal of contaminants and/ or blockage of pathways.
replacement flood storage area	An area of low-lying land designed to temporarily fill with flood water to replace an area of existing floodplain lost due to development.
residual impacts	Those impacts of the development that cannot be mitigated following implementation of mitigation proposals.
retained cutting	A cutting constructed with additional structural support that allows a steeper overall slope gradient than would otherwise be possible. This may be a partially retained cutting, which would include an element of naturally supported slope (usually above the retained element) or a fully retained cutting, which usually has vertical sides.
retained embankment	An embankment constructed with additional structural support (usually in the form of a retaining wall) that allows a steeper overall slope gradient than would otherwise be possible. This may be a partially retained embankment, which would include an element of naturally supported slope (usually above the retained element) or a fully retained embankment, which usually has vertical sides.
Register of Historic Battlefields	Historic England's non-statutory register which identifies important English battlefields. Its purpose is to offer them protection and to encourage a greater understanding of their significance.
Register of Historic Parks and Gardens	Historic England's non-statutory register which identifies over 1,600 sites of historic interest in England assessed to be of national importance. Its purpose is to offer them protection and to encourage a greater understanding of their significance.
restoration (ecology)	The re-establishment of a damaged or degraded system or habitat to a level similar to its original condition.
ripping	Loosening soil or rock by drawing a forked/pronged implement through it.

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Term	Definition
riparian area	The interface between land and a river or stream.
risk assessment	An assessment of the probability of a hazard occurring that could result in an impact.
river basin management plan	Plans developed under the EU Water Framework Directive setting out environmental objectives for all groundwater and surface water bodies and protected areas within a river basin district.
river corridor survey	The mapping of vegetation and physical features along the watercourse corridor using standard symbols, with cross-sections of river channel form, including land to either side of the river channel.
river habitat survey	A survey method designed to characterise and assess the physical structure of watercourses involving the recognition of vegetation types and an understanding of basic geomorphological principles.
road rail vehicle	A vehicle that can operate both on rail tracks and roads. Such vehicles are often used for railway maintenance.
rolling stock	Passenger or freight vehicles that operate on a railway.
rolling stock maintenance depot	A workshop within which trains are maintained.
'rolling' work site	A work site that moves over time across a geographic area as works are completed in one location to then enable works in an adjacent location.
route-wide effects	Effects of the Proposed Scheme that may occur at a geographical scale greater than the community area level.
Royal Assent	The final step required for any parliamentary Bill to become law.
ruderal vegetation	Vegetation that is able to grow despite poor soil quality or limited soil cover. It is often the first to colonise previously disturbed land.
run-off	The flow of water over the surface of the ground.
Rural Payments Agency	The Defra agency that administers payments to farmers and traders.
sand	Soil particles from 0.06mm-2.0mm in equivalent diameter. Fine sand particles are from 0.06mm-0.2mm; medium sand from 0.2mm-0.6mm; and coarse sand from 0.6mm-2.0mm.
satellite construction compound	A compound that is smaller in size than the main construction compounds. Satellite construction compounds provide office accommodation for limited numbers of staff involved in the construction of the Proposed Scheme. Welfare facilities for staff are also provided.

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Term	Definition
saved policies	Policies within unitary development plans, local plans and structure plans that are saved for a period of time whilst replacement local development documents are produced.
scheduled monument	Nationally significant heritage assets protected by the Ancient Monuments and Archaeological Areas Act 1979.
scoping	An initial stage in the environmental impact assessment process to determine the nature and potential scale of environmental effects arising as a result of a proposed development, and an assessment of what further studies are required to establish their potential environmental impacts and effects.
screening	The first stage in an environmental impact assessment. It is used to determine if further assessment is necessary.
section 61 consent	Prior consent issued under section 61 of the Control of Pollution Act 1974. The application for consent details how noise is to be managed on-site.
secant pile wall	Method of construction using interlocking piles. After a first set of primary piles are inserted, secondary piles are set using concrete to fill the space between the primary piles.
secondary aquifer	There are two types of secondary aquifer designation. 'Secondary A' are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. 'Secondary B' are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
setting (cultural heritage)	The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive, negative or neutral contribution to the significance of an asset and may affect the ability to appreciate it.
severance	A change in ease of access for non-motorised users due to, for example, a change in travel distance or travel time or a change in traffic levels on a route that makes it harder for non-motorised users to cross it. A reference to severance in this environmental impact assessment report does not necessarily imply that a route is closed to access.
shear wall	A structural wall made up of braced panels to counter the effects of lateral (sideways) load acting on a structure.
siding	A section of track forming a branch off the main railway line. A siding can be used to store a train, or to allow trains to reverse and enter the main railway line running in the opposite direction from which they entered the siding.
silt	Soil particles from 0.002mm to less than 0.06mm in equivalent diameter.

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Term	Definition
site of biological importance	A non-statutory designation used by some local planning authorities to protect locally valued sites of biological diversity described as local wildlife sites by the UK Government.
site of importance for nature conservation	A site that supports both locally and nationally threatened wildlife. Many of these sites contain habitats and species that are priorities under the county or UK biodiversity action plans.
site of special scientific interest	Area of land notified by Natural England under Section 28 of the Wildlife and Countryside Act 1981 as being of special interest due to its flora, fauna or geological or physiological features.
site waste management plan	The Site Waste Management Plans Regulations 2008 require any person intending to carry out a construction project with an estimated cost greater than £300,000 to prepare a site waste management plan. A site waste management plan should identify the types and quantities of waste that will be generated and discuss the potential to reduce, re-use and recycle all materials wherever possible.
slewing	Moving a rail track sideways so it is better aligned.
slowly permeable layer	A layer at least 15cm in thickness with the upper boundary within 80cm of the ground surface and with soils that impede the downward movement of excess rainfall.
SMART targets	Targets or objectives set against a five-point criteria: specific, measurable, attainable, realistic and time-bound.
social capital	The connections between the individuals within communities, and the inclination that arises through these networks for individuals to feel valued, to feel a sense of belonging, to have companionship and to tangibly support each other.
soil	The upper layer of the earth's crust, in which plants grow. It consists of weathered rock, organic matter, air spaces and water. Descriptions usually identify the relevant characteristics of its (usually) horizontal layers in terms of their significance for soil characteristics and crop growth, usually to a depth of 1.2m.
soil association	A group of related soil types or soil series developed from a similar geological parent material.
soil compaction	The removal of pore spaces within soil structures and drainage channels between soil structures. This inhibits root penetration and the movement of air and water in soil.
soil erosion	The detachment and movement of soil by the action of water and/or wind.
soil moisture deficit	The difference between the maximum amount of water potentially stored in drained soil and the amount remaining after some of the water has been transpired by growing vegetation.
soil profile	A vertical cross-section through a soil.

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Term	Definition
soil resource	The textures, structures and volume of different qualities of topsoil and subsoil that have a potential for beneficial reuse.
soil sealing	Covering the soil surface with an impermeable material.
soil structure	The combination or aggregation of soil particles into larger compound units (known as peds) with pore spaces and channels between that allow the flow of air and water and the penetration of roots. The secondary units are characterised and classified on the basis of size, shape and degree of development.
soil texture	The relative proportion of the various size fractions of particles in a soil (sand, silt and clay).
solifluction	The slow downhill movement of near-surface soils caused by the alternate freezing and thawing of water contained within them.
sound exposure level	The sound level which, if maintained at a constant level for a period of one second, would have the same amount of energy as a given event (of any duration) at the same receptor.
sound power level (L _w)	A measurement of the total acoustic power radiated by a sound source. The sound power level is an intrinsic characteristic of a source (analogous to its volume or mass), which is not affected by the environment within which the source is located.
sound pressure level	The parameter by which sound levels are measured in air. It is measured in decibels. The threshold of hearing has been set at 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dB at a distance of 1 metre and a change of 3dB in a time-varying sound signal is commonly regarded as being just detectable. A change of 10dB is subjectively twice, or half, as loud.
span	The horizontal distance between two supports of a structure (e.g. piers of a bridge or viaduct).
spur	A short section of railway track connecting to the main line.
stabling	The parking of trains whilst out of operational service.
statutory consultee	Organisations and bodies that must be consulted on relevant planning matters, as defined by statute.
statutory undertaker	<p>A term used to refer to public and private bodies such as railway, electricity, gas, water, sewerage or telecommunications companies that have been given statutory powers to undertake certain works or functions under permitted development rights.</p> <p>Defined in section 98(6) of the Environmental Protection Act 1990 as:</p> <ul style="list-style-type: none"> - any person authorised by any enactment to carry on any railway, light railway, tramway or road transport undertaking; - any person authorised by any enactment to carry on any canal, inland navigation, dock, harbour or pier undertaking; or

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Term	Definition
	- any relevant airport operator (within the meaning of Part V of the Airports Act 1986).
steel screw pile	A displacement pile screwed into the ground in order to transfer vertical load into the ground.
stressing tendon	A high yield steel bar used to apply a compressive force to concrete such that under service conditions there is no net tension within the element.
stockpile	An area where materials excavated during construction of the scheme will be stored temporarily before being reused, or where construction plant and machinery associated with the scheme is stored.
stopped-up	The permanent closure of a public right of way.
Strategic Road Network	The network of motorways and major trunk roads in England.
structure plan	The planning policy document prepared by a county council that sets out the strategic policy framework for the county.
Subgrade 3a (Agricultural Land Classification)	'Good quality' agricultural land that is capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
Subgrade 3b (Agricultural Land Classification)	'Moderate quality' agricultural land that is capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
subsoil	Weathered soil layer extending between the natural topsoil and the unweathered basal layer (geological parent material) below, or similar material on which topsoil can be spread. Subsoil has lower organic matter and plant nutrient content than topsoil. In most cases topsoils require a subsoil to perform one or a number of natural soil functions.
subsoiler	A tractor-mounted implement used to loosen and break up soil at depths below the level of a traditional plough, disk harrow or rototiller.
substructure	The foundations or supporting part of a structure below ground level.
superficial deposit	A geological deposit that was laid down during the Quaternary period. Such deposits were largely formed by river and glacial processes but can also include wind-blown deposits known as loess.
superstructure	The part of a structure above ground.
sustainable transport	Any type of transport that has lower impacts on the environment and is more fuel efficient than traditional travel by single occupancy private motor vehicle. This includes walking, cycling, public transport and car sharing.

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Term	Definition
surface water	Waters including rivers, lakes, loughs, reservoirs, canals, streams, ditches, coastal waters and estuaries.
surplus excavated material	Excavated material becomes surplus if: its irrecoverable physical, chemical or biochemical quality prevents it from being used in the Proposed Scheme; there is more material than required for the Proposed Scheme; or the requirement for a type of material is too far away from the excavation point to make its use practicable.
sustainable drainage systems	Measures designed to control surface run-off close to its source, including management practices and control measures such as storage tanks, basins, swales, ponds and lakes. Sustainable drainage systems allow a gradual release of water and thereby reduce the potential for downstream flooding.
switchgear	Electrical equipment used to control and isolate the flow of electricity to a circuit.
sustainable placement	The on-site placement for disposal of surplus excavated material to avoid causing environmental effects (e.g. from transport) that would otherwise be associated with the off-site disposal of that material. 'On-site' in this context means within the land required for the purposes of the Proposed Scheme and 'off-site' means external land (or landfill site) that is not specifically required for the Proposed Scheme.
sustainable placement area	An area used for sustainable placement.
tension piles	A tension pile is installed to resist being pulled out of the ground instead of supporting a load.
threshold	A level of effect above which an assessment will be taken of whether any changes to procedures need to be made.
till	An unsorted glacial sediment deposited directly by a glacier.
topography	The natural or artificial features, level and surface form of the ground surface.
topsoil	Upper layer of a soil profile, usually darker in colour (because of its higher content of organic matter) and more fertile than subsoil, and which is a product of natural biological and environmental processes.
trackout	The movement of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.
traction power	Power provided primarily for the purpose of moving trains.
traffickability	The capability of a soil to bear traffic (vehicles, livestock or people) without causing any physical damage to it or impairing its functions.
transfer node	A location where bulk deliveries or excavated materials leave or enter the construction worksites from public roads.

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Term	Definition
tranquillity	A state of calm or quiet.
translocation	The transporting and release of species or habitats from one location to another. For example, if an area of land is required permanently for a new development, species can be moved from that site to a suitable alternative location.
transmission tower	See 'electricity pylon'.
tree preservation order	An order made by a local planning authority, under the Town and Country Planning Act 1990, in respect of trees or woodlands. The principal effect of a tree preservation order is to prohibit the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction of trees without the local planning authority's consent.
truss	A framework of beams, posts and struts that support a structure (e.g. a roof), or span an opening.
tunnel drive	The process of tunnel excavation and lining.
tunnel drive launch shaft	Vertical excavation to form the starting point to launch a tunnel boring machine.
tunnel boring machine	A tunnelling machine, which consists of a rotary cutting head that occupies the full face of the tunnel. A system of conveyors or pumps is used to remove the excavated material.
tunnel portal	Tunnel entrances and exits.
turnback	A facility that allows a train to reverse. A turnback can be a crossover on the main railway line, or a reversing siding, which branches off the main railway line.
turning head	An area of road or access to allow vehicles to turn back where temporary and permanent road closures as part of the construction and operation of the scheme has created dead ends.
two-way trips	A person trip is a one-way journey by one person by any mode of transport, including walking, cycling, privately operated motor vehicles, or any public transport modes. A vehicle trip is a one-way journey by a single privately operated motor vehicle regardless of the number of persons in the vehicle. Two-way trips refer to the total number of vehicle movements in both directions (i.e. with 200 westbound vehicles and 100 eastbound, there would be 300 two-way trips)
United Kingdom Climate Impacts Programme	Established in 1997 by the United Kingdom Government to coordinate and influence research into adapting to climate change, and to disseminate knowledge and tools for users to consider their climate risks and plan to adapt.
United Kingdom Climate Projections 2009	The United Kingdom Climate Projections provide future projections of climate change for different time periods and different possible scenarios of greenhouse gas emissions. These illustrate a range of possible future changes to the United Kingdom's climate.
underbridge	A bridge crossing under a transport corridor such as a railway line.

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Term	Definition
unitary development plan	A statutory document that sets out a council's planning policies for development, conservation, regeneration and environmental improvement activity.
unemployment rate	The proportion of residents unemployed and actively seeking employment as a percentage of the economically active population.
unexploded ordnance	Explosives that did not explode when deployed and thus still pose a risk of detonation.
unproductive strata	Layers of rock or superficial deposits with low permeability or porosity that have a negligible significance for water supply.
upgrade (overhead line)	Increasing the power flow along an overhead power line.
up line	The line of the route heading towards Euston station, London.
utility	A commodity or service, such as electricity, gas or fuel that is provided by a public or private service provider. These are often delivered to customers via pipes, cables etc. under the ground. They can also be delivered above the ground, for example, via overhead power lines.
utility diversion	Utilities may be diverted, or have their height or depth altered, where their current alignment, either above or below ground, would prevent the construction of certain components of the Proposed Scheme.
vehicle movement	A journey made by a vehicle that can either be a one-way or two-way trip.
ventilation (and intervention) shafts	Shafts located at intervals along the length of a tunnel and used for ventilation and emergency access/exit.
viaduct	A type of bridge composed of a series of spans, used to carry roads and railways across valleys or other infrastructure.
vibration dose value	Defined in BS6472-1(2008) as a relationship that yields a consistent assessment of vibration which correlates well with subjective response. It is used to estimate the probability of adverse comment expected from people experiencing vibration in buildings. Consideration is given to the time of day and use made of occupied space in buildings (e.g. residential, office or workshop).
viewpoint	A place from which something can be viewed.
visual receptor	People who may have a view of the Proposed Scheme during construction or operation.
vulnerable road users	Defined in this environmental impact assessment report as all pedestrians, cyclists and equestrians.
Water Framework Directive surveys	A survey of surface water and groundwater bodies to establish their current condition or 'status or potential' as per the Water Framework Directive (as defined by EU Directive 2000/60/EC, and amended by subsequent regulations).

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Term	Definition
Web Transport Analysis Guidance	Department for Transport guidance on the role of transport modelling and appraisal.
wellbeing	A general term for the condition of an individual or group, for example their social, economic, psychological, spiritual or medical state. High wellbeing means that, in some sense, the individual or group's experience is positive, while low wellbeing is associated with negative conditions.
West Coast Main Line	Inter-urban rail line connecting London, Birmingham, Manchester, Liverpool and Glasgow.
wetness class	Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six wetness classes are identified, ranging from 'very well drained' to 'very poorly drained'.
wetness limitation	A soil wetness limitation exists where the soil water regime adversely affects plant growth or imposes restrictions on cultivations or grazing by livestock.
winches	Mechanical devices that pull in or let out wires (conductors). They also adjust the tension of wires on the overhead power line.
wing wall	A smaller wall attached or next to a larger wall or structure.
World Heritage Site	A natural or man-made site, area, or structure recognized as being of outstanding international importance and therefore as deserving special protection. Sites are nominated to and designated by the World Heritage Convention (an organization of UNESCO).
Y network	Completed HS2 network (both Phase One and Two), comprising a high speed rail line between London and the West Midlands, then splitting into two lines, one continuing to Manchester and the other to Leeds via the East Midlands.
zone of theoretical visibility	The likely (or theoretical) extent of visibility of a development, usually shown on a map.

2 List of abbreviations

2.1 Symbols and units of measurement

Abbreviation	Meaning
<	is less than
≤	is less than or equal to
>	is more than
≥	is more than or equal to
©	copyright
%	per cent
£	pound sterling
ASPT	average score per taxon
A/m	amperes per metre
Bqm ³	becquerels per cubic metre
CaCO ₃	calcium carbonate
CH ₄	methane
cm	centimetre
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
dB	decibel
dB(A)	decibel A-weighted
µg/m ³	micrograms per cubic metre
gCO ₂ e	grams of carbon dioxide equivalent
GHz	gigahertz

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Abbreviation	Meaning
g/yr	grams per year
hr	hour
ha	hectare
hectad	an area of 10km ²
Hz	hertz
kg	kilogram
km	kilometre
km ²	square kilometre
kph	kilometres per hour
kV	kilovolt
kV/h	kilovolts per hour
kWh	kilowatt hour
µm	micrometre
m	metre
m ²	square metre
m ³	cubic metre
m ³ /d	cubic metres per day
m ³ /s	cubic metres per second (also known as cumecs)
m/s	metres per second
mm/s	millimetres per second
N	nitrogen
NO	nitrogen oxide
NO ₂	nitrogen dioxide

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Abbreviation	Meaning
NO _x	nitrogen oxides
min	minute
mm	millimetre
mph	miles per hour
MtCO ₂ e	mega tonne of carbon dioxide equivalent
MW	megawatt
pa	per annum
p/hr	per hour
pkm	passenger kilometre
PPMS	passengers per metre square
PPV	peak particle velocity
μT	microtesla
RFC	ratio of flow to capacity
T	tonne
tCO ₂ e	metric tonne of carbon dioxide equivalent
tph	trains per hour
V	volt
v/c	volume of capacity ratio
vpd	vehicles per day
vph	vehicles per hour

2.2 Acronyms and initialisms

Abbreviation	Meaning
AADT	annual average daily traffic
AAR	annual average rainfall
AAWT	annual average weekday traffic
ACA	Archaeological Character Area
ACM	asbestos containing material(s)
AD	Anno Domini
ADMS	Atmospheric Dispersion Modelling System
AEP	annual exceedance probability
AHVLA	Animal Health and Veterinary Laboratories Agency
ALARP	As Low As Reasonably Practicable
ALC	Agricultural Land Classification
AOD	above Ordnance Datum
AONB	area(s) of outstanding natural beauty
AoS	appraisal of sustainability
AP	Additional Provision
APHO	Association of Public Health Observatories
APW	available profile water
AQAP	air quality action plan(s)
AQMA	air quality management area(s)
ARP	adaptation reporting power
ASC	adaptation sub-committee
ASL	advanced stop line(s)

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Abbreviation	Meaning
AStSWF	area(s) susceptible to surface water flooding
ASZ	archaeological sub-zone(s)
ATC	automatic traffic count(s)
ATO	accumulated temperature above 0°C
AURN	Automatic Urban and Rural Network
AWC	available water capacity
AWI	Ancient Woodland Inventory
AWIS	Ancient Woodland Inventory Site
BAME	Black, Asian and minority ethnic people
BAP	biodiversity action plan(s)
BBSBD	British Bryological Society Bryophyte Database
BC	Before Christ
BCO	British Council for Offices
BCR	benefit-cost ratio
BFI	Base Flow Index
BFIHOST	Base Flow Index derived using the HOST soil classification
BGL	below ground level
BGS	British Geological Survey
BLEF	Business and Local Economy Fund
BLS	British Lichen Society
BMV	best and most versatile (agricultural land)
BMWP	Biological Monitoring Working Party
BNS	biological notification site(s)

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Abbreviation	Meaning
BoCC	birds of conservation concern
BPA	British Pipeline Agency
BPM	best practicable means
BS	British Standard
BSI	British Standards Institute
BT	British Telecommunications plc
BTO	British Trust for Ornithology
c.	circa
C of E	Church of England
C & I	commercial and industrial
CA	community area
CAAV	Central Association of Agricultural Valuers
CBM	coal bed methane
CC	climate change
CCC	Committee on Climate Change
CCI	Community Conservation Index
CCRA	climate change risk assessment(s)
CCTV	closed-circuit television
CDA	critical drainage area(s)
CDEW	construction, demolition and excavation waste
CDM	Construction (Design and Management) 2015 Regulations
CEC	Cheshire East Council
CEF	Community and Environment Fund

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Abbreviation	Meaning
CET	controlled emission toilet(s)
CFA	community forum area(s)
CFMP	catchment flood management plan(s)
CHADS	Conservation, Horticulture and Agriculture for the Disabled Society
CHP	combined heat and power
CI	cast iron
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CLA	Country Land and Business Association
CL:AIRE	Contaminated Land: Applications in Real Environments
CLEA	Contaminated Land Exposure Assessment
CML	Chiltern Main Line
CoCP	code of construction practice
COP21	21 st Conference of the Parties of the United Nations Framework Convention on Climate Change
CoPA	Control of Pollution Act 1974
CPRE	Campaign to Protect Rural England
CPZ	controlled parking zone(s)
CRE	Contract Requirements Environment
CRT	Canal & River Trust
CSM	conceptual site model
CSM-RA	EU Regulation 402/2013 on the Common Safety Method on Risk Evaluation and Assessment (as amended by Regulation EU 2015/1136);

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Abbreviation	Meaning
CSS	Countryside Stewardship Scheme
DAS	deliverable approach statement(s)
DCLG	Department for Communities and Local Government
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DIO	Defence Infrastructure Organisation
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DMV	deserted medieval village
DoS	degree of saturation
DPD	development plan document(s)
DPLBAR	Index describing catchment size and drainage path configuration (km)
DPSBAR	Index of catchment steepness (m/km)
DRN	detailed river network(s)
DSA	delivery and site allocation(s)
DTM	digital terrain model(s)
EA	Environment Agency
EclA	ecological impact assessment
EC	European Commission
ECML	East Coast Main Line
EDI	Equality, diversity and inclusion
eDNA	Environmental DNA
EFA	Education Funding Agency

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Abbreviation	Meaning
EfW	energy from waste
EHP	environmental health practitioner(s)
EHRC	Equality and Human Rights Commission
EHS	Exceptional Hardship Scheme
EIA	environmental impact assessment
ELC	European Landscape Convention
ELS	Entry Level Stewardship
EM	electromagnetic
EMC	electromagnetic compatibility
EMF	electromagnetic field
EMI	electromagnetic interference
EMR	environmental minimum requirements
EMS	environmental management system
EN	European Standard (Euro norm)
EPA	Environmental Protection Act 1990
EPO	Environmental Protection Officer(s)
EPS	European Protected Species
EPUK	Environmental Protection UK
EqIA	equality impact assessment
ES	environmental statement
ETS	emissions trading scheme
EU	European Union
EU ETS	European Union Emissions Trading Scheme

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Abbreviation	Meaning
EWRL	East West Rail Line
FARL	FEH index of flood attenuation due to reservoirs and lake
FC	TUFLOW Flow constriction layer
FCD	field capacity days
FEH	Flood Estimation Handbook
FERA	Food and Environment Research Agency
FMD	Foot and Mouth Disease
FmFSW	Flood Map for Surface Water
FPEXT	Floodplain extent, the fraction of the catchment inundated by a 1 in 100 (1%) annual probability event
FRA	flood risk assessment(s)
FRR	The Flood Risk Regulations 2009
FSMS	Field Survey Methods and Standards
FTA	Federal Transit Administration
FTE	full-time equivalent
FZM	Flood Zone Map (Environment Agency)
GCN	great crested newt
GDP	gross domestic product
GHG	greenhouse gas(es)
GI	ground investigation or galvanised iron
GIS	geographical information system
GP	general practitioner
GRIP 3	Governance for Railway Investment Projects (Stage 3) process
GSP	grid supply point

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Abbreviation	Meaning
GSPZ	groundwater source protection zone(s)
GVA	gross value added
GWDTE	groundwater dependent terrestrial ecosystem(s)
GWML	Great Western Main Line
GWSI:HERDS	Generic written scheme of investigation: historic environment research and delivery strategy
HAWRAT	Highways Agency Water Risk Assessment Tool
HCA	Homes and Communities Agency
HDV	heavy duty vehicle(s)
HE	Highways England
HER	historic environment record
HFC	hydrofluorocarbons
HGV	heavy goods vehicle(s)
HLCA	Historic Landscape Character Areas
HLS	Higher Level Stewardship
HIA	health impact assessment
HOST	Hydrology of soil types
HQ	TUFLOW Flow-Head layer
HRA	habitat regulations assessment
HS1	High Speed One
HS2	High Speed Two
HS2 Ltd	High Speed Two Limited
HSE	Health and Safety Executive
HSI	Habitat Suitability Index

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Abbreviation	Meaning
HSR	High Speed Rail
HSWA	Health and Safety at Work etc. Act 1974
HVAC	heating, ventilation and air-conditioning
HX	Polyline layer providing 1 dimensional-2 dimensional link within TUFLOW
IAG	Interdepartmental Analysts Group
IAQM	Institute of Air Quality Management
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICE	Institution of Civil Engineers
ICOMOS	International Council on Monuments and Sites
ICS	International Classification for Standards
ID	identification
IEEM	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Management and Assessment
IEP	Intercity Express Programme
IHBC	Institute of Historic Building Conservation
IMD	infrastructure maintenance depot
IPC	integrated pollution control
IoMD	Index of Multiple Deprivation
IPCC	Intergovernmental Panel on Climate Change
IPCC AR5	IPCC's 5th Assessment Reports
IPEG	increased potential for elevated groundwater
IPPC	integrated pollution prevention control
ISIS	one-dimensional hydraulic modelling software developed by Halcrow

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Abbreviation	Meaning
ISO	International Organisation for Standardisation
ITA	Integrated Transport Authority
JNCC	Joint Nature Conservation Committee
LpAeq	equivalent continuous A-weighted sound pressure level
LpAeq,T	equivalent continuous A-weighted sound pressure level for the time period T
Lpeq	equivalent continuous sound pressure level
LpAeq, day	equivalent continuous sound pressure level [day – 07:00-23:00]
LpAeq, night	equivalent continuous sound pressure level [night – 23:00-07:00]
LpAFmax	maximum A-weighted sound pressure level measured with a fast time constant
LpASmax	maximum A-weighted sound pressure level measured with a slow time constant
LAQM	local air quality management
LBAP	local biodiversity action plan(s)
LCA	landscape character area(s)
LCLIP	Local Climate Impacts Profile
LDA	London Development Agency
LDC	Lichfield District Council
LDD	local development document(s)
LDF	local development framework(s)
LDV	Light Duty Vehicle
LEAP	locally equipped area of play
LEMP	local environmental management plan(s)
LEP	local enterprise partnership
LEZ	low emission zone(s)

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Abbreviation	Meaning
LFRMS	local flood risk management strategy
LGBCE	Local Government Boundary Commission for England
LGS	local geological site(s) (formerly regionally important geological sites)
LGV	light goods vehicle(s)
LIFE	Lotic-invertebrate Index for Flow Evaluation
LIGS	locally important geological site(s)
LiDAR	light detection and ranging
LIP	local implementation plan(s)
LLAU	Limits of Land to be Acquired or Used
LLFA	lead local flood authority
LNR	local nature reserve(s)
LPA	local planning authority(/ies)
LSOA	lower super output area(s)
LTP	local transport plan(s)
LULUCF	Land use, land use change and forestry
LWS	local wildlife site(s)
M and E	mechanical and electrical
MAP	maintenance access point
MAFF	Ministry of Agriculture, Fisheries and Food
MCA	mineral consultation area
MCC	manual classified count
MDp	moisture deficit (potatoes)
MDU	maintenance delivery unit

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Abbreviation	Meaning
MDw	moisture deficit (wheat)
MEP	mechanical and electrical plant
MLP	minerals local plan
MMG	Mercia Mudstone Group
MML	Midland Main Line
MMP	materials management plan
MoD	Ministry of Defence
MOL	metropolitan open land
MRF	material recycling facility
MSA	mineral safeguarding area
MTBE	methyl tert-butyl ether
MUGA	multi-use games area
MWIA	Mental wellbeing impact assessment
N/A	not applicable
NAP	National Adaptation Programme
NBC	Newcastle under Lyme Borough Council
NBR	National Buildings Record
NCA	national character area(s)
NCR	National Cycle Route
NE	Natural England
NFU	National Farmers Union
NGCLC	National Groundwater & Contaminated Land Centre
NGO	non-governmental organisation

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Abbreviation	Meaning
NHL	National Heritage List
NHLE	National Heritage List for England
NHS	National Health Service
NI/TR Policy	Noise insulation and temporary re-housing policy
NMR	National Monuments Record
NNR	national nature reserve(s)
NOMIS	Service provided by the Office for National Statistics to provide UK labour market statistics
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NT	National Trust
NPV	Net Present Value
NR	Network Rail
NTEM	National Trip End Model
NTM	National Transport Model
NTS	non-technical summary
NVC	National Vegetation Classification
NVQ	National Vocational Qualification(s)
NVZ	nitrate vulnerable zone(s)
OA	optimised alternative
OAPF	opportunity area planning framework
OELS	Organic Entry Level Stewardship
OD	Ordnance Datum
Ofsted	Office for Standards in Education

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Abbreviation	Meaning
OfWAT	The Water Services Regulation Authority
OLE	overhead line equipment
ONS	Office for National Statistics
OS	Ordnance Survey
P/A	presence/absence
PAH	polycyclic aromatic hydrocarbons
PAS	Publicly Available Specification
PCB	polychlorinated biphenyls
PCU	passenger car unit(s)
PDFH	Passenger Demand Forecasting Handbook
PDM	Post Development Model(s)
PFM (also referred to as PLANET)	PLANET Framework Model
PFRA	preliminary flood risk assessment(s)
PHE	Public Health England
PLANET (also referred to as PFM)	Planning network transport forecast model
PLM	persons with limited mobility
PM ₁₀	particulate matter (with aerodynamic diameter of less than 10 micrometres)
PM _{2.5}	particulate matter (with aerodynamic diameter of less than 2.5 micrometres)
POS	public open space(s)
POT	peak(s) over a threshold
PPE	personal protective equipment
PPG	pollution prevention guidelines (Environment Agency)
PPGN	Planning Guidance on Noise

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Abbreviation	Meaning
PPS	Planning Policy Statement
PROPWET	Index of proportion of time that soils are wet
PRoW	public right(s) of way
PSC	population size class
PSED	Public Sector Equality Duty
PSI	proportion of sediment-sensitive invertebrates
PSYM	Predictive System for Multimetrics
PV	present value
PWS	public water supply
QMED	Median annual flood {with 1 in 2 (50%) annual probability event}
QRA	quantitative risk assessment
RAF	Royal Air Force
RBD	river basin district(s)
RBMP	river basin management plan
RC	Roman Catholic
RCS	river corridor survey(s)
RDA	regional development agency(ies)
ReFH	Revitalised Flood Hydrograph
RESTATS	Department of Energy and Climate Change Renewable Energy Statistics
RFC	ratio to flow capacity
RFI	radio frequency interference
RFRA	regional flood risk appraisal(s)
RIGS	regionally important geological and geomorphological site(s)

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Abbreviation	Meaning
RIM	reservoir inundation mapping
RHS	river habitat survey(s)
RICT	River Invertebrate Classification Tool
RIR	The Railways (Interoperability) Regulations 2011 (as amended)
ROGS	The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended)
RP	Rail Package
RSMD	rolling stock maintenance depot
RPG	registered park and garden
RPZ	root protection zone
RRB	route refinement baseline
RSPB	Royal Society for the Protection of Birds
RSS	regional spatial strategy
RSSB	Rail Safety and Standards Board
SA	sustainability appraisal
SAAR	Standard Average Annual Rainfall
SAB	SuDS Approval Body
SAC	special area of conservation
SBC	Stafford Borough Council
SBI	site(s) of biological importance/site(s) of borough importance
SBI. I	site(s) of biological importance - Grade I
SBI. II	site(s) of biological importance - Grade II
SCC	Staffordshire County Council
SDC	Stafford District Council

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Abbreviation	Meaning
SEEBP	South East England Biodiversity Partnership
SER	Staffordshire Ecological Record
SES	Supplementary Environmental Statement
SFRA	strategic flood risk assessment(s)
SIL	strategic industrial land
SINC	site(s) of importance for nature conservation
SLA	special landscape area(s)
SLI	site(s) of local importance
SLINC	site of local importance for nature conservation
SMI	site(s) of metropolitan importance
SMR	Scope and Methodology Report
SMINC	site(s) of metropolitan importance for nature conservation
SNCI	site(s) of nature conservation interest
SO27A	Parliament's Private Business Standing Order 27A
SPA	special protection area(s)
SPD	supplementary planning document(s)
SPG	supplementary planning guidance
SPL	slowly permeable layer
SPR	Standard percentage runoff
SPRHOST	Standard percentage runoff derived using the HOST soil classification
SPZ	groundwater source protection zone(s)
SPZ1	source protection zone 1
SRN	strategic road network

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Abbreviation	Meaning
SSSI	site(s) of special scientific interest
STCC	Stoke-on-Trent City Council
STM	SATURN transport model
STP	station travel plan(s)
SuDS	sustainable drainage system(s)
SVOC	semi-volatile organic compounds
SXZ	Point layer providing 1D-2D link within TUFLOW
SWC	surface water crossing(s)
SWMP	site waste management plan(s)
TA	transport assessment
TBC	Tamworth Borough Council
TBM	tunnel boring machine(s)
TDM	Technical Design Manual
TEMPRO	Trip End Model Presentation Program
TGV	Train à Grande Vitesse (English: 'high-speed train'), France's high-speed rail service
TIN	technical information note(s)
TMP	traffic management plan(s)
TPC	travel plan coordinator(s)
TPO	tree preservation order(s)
Tp(o)	Time to peak of the instantaneous unit hydrograph
TRaCCA	Tomorrow's Railway and Climate Change Adaptation
TRANSEC	Transport Security & Contingencies Directorate (regulator)
TSI	Technical Specification for Interoperability

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Abbreviation	Meaning
TTWA	travel to work area(s)
TUFLOW	Two-dimensional hydraulic modelling software built by BMT WBM
UCZ	utilities construction zone
UDP	unitary development plan(s)
uFMfSW	Updated Flood Map for Surface Water
UK	United Kingdom
UKAPIS	UK Air Pollution Information System
UKCCRA	UK Climate Change Risk Assessment
UKCIP	United Kingdom Climate Impacts Programme
UKCP09	United Kingdom Climate Projections 2009
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UKFS	UK Forestry Standard
URBAN	Flood Studies Report index of fractional urban extent
URBEXT ₁₉₉₀	FEH index of fractional urban extent
URBEXT ₂₀₀₀	Revised index of urban extent, measured differently from URBEXT ₁₉₉₀
UST	underground storage tank(s)
UXO	unexploded ordnance
WC	wetness class
VCP	vitrified clay pipe
VDV	vibration dose value
VOA	Valuation Office Agency
VOC	volatile organic compound

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Abbreviation	Meaning
WC	wetness class
WCA	Wildlife and Countryside Act
WCS	water cycle strategy(ies)
WCML	West Coast Main Line
WebTAG	Web Transport Analysis Guidance
WFD	Water Framework Directive
WHO	World Health Organisation
WPD	Western Power Distribution
WPZ	water protection zone(s)
WRAP	Waste and Resources Action Programme
WSI	written scheme(s) of investigation
ZTV	zone(s) of theoretical visibility

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