



Grand Union
Canal Transfer

Grand Union Canal Transfer

Environmental Impact Assessment
Scoping Report

Volume 1: Main Report

Affinity Water, Severn Trent and Canal & River Trust

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Prepared for:

Affinity Water, Severn Trent and Canal & River Trust

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Glossary and Abbreviations

Glossary

Term	Definition
Abbey Shale Formation	Dark grey, greenish or blueish black mudstones with thin beds of limestone and glauconitic sandstone.
Access Land	Land where the public have access either by legal right or by informal agreement.
Applicants	The Applicants for the Development Consent Order (DCO) application of the Proposed Development are Affinity Water (AfW) and Severn Trent (ST). The Canal & River Trust (the Trust) may decide to also be an Applicant by the time of DCO application submission.
Application	The application for a DCO for the Proposed Development submitted by the Applicants.
Aquatic Invertebrates	Water-dwelling organisms without a backbone, such as insects, worms, or molluscs.
Aquifer Designation	The Environment Agency helps to protect groundwater by identifying different types of aquifer, both bedrock and superficial deposits (drift).
Aquifer Designation – Principal Aquifer	Layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
Aquifer Designation – Secondary A Aquifer	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.
Aquifer Designation – Secondary B Aquifer	Predominantly lower permeability layers which may store /yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
Aquifer Designation – Secondary Undifferentiated Aquifer	Aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type.
Aquifer Designation – Unproductive strata	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
ARROW	Soil association of deep permeable coarse loamy soils affected by groundwater.
A-Weighting	A-weighting is an electronic filter that matches the response of a sound level meter to what humans actually perceive. When A-weighted the Sound

Term	Definition
	Pressure Level Lp becomes LpA (or LA) and the Sound Power Level LW becomes LWA.
BARDSEY	Soil association of slowly permeable seasonally waterlogged loamy over clayey and fine silty soils over soft rock.
Baseline Conditions	The environmental conditions that exist prior to Proposed Development and against which impacts will be assessed.
Baseline Studies	Work done to determine and describe the environmental conditions against which any future changes can be measured or predicted and assessed.
BATCOMBE	Fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal water logging.
BEARSTED1	Well drained coarse loamy and sandy soils over sand or sandstone, in places ferruginous.
Best and Most Versatile (BMV) Agricultural Land	Agricultural land of excellent (Grade 1), very good (Grade 2) and good (Subgrade 3 a) agricultural quality as defined under the National Planning Policy Framework.
Biological Constraints	Presence of protected species, habitats, and ecosystems.
BROCKHURST1	Soil association of slowly permeable seasonally waterlogged reddish fine loamy over clayey soils.
BROMSGROVE	Soil association of well drained reddish coarse loamy soils mainly over soft sandstone but deep in places.
CAMS Status – Restricted Water Available for Licensing	Groundwater unit balance shows more water is licensed than the amount available, but that recent actual abstractions are lower than the amount available OR that there are known local impacts likely to occur on dependent wetlands, groundwater levels or cause saline intrusions but with management options in place.
CAMS Status – Water Available for Licensing	Groundwater unit balance shows groundwater available for licensing.
CAMS Status – Water not Available for Licensing	Groundwater unit balance shows more water has been abstracted based on recent amounts than the amount available.
Characterisation (of Landscape)	The process of identifying areas of similar landscape character, classifying and mapping them and describing their character.
Charmouth Mudstone Formation	Dark grey laminated shales, and dark, pale and bluish grey mudstones.

Term	Definition
CO ₂ equivalent (CO ₂ e)	A measure of how much a gas contributes to global warming, relative to carbon dioxide (CO ₂), by multiplying the mass of the gas (in tonnes), by the gas' global warming potential (GWP).
Compensation	Measures devised to offset for residual adverse effects which cannot be prevented/avoided or further reduced.
Competent Authority	The authority which determines the application for consent, permission, licence or other authorisation to proceed with a proposal. It is the authority that must consider the environmental information before granting any kind of authorisation.
COMPTON	Soil association of stoneless mostly reddish clayey soils affected by groundwater.
Conservation Area	An area of special environmental or historic interest or importance, of which the character or appearance is protected (Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990).
Consultation Bodies	Any 'body' specified in the relevant EIA Regulations which the competent authority must consult in respect of an EIA, and which also has a duty to provide information.
Consultation Report	A report forming part of the DCO application, outlining the consultation undertaken on the Proposed Development.
Contaminated Land: Application in Real Environments (CL:AIRE)	Framework for assessing the sustainability of soil and groundwater remediation.
COOMBE1	Well drained calcareous fine silty soils deep in valley bottoms,
Crashmap	An online website which provides access to maps and information about crashes on roads based on official data published by the Department for Transport.
Cumulative Effects	The collective term for inter and intra project effects. The inter project effects are the combined effects of several development schemes which may, on an individual basis be insignificant but, cumulatively with the Proposed Development, have a new or different likely significant effect. The intra project effects are defined in this table under 'Effect interactions'.
Decibel (dB)	The decibel unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.

Term	Definition
Demographic and Economic Data / Indicators	Statistical data that provides information about the population (demographic) and the economy (economic), such as age, income, employment rates, etc.
Deployable Output	Deployable output is defined in section 235 of the Planning Act 2008, in relation to a given facility, as the annual average volume of water that can be produced per day from that facility under drought conditions, having regard in particular (where applicable) to (a) the hydrological yield of the facility; (b) the quantity of water licensed for abstraction; (c) the state of the local environment; (d) the properties of any — (i) pumping plant; (ii) well; (iii) aquifer; (iv) raw water main; (v) aqueduct; (vi) transfer main; (vii) output main; (e) any water treatment processes; (f) any requirements relating to water quality.
Designated Landscape	Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.
Desk Study	A review of existing information and data relevant to the environmental assessment, typically sourced from literature, maps, and databases.
Development	Any proposal that results in a change to the baseline environment.
Development Consent Order (DCO)	Development consent is required pursuant to the Planning Act 2008 for Nationally Significant Infrastructure Projects (NSIP). A development consent order is the order which grants development consent when an application is made to the Secretary of State (SoS).
Direct effect	An effect that is directly attributable to the Proposed Development.
Disaster	A disaster, in the context of major accidents and disasters (MA&D) assessment, is a naturally occurring phenomenon such as an extreme weather event (e.g. storm, flood, extreme temperatures) or ground-related hazard event (e.g. subsidence, landslide, earthquake) with the potential to cause an event or situation that leads to immediate or delayed serious damage the environment and requires the use of resources beyond those of the Applicant or its contractors to manage.
'Do Nothing' Situation	Continued change or evolution of the baseline in the absence of the Proposed Development.

Term	Definition
Drinking Water Protected Area	Drinking Water Protected Areas (Surface Water) are, within the Water Framework Directive (WFD), where raw water is abstracted from rivers and reservoirs. Raw water needs to be protected to ensure that it is not polluted which could lead to additional purification treatment. To do this water companies and the Environment Agency identify raw water sources that are 'at risk' of deterioration which would result in the need for additional treatment. These zones are areas where the land use is causing pollution of the raw water. Action is targeted in these zones to address pollution so that extra treatment of raw water can be avoided.
Drinking Water Safeguard Zones	Catchment areas that influence the water quality for their respective Drinking Water Protected Area (Surface Water), which are at risk of failing the drinking water protection objectives. These non-statutory Safeguard Zones are where action to address water contamination will be targeted, so that extra treatment by water companies can be avoided.
Dyrham Formation	Pale to dark grey and greenish grey, silty and sandy mudstone, with interbeds of silt or very fine-grained sand (locally muddy or silty), weathering yellow.
EARDISTON2	Soil association of well drained often reddish coarse loamy soils over sandstone.
Effect Interactions (In-combination effects)	The combined effects of different environmental aspects (e.g. air quality and noise) on a single receptor.
EIA Regulations	The EIA Regulations relevant to the Proposed Development are The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. These transpose the requirement of an EIA for NSIP developments. The EIA Regulations specify which developments are required to undergo EIA and Proposed Developments relevant to the NSIP planning process are listed under either of 'Schedule 1' or 'Schedule 2' of the EIA Regulations.
EIA Scoping Boundary	An EIA Scoping Boundary has been adopted for the purposes of this EIA Scoping Report to define the potential extent of land currently assumed to be necessary to construct, operate and maintain the Proposed Development. The extent of works associated with the Proposed Development, as shown by the EIA Scoping Boundary, is subject to change as the Proposed Development design progresses, taking into account the findings of the ongoing environmental and technical assessments

Term	Definition
	and consultation responses. It is however considered to provide a sound basis for the purpose of identifying potential significant environmental effects.
Elements (of Landscape)	Individual parts which make up the landscape, such as, e.g., trees, hedges and buildings.
Enhancement	Proposals that seek to improve the environmental resource, over and above its baseline condition.
Environmental Constraints	The limitations and challenges posed by the natural and built environment that can affect the planning, design, and implementation of a project. These constraints can include: • Physical constraints: Natural features such as topography, geology, hydrology, and climate conditions. • Biological constraints: Presence of protected species, habitats, and ecosystems. • Socio-economic constraints: Land use patterns, cultural heritage sites, and community concerns. • Regulatory constraints: Compliance with environmental laws, regulations, and policies. These constraints are identified and analysed during the EIA process to ensure that potential negative impacts are minimised and appropriate mitigation measures are implemented.
Environmental Effect	The consequence of an action (impact) upon the environment such as the decline of a breeding bird population as a result of the removal of hedgerows and trees.
Environmental Impact	The change in the environment as a result of a development.
Environmental Impact Assessment (EIA)	A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making. The EIA for the Proposed Development has been undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Statement (ES)	A statement that includes the information that is reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile, but that includes at least the information referred to in the EIA Regulations.

Term	Definition
EVESHAM	Slowly permeable calcareous clayey soils.
EVESHAM3	Slowly permeable calcareous clayey, and fine loamy over clayey soils.
Examining Authority	The person(s) appointed by the Secretary of State (SoS) to assess the Application and make a recommendation on the decision to the SoS.
Fast (F) Weighting	A time weighting that responds rapidly to changes in sound level, with a time constant of 125 milliseconds. This weighting is ideal for capturing sounds that don't vary too quickly. It offers a more detailed representation of the sound compared to slow weighting, though it may not be ideal for measuring extremely fast sounds.
Feature	Particularly prominent or eye-catching elements in the landscape, such as tree clumps, church towers or wooded skylines OR a particular aspect of the project proposal.
Field Capacity	The condition in which the soil large pores are saturated with water and any further water from rainfall will create waterlogging.
FLADBURY1	Stoneless clayey soils, in places calcareous variably affected by groundwater.
Flood Zone 1 (Low Probability)	Land that has a low probability of flooding (less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)).
Flood Zone 2 (Medium Probability)	Land that has a medium probability of flooding (between 1 in 100 and 1 in 1,000 annual probability of river flooding (0.1-1%), or between 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.1-0.5%)).
Flood Zone 3a (High Probability)	Land that has a high probability of flooding (1 in 100 year or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%)).
Flood Zone 3b (The Functional Floodplain)	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: •Land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or, •Land that is designed to flood (such as a flood attenuation Proposed Development), even if it

Term	Definition
	would only flood in more extreme events (such as 0.1% annual probability of flooding).
Formwork	The temporary or permanent molds used to hold wet concrete in place until it hardens and achieves sufficient strength. It is a crucial component in the construction process, providing the necessary shape and support for concrete structures such as walls, slabs, columns, and beams.
Geodiversity	Refers to the variety of geological (rocks, minerals, fossils), geomorphological (landforms, processes), and soil features that exist within a particular area or on Earth as a whole. It includes the natural processes that have shaped the physical landscape, such as volcanic activity, erosion, sedimentation, and tectonic movements.
Geographical Information System (GIS)	A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.
Glaciolacustrine Deposits	Sand and gravel.
Green Infrastructure (GI)	Networks of green spaces and watercourses and water bodies that connect rural areas, villages, towns and cities.
Gross Impact	Overall impact before taking into account the impact of deadweight, displacement, leakage and substitution.
Groundwater Abstraction – Licensed Public Abstraction	If you want to abstract more than 20 cubic metres of water per day from an underground source you will need an abstraction licence. You should consider local water availability, location and other users when you plan your activities. Your local abstraction licensing strategy will help you see how much water is available in your area.
Groundwater Abstraction – Private Abstraction	Abstraction is the removal or diversion of water from the natural water environment by means including pumps, pipes, boreholes and wells.
Groundwater Dependant Terrestrial Ecosystem (GWDTE)	A terrestrial ecosystem of importance at Member State level that is directly dependent on the water level in or flow of water from a groundwater body (that is, in or from the saturated zone).
Groundwater Vulnerability	An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one-kilometre square grid.
Groundwater Vulnerability – High Risk	Areas that can easily transmit pollution to groundwater. They are characterised by high-leaching soils and the absence of low-permeability superficial deposits

Term	Definition
Groundwater Vulnerability – Low Risk	Areas that provide the greatest protection to groundwater from pollution. They are likely to be characterised by low-leaching soils and/or the presence of low-permeability superficial deposits.
Groundwater Vulnerability – Medium Risk	Areas that offer some groundwater protection. Intermediate between high and low vulnerability.
Groundwater Vulnerability – Unproductive	Areas comprised of rocks that have negligible significance for water supply or baseflow to rivers, lakes and wetlands. They consist of bedrock or superficial deposits with a low permeability that naturally offer protection to any aquifers that may be present beneath.
Halesowen Formation – Mudstone Siltstone and Sandstone	Grey-green, micaceous sandstone (litharenite), and grey-green mudstone, with thin coals and limestone beds known as the 'Spirobis' limestone, with local intraformational conglomerate, strata may be reddened, locally.
Hands Off Flow	A hands-off flow is a flow rate at which water abstraction must stop or be reduced. It is a threshold that protects low river flows from abstraction and ensures a minimum flow for in-river ecology.
HANSLOPE	Slowly permeable calcareous clayey soils.
Hazard	A hazard is defined as an event that may cause harm. Hazards for the purposes of the MA&D.
Head	Head is poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes.
Heavily Modified Water Body (HMWB)	A water body that has been significantly altered by human activity, which may include engineering for flood control or urban development. For instance, the River Tame has been categorized as an HMWB due to engineering works.
Heavy Goods Vehicle (HGV)	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Helsby Sandstone Formation	Fine- to medium-grained, locally micaceous, cross-bedded and flat-bedded sandstones, weathering to sand near surface.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Historic Environment Record (HER)	The record of archaeological and built heritage features in a county or district, usually held and maintained by the relevant County Council.

Term	Definition
Horizontal Directional Drilling arches (HDDA)	HDDA is a minimal impact trenchless method of installing underground utilities such as pipe, conduit, or cables in a relatively shallow arc or radius along a prescribed underground path using a surface-launched drilling rig. Directional boring offers significant environmental advantages over traditional cut and cover pipeline/utility installations.
Hydrological Connectivity	The connection between bodies of water, such as streams, rivers, and lakes, through surface or subsurface water flow.
Index of Multiple Deprivation (IMD)	The Index of Multiple Deprivation Score is an overall measure of multiple deprivation experienced by people living in an area.
Indicative Non-Work Area	The Indicative Non-Work Area includes areas of land where no works are proposed, however, which are required to operate the Proposed Development. For the avoidance of doubt, it is only Part 2 of the Proposed Development, where a differentiation between Indicative Work Areas and Non-Work Areas is necessary. For all other parts of the Proposed Development, there are no Non-Work Areas.
Indicative Work Area	The Indicative Work Area for Part 2 of the Proposed Development includes areas in which land, or rights over or under land, are anticipated, at this stage, to potentially be required for works associated with the Proposed Development.
Indirect Effects	Secondary impacts that occur as a result of a development or action, which are not directly caused by the development itself but are a consequence of it.
Indirect Employment	Employment growth arising through spending in the supply chain by activity on site (i.e. contracted out manufacturing and services).
Induced Employment	Employment generated through spending by workforce (direct employment) in the economy.
Invasive Non-Native Species	Plants or animals that are not native to an area and have the potential to cause harm to the environment, economy, or human health
Iterative Design Process	The process by which project design is amended and improved by successive stages of refinement which respond to growing understanding of environmental issues.
Joint Nature Conservation Committee (JNCC)	JNCC is the public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.

Term	Definition
Key Characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LA90,T	The A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval (T) measured using time weighting (F) and quoted to the nearest whole number of decibels.
LAeq,T	The A-weighted equivalent continuous sound pressure level over period (T). This is effectively the average sound pressure level over a given period. As the decibel is a logarithmic quantity the Leq is not a simple arithmetic mean value.
LAeq,Tr	The 'sound source being assessed', with the specific sound level being specified at the assessment location over a given reference time interval (Tr).
Land Cover	The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.
Land Use	What land is used for, based on broad categories of functional land cover, such as urban and industrial use and the different types of agriculture and forestry.
Landform	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation and physical processes.
Landscape	An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity
Landscape Character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Area	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Assessment	The process of identifying and describing variation in the character of the landscape and using this

Term	Definition
	information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive.
Landscape Character Types	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.
Landscape Classification	A process of sorting the landscape into different types using selected criteria but without attaching relative values to different sorts of landscape.
Landscape Effects	Effects on the landscape as a resource in its own right.
Landscape Quality (Condition)	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape Receptors	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Landscape Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Landscape Strategy	The overall vision and objectives for what the landscape should be like in the future, and what is thought to be desirable for a particular landscape type or area as a whole, usually expressed in formally adopted plans and programmes or related documents.
Landscape Value	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.
LAr,Tr dB	The specific sound level plus any adjustment made for the characteristic features of the sound.
Light Goods Vehicle	A commercial motor vehicle with a total gross weight of 3,500kg or less.
Local Economic Baseline Conditions	refer to the existing state of the economy in a specific area before any new development or changes are made.
Lower layer Super Output Areas	Lower layer Super Output Areas (LSOAs) are made up of groups of Output Areas (OAs), usually four or

Term	Definition
	five. They comprise between 400 and 1,200 households and have a usually resident population between 1,000 and 3,000 persons.
Lowest Observed Adverse Effect Level (LOAEL)	The lowest dose used that results in the appearance of an adverse effect on health and quality of life due to the noise.
Made Ground	Made Ground is an area where the pre-existing (natural or artificial) land surface is raised by artificial deposits.
Magnitude of Change	Refers to the degree, extent, and duration of an environmental change caused by a development
Major Accident	A major accident, in the context of a MA&D assessment, means an uncontrolled event caused by a man-made activity or asset that may result in immediate or delayed serious damage the environment and requires the use of resources beyond those of the Proposed Development or its contractors to manage. It should be noted that malicious intent is not accidental, however the outcome of such an incident may be the same and, therefore, the same mitigation measures may apply to both deliberate and accidental events.
Mancetter Shale Formation	Grey to dark grey, sporadically greenish, micaceous and pyritic mudstone with common current ripple-bedded sandy wisps.
Marlstone Rock Formation	Sandy, shell-fragmental and ooidal ferruginous limestone interbedded with ferruginous calcareous sandstone, and generally subordinate ferruginous mudstone beds.
Maximum Parameters	Maximum parameters define the reasonable worst-case extents of design elements of the Proposed Development, or factors arising from them, which are assessed within the EIA.
Merevale Shale Formation – Mudstone	Greyish green to dark grey mudstone with pale buff dolomitic bands and lenticles. Becomes darker and more carbonaceous downwards.
Midelney	Soil association of stoneless clayey soils mostly overlying peat.
Millstone Grit Group	Broadly upward-coarsening cyclic sequences of sandstone, siltstone and grey mudstone, with subordinate and typically thin coal seams and seatearth (palaeosol) horizons.
Minworth Wastewater Recycling Centre (WwRC)	The existing wastewater recycling centre at Minworth.

Term	Definition
Mitigation	Measures including any process, activity, or design to avoid, prevent, reduce, or, if possible, offset any identified significant adverse effects on the environment.
Monks Park Shale Formation	Grey micaceous shaly mudstones in lower part. Black, locally calcareous and phosphatic mudstones in upper part.
Moor Wood Sandstone Formation	Massive to convoluted sandstone and siltstone, with interbedded wavy-bedded micaceous and shaly mudstone.
National Policy Statement (NPS)	National Policy Statements are produced by government. They comprise the government's central policy documents for the development of nationally significant infrastructure.
National Road Traffic Forecast	A forecast for traffic demand, congestion and emissions in England and Wales.
National Transport Model	A multi-modal model of land-based transport in Great Britain, used to inform transport policy and roads strategy and produce road traffic forecasts.
National Trip End Model	A model forecast developed by the Department for Transport which identifies the growth in trip origin-destinations (or productions-attractions) up to 2051 for use in transport modelling.
Nationally Significant Infrastructure Projects (NSIP)	NSIPs are large scale developments such as certain new harbours, power generating stations (including solar farms), highways developments and electricity transmission lines, which require a development consent under procedures governed by the Planning Act 2008 (and amended by the Localism Act 2011).
Neutral Restored Opencast	Restored opencast coal workings. Slowly permeable seasonally waterlogged compacted fine loamy and clayey disturbed soils. Often stony with thin topsoils.
'No Development' Scenario	Refers to a situation where no additional water supply capacity is implemented. This would fail to meet the requirements for resilient water supplies outlined in the National Framework and Water Resources Management Plans.
Oadby Member	Diamicton, grey, weathering brown, characterised by Cretaceous and Jurassic rock fragments; subordinate lenses of sand and gravel, clay and silt. Clay, brown to grey, and silty clay, with chalk and flint fragments

Term	Definition
Outfall	The place where a river, drain, or sewer empties into the sea, a river, or a lake.
Outwoods Shale Formation	Interbedded grey burrowed, and dark-grey or greenish grey pyritic, mudstone. Beds of siltstone and sandstone increase in upper part
Oxpasture	Soil association of fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.
Parameters	A limit or boundary which defines the scope of a particular process or activity.
Part 1 of the Proposed Development	Section of the Proposed Development between Minworth and Atherstone and comprising the Minworth Advanced Water Treatment Plant (AWTP) and the Minworth to Atherstone pipeline.
Part 1a of the Proposed Development	This includes the Minworth AWTP, treatment wetland for Biologically Activated Carbon (BAC)/ Granular Activated Carbon (GAC) backwash supernatant return, and pumping station for flows from Minworth AWTP to the start of Minworth to Atherstone pipeline.
Part 1b of the Proposed Development	Minworth to Atherstone pipeline. Approximately 16 km gravity and pumped water main with break pressure tank, from Minworth AWTP to Atherstone outfall at Coventry Canal.
Part 2 of the Proposed Development	Canal upgrade works to the Coventry, Oxford and Grand Union canals, including installation of pumping stations and overflows to bypass locks, channel widening or pipe bypasses, height increases of existing bridges, raising of canal bank levels and modification of existing waste weirs and other works.
Part 3 of the Proposed Development	Works to Daventry and Drayton Reservoirs
Part 4 of the Proposed Development	Section of the Proposed Development towards an underground storage reservoir near Luton, comprising abstraction of water from the canal, raw water storage, Water Treatment Works and a transfer pipeline to an underground reservoir near Luton.
Part 4a of the Proposed Development	This includes an abstraction point on the Grand Union Canal, a water main to transfer the water from the abstraction point, a reservoir for bankside raw water storage, a proposed Water Treatment Works (WTW), and a pumping station.
Part 4b of the Proposed Development	This includes the transfer pipeline from abstraction point to an underground reservoir near Luton.

Term	Definition
Pennine Lower Coal Measures Formation	Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit.
Perception	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Photomontage	A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs.
Physical Constraints	Natural features such as topography, geology, hydrology, and climate conditions.
PM ₁₀	A size fraction of particulate matter that has an effective aerodynamic diameter of 10 µm and if inhaled is unlikely to pass beyond the upper respiratory tract.
PM _{2.5}	A size fraction of particulate matter that has an effective aerodynamic diameter of 2.5 µm and if inhaled may pass beyond the larynx.
POWYS	Soil association of shallow well drained loamy soils over rock.
Preliminary Ecological Appraisal (PEA)	Comprises a desk study, Phase 1 Habitat Survey (which categorises habitats to a broad level using the methodologies set out by Joint Nature Conservation Committee (JNCC) (1993 as amended) guidelines) and Protected Species Scoping survey (which includes preliminary survey work to identify the presence or potential presence of legally protected species).
Preliminary Environmental Information Report (PEIR)	The Preliminary Environmental Information Report (PEIR) provides the Preliminary Environmental Information (PEI) for the Proposed Development. PEI is defined in the EIA Regulations as: <i>“information referred to in Regulation 14(2) which – (a) has been compiled by the applicant; and (b) is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development).”</i>
Preliminary Risk Assessment (PRA)	A report that presents a summary of readily-available information on the geotechnical and/or geo-environmental characteristics of the site and provides a qualitative assessment of geo-

Term	Definition
	environmental and/or geotechnical risks in relation to the proposed development.
Principal Labour Market Catchment Area	The main geographical area from which a development or business draws its workforce.
Proposed Development	The Grand Union Canal Transfer Proposed Development that is subject to this EIA Scoping Report. The Proposed Development is split into four parts, as defined below.
Public Rights of Way (PRoW)	Rights across land exercisable by the public at all times.
Purley Shale Formation	Blocky to shaly red or maroon mudstone and siltstone at the base; green and grey fissile mudstones in the middle and red and green interbedded shaly mudstones at the top.
RAGDALE	Slowly permeable seasonally waterlogged clayey and fine loamy over clayey soils.
RAMSAR	Convention on Wetlands: An international treaty for the conservation and sustainable use of wetlands.
RCP8.5	Representing a change in temperature range of 3.2°C and 5.4°C by 2100.
Receptors	Any component of the natural environment, like plants, animals, habitats, or ecosystems, that could be potentially affected by a pollutant or environmental stressor, essentially acting as the "target" that experiences the impact of a contaminant released into the environment
Regulatory Constraints	Compliance with environmental laws, regulations, and policies.
Representative Concentration Pathways (RCP) - RCP6.0	Representing a change in temperature range of 2.0°C to 3.7°C by 2100.
Riparian	Pertaining to or situated on the banks of a river or watercourse.
River Terrace Deposits	Sand and gravel, locally with lenses of silt, clay or peat.
Rufford	Soil association of slowly permeable seasonally waterlogged reddish coarse loamy over clayey soils.
Salop Formation	Red and red-brown mudstone, and red-brown (mostly sublitharenite) sandstone containing beds of pebbly sandstone and conglomerate itself containing Carboniferous limestone and chert clasts.

Term	Definition
Schedule 1 and Schedule 2 Developments	Classifications under the EIA Regulations. Schedule 1 developments automatically require an EIA, while Schedule 2 projects require one only if they are likely to have significant environmental effects.
Scoping	The process of identifying the issues to be addressed by an EIA. It is a method of ensuring that an EIA focuses on the important issues and avoids those that are considered to be less significant.
Secretary of State (SoS)	A senior government official responsible for various departments. In this context, it refers to the official responsible for determining whether to grant a DCO.
Sensitive Receptor	A sensitive receptor refers to human beings or aspects of the environment that could be adversely affected by the Proposed Development. These receptors are typically vulnerable to changes or impacts on the baseline environment.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Serious Damage	Serious damage includes permanent or long-lasting damage to an environmental receptor that cannot be restored through minor clean-up and restoration efforts, and which requires the use of resources beyond those of the Proposed Development or its contractors to manage.
Sidmouth Mudstone Formation	Dominantly red-brown mudstone and siltstone with common grey-green reduction patches and spots.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Significant Observed Adverse Effect Level (SOAEL)	SOAEL, or Significant Observed Adverse Effect Level, is a term used to evaluate noise impacts. It acknowledges that noise deemed acceptable in a loud environment might not be suitable in a quieter setting. Therefore, developers and consultants must take the specific context of the location into account when assessing their proposals.
Socio-economic Constraints	Land use patterns, cultural heritage sites, and community concerns.

Term	Definition
Socio-economics	The study of how economic activity affects and is shaped by social processes. It involves understanding the relationship between economic activity and social life.
Soil Associations	Groupings of related soil series.
Soil Series	The lowest category in the soil classification system and are precisely defined based upon particle-size distribution, parent material (substrate) type, colour and mineralogical characteristics.
Soil Wetness Class	A classification of soil wetness according to depth and duration of waterlogging in the soil from Class 1 (least wet) to Class VI (wettest).
Sound	This is the physical phenomena of the transmission of energy through gaseous or liquid media via rapid fluctuations in pressure.
Source Protection Zone (SPZ) – Inner zone – SPZ1	This is defined as: “A groundwater SPZ1 is the area immediately around an abstraction point for domestic supply or for food production purposes. Groundwater in a SPZ1 is most vulnerable to pollution given the close proximity of the abstraction point and the water’s intended use for human consumption. It is defined within the Environmental Permitting (England and Wales) Regulations 2016 as one of the following. 1. The area within 50 metres of a point where the groundwater is abstracted for domestic supply or food production purposes. 2. The area where it takes groundwater that is intended to be used to supply water for domestic or food production purposes up to 50 days to travel to the groundwater abstraction point. For any given abstraction point, whichever area is largest applies.”
Source Protection Zone (SPZ) – Outer zone – SPZ2	This is defined as: “A groundwater SPZ2 is the area around an abstraction point for domestic supply or for food production purposes that meets one of the following definitions. 1. The area within 250 metres of the abstraction point if the maximum allowable annual volume, divided by 365, is less than 2,000 cubic metres per day. This is when this is authorised by either: • an abstraction licence under section 24 of the Water Resources Act 1991

Term	Definition
	• <i>the right to abstract small quantities under section 27 of the Water Resources Act 1991</i> 2. <i>The area within 500 metres of the abstraction point if the maximum allowable annual volume, divided by 365, is equal to or greater than 2,000 cubic metres per day. This is when this is authorised by an abstraction licence under section 24 of the Water Resources Act 1991</i> 3. <i>The area where it takes groundwater that is used to supply water for domestic or food production purposes up to 400 days to travel to the groundwater abstraction point.</i> <i>For any given abstraction point, whichever area is largest applies.”</i>
Source Protection Zone (SPZ)	SPZs show the risk of contamination from any activities that might cause pollution to groundwater sources such as wells, boreholes and springs used for public water supplies. The closer the activity, the greater the risk. SPZs can comprise of up to three main zones (inner, outer and total catchment). A fourth zone of special interest can also occasionally be applied to a groundwater source.
Stakeholders	The whole constituency of individuals and groups who have an interest in a subject or place.
Study Area	The spatial area within which environmental effects are assessed (i.e. extending a distance from the footprint of the Proposed Development in which environmental effects have the potential to occur). The study area may be different for the different parts of the Proposed Development, depending on the extent of works proposed within the specific part.
Subsoil	Layer (or horizon) of soil immediately beneath the surface topsoil. Generally, it is less structurally developed and less nutrient rich than the topsoil.
Suitable Alternative Natural Greenspace (SANG)	Designated areas used to mitigate the recreational impact on environmentally sensitive sites due to new residential developments.
Surface Water Features	Includes water bodies like rivers, lakes, canals, and any connected watercourses. For example, the Coventry Canal crosses several watercourses like the River Anker.
Susceptibility	The ability of a defined landscape or visual receptor to accommodate the specific proposed

Term	Definition
	development without undue negative consequences.
Sustainable drainage systems (SuDS)	Surface water drainage systems developed in line with the ideals of sustainable development (e.g. swales, ponds, basins, filtration flow control, etc).
TEMPRo	Trip End Model Presentation Program – is a software which allows users to view the NTEM dataset and provides forecast of end trips and associated documentation.
The All Company Working Group	The All Company Working Group (ACWG) which included Severn Trent and Affinity Water was set up to ensure that water companies with SROs were using a consistent approach where possible. The ACWG has commissioned a number of studies to identify where consistencies need to be made and how approaches can be aligned between different companies and SROs.
The Trust	Canal & River Trust
Threat	Threats for the purposes of the MA&D assessment are defined as malicious attacks.
Topsoil	Natural topsoil or manufactured topsoil, varies in depth with soil type but usually covering the top 20-30 cm in which plants can grow healthily.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.
UPTON1	Shallow well drained calcareous silty soils over chalk. Mainly on moderately steep, sometimes very steep land.
Vibration	Vibration is the transmission of energy through solid media by oscillation.
Visual Amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
Visual Effects	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors	People with views of the development or associated activities. These are located within the visual envelope and are typically residents, motorists, pedestrians, recreational users in residential areas

Term	Definition
	on publicly accessible roads, footpaths and open spaces.
Visualisation	A computer simulation, photomontage or other technique illustrating the predicted appearance of a development.
Volatile Organic Compounds	Organic chemicals that easily vaporize at room temperature due to their high vapor pressure and low water solubility.
Vulnerability	Vulnerability describes the susceptibility of an individual, a community, assets or systems to the impacts of hazards, either in terms of the likelihood of that experience or the extent to which an impact might result in an effect (and how reversible that effect might be). Within MA&D assessment, the term 'vulnerability' is used to describe the ability of the Proposed Development to plan, control, resist and recover from a MA&D event in a timely manner.
WANTAGE1	Well drained calcareous silty soils, in places shallow over argillaceous chalk.
Washout chamber	A designated area or container used to collect and contain the washout water and residual concrete from cleaning concrete trucks, mixers, and other equipment. This chamber helps prevent the discharge of pollutants into the environment by safely containing the caustic and potentially toxic washwater, which can harm aquatic life and soil if not properly managed
Water Framework Directive (WFD)	The Water Framework Directive ("WFD") introduced a new system for monitoring and classifying the quality of surface and ground waters. The Directive requires that Environmental Objectives be set for all surface waters and groundwater to enable them to achieve Good Ecological Potential/Status by a defined date.
Water Framework Directive Assessment	As part of its role, the Environment Agency must consider whether proposals for new developments have the potential to a) Cause a deterioration of a water body from its current status or potential; and/or b) Prevent future attainment of Good status (or potential where not already achieved). A WFD Assessment determines whether a Proposed Development is compliant with these criteria.
Water Supply Reservoir (WSR)	A facility used to store water, typically before it is treated or distributed.

Term	Definition
Water Treatment Works (WTW)	A facility that treats raw water to make it safe for human consumption.
Watercourse	A channel through which water flows, such as rivers, canals, or streams.
WFD groundwater body status – Good	Slight change from natural conditions as a result of human activity. No restriction on the beneficial uses of the water body. No impact on amenity or fisheries. Protect all but the most sensitive wildlife.
WFD groundwater body status – Poor	Major changes from natural conditions as a result of human activity. Some restrictions on the beneficial uses of the water body. Some impact on amenity. Moderate impact on wildlife and fisheries.
WFD Water Body	A river, lake, estuary, or coastal water defined by the Water Framework Directive for monitoring and management.
WHIMPLE2	Soil association of reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.
WHIMPLE3	Soil association of reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.
Whitby Mudstone	Medium and dark grey fossiliferous mudstone and siltstone, with thin siltstone or silty mudstone beds and rare fine-grained calcareous sandstone beds.
Wolston Glacigenic Formation	Predominantly tills, sands, gravels and laminated clays.
Zone of Influence (Zoi)	The area determined for each specialist study in which the construction or operation of the Proposed Development component has the potential to cause an adverse or beneficial effect on a receptor.
Zone of Theoretical Visibility (ZTV)	The zone within which views of a proposed development may be experienced, as determined by analysis of Ordnance Survey data and field survey. It is influenced by many factors including topography and intermediate visual intrusions, such as blocks of woodland and buildings.

Abbreviations

Term	Definition
µg	Microgram
A&E	Accident and Emergency
AADT	Annual Average Daily Total traffic Flow
ACWG	All Company Working Group
AEP	Annual Exceedance Probability
AfW	Affinity Water
Agl	Above ground level
AIA	Arboricultural Impact Assessment
ALARP	As Low as Reasonably Practicable
ALC	Agricultural Land Classification
AMP	Asset Management Plan
AOD	Above Ordnance Datum
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ARG UK	Amphibian and Reptile Groups of the United Kingdom
ARN	Affected Road Network
ARW	Ancient Replanted Woodland
ASNW	Ancient and Semi-Natural Woodland
AVDC	Aylesbury Vale District Council
AWTP	Advanced Water Treatment Plant
BAC	Biologically Activated Carbon
BAP	Biodiversity Action Plan
BAS	Biodiversity Action Site
BDP	Birmingham Development Plan
BGS	British Geological Survey
BMP	Biosecurity Management Plan
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BNL	Basic Noise Level
BNS	Biological Notification Site
BoCC	Birds of Conservation Concern
BPM	Best Practicable Means
BPT	Break Pressure Tank
BS	British Standard

Term	Definition
BSSS	British Society of Soil Science
BTS	Buckingham Transport Strategy
C&D	Construction & Demolition
CAMS	Catchment Abstraction Management Strategy
CBDP	Carbon Budget Delivery Plan
CCC	Climate Change Committee
CCRA	Climate Change Resilience Assessment
CDM	Construction Design Management
CDR	Concept Design Report
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIEH	Chartered Institute of Environmental Health
CifA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Application in Real Environments
CO	Carbon monoxide
CoCP	Code of Construction Practice
COMAH	Control of Major Accident Hazards
COSHH	Control of Substances Hazardous to Health
CPET	Chironomid Pupal Exuviae Technique
CRoW Act	Countryside Right of Way Act
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
CWS	County Wildlife Sites
DAS	Design and Access Statement
dB	Decibel
DBA	Desk Based Assessment
DCO	Development Consent Order
Defra	Department for Environment, Food & Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DfT	Department for Transport
DHRA	Development High Risk Area
DLUHC	Department for Levelling Up, Housing and Communities
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DO	Deployable Output

Term	Definition
DO	Dissolved Oxygen
DoWCoP	Definition of Waste: Development Industry Code of Practice
DPD	Development Plan Document
DRA	Dust Risk Assessment
EA	Environment Agency
EAR	Environmental Assessment Report
eDNA	Environmental Deoxyribonucleic Acid
EEA	European Economic Area
EFT	Emission Factors Toolkit
EIA	Environmental Impact Assessment
ENG	Environmental Net Gain
EPA	Environmental Protection Act
EPR	Environmental Permitting Regulations
EPS	European Protected Species
EQS	Environmental Quality Standard
ES	Environmental Statement
EWG	European Waste Catalogue
FAAG	Fisheries and Angling Advisory Group
FCD	Field Capacity Days
FRA	Fire Risk Assessment
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
GAC	Granular Activated Carbon
GBF	Global Biodiversity Framework
GCN	Great Crested Newts
GCR	Geological Conservation Review
GCS	Grid Connection Statement
GHG	Green House Gas
GI	Ground Investigation
GLVIA 3	Guidelines for Landscape and Visual Impact Assessment, Third Edition
GUC	Grand Union Canal
GVA	Gross Value Added
GWB	Groundwater bodies
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HDD	Horizontal Directional Drilling
HDV	Heavy Duty Vehicle
HER	Historic Environmental Records

Term	Definition
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessments
HLC	Historic Landscape Characterisation
HMSO	His Majesty's Stationery Office
HoF	Hands-off Flow
HRA	Habitats Regulations Assessment
HS2	High Speed 2 (rail project)
HSI	Habitat Suitability Index
HSI	Habitat Survey Index
IAQM	Institute of Air Quality Management
ICCI	In-Combination Climate Change Impact
ICE	Inventory of Carbon and Energy
IDB	Internal Drainage Board
IEF	Important Ecological Features
IEMA	Institute of Environmental Management and Assessment
IHBC	Institute of Historic Building Conservation
IMD	Index of Multiple Deprivation
INNS	Invasive Non-Native Species
IPCC	Intergovernmental Panel on Climate Change
JNCC	Joint Nature Conservation Committee
l/s	Litres per second
LCA	Land Character Area
LCRM	Land Contamination Risk Management
LCT	Land Character Type
LDV	Light Duty Vehicle
LERC	Local Environmental Record Centre
LGS	Local Geological Sites
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LOAEL	Lowest Observable Adverse Effect Level
LoD	Limit of Detection
LSE	Likely Significant Effects
LSOA	Lower Layer Super Output Areas
LWS	Local Wildlife Sites
m ³	Meters Cubed
m ³ /s	Meters Cubed per Second
MA&Ds	Major Accident and Disasters

Term	Definition
MAFF	Ministry of Agriculture, Fisheries and Food
MAGIC	Multi-Agency Geographical Information for the Countryside
MCA	Mineral Consultation Area
MHCLG	Ministry of Housing, Communities and Local Government
ML/d	Megalitres per day
mm	Millimetres
MPA	Minerals Planning Authority
MRS	Metal Recycling Sites
MSA	Mineral Safeguarding Area
NATMAP	National Soil Map of England and Wales
NBN	National Biodiversity Network
NCA	National Character Area
NCN	National Cycle Network
NE	Natural England
NHBC	National House Building Council
NHLE	National Heritage List for England
NHSNCA	National Health Service National Character Area
NIA	Nature Improvement Area
NIANE	No Identified Adverse Negative Effects
NNR	National Nature Reserve
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NOEL	No Observed Effect Level
NO _x	Oxidted of Nitrogen
NPPF	National Planning Policy Framework
NPPS	National Planning Policy Statement
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NPSWRI	National Policy Statement for Water Resources Infrastructure
NSR	Noise Sensitive Receptors
NVSR	Noise and Vibration Sensitive Receptor
OCTMP	Outline Construction Traffic Management Plan
Ofwat	The Water Services Regulation Authority
OHID	Office for Health Improvement & Disparities
ODMP	Outline Dust Management Plan
OLEMP	Outline Landscape and Ecology Management Plan
ONS	Office of National Statistics
OS	Ordnance Survey

Term	Definition
OSMP	Outline Soil Management Plan
OSSCEP	Outline Skills Supply Chain and Employment Plan
OSWMP	Outline Site Waste Management Plan
PAS	Publicly Available Specification
PEA	Preliminary Ecology Appraisal
PEAR	Preliminary Ecology Appraisal Report
PEIR	Preliminary Environmental Information Report
PHE	Public Health England
pLWS	Potential Local Wildlife Site
PPG	Planning Practice Guidance
PPV	Peak Partical Velocity
PR19	Price Review 19
PRoW	Public Rights of Way
PSYM	Predictive System of Multimetrics
RAPID	Regulators' Alliance for Progressing Infrastructure Development
RBMP	River Basin Management Plan
RCP	Represntitive Concentration Pathways
RHS	River Habitat Survey
RIG	Regionally Important Geodiversity
RIGS	Regionally Important Geodiversity Sites
RNR	Roadside Nature Reserve
RSPB	Royal Society for the Protection of Birds
RTWG	River Trent Working Group
SAC	Special Area of Conservation
SANG	Suitable Alternative Natural Greenspace
SFRA	Strategic Flood Risk Assessment
SIC	Standard Industrial Classification
SINC	Site of Importance for Nature Conservation
SNCI	Site of Nature Conservation Interest
SNRHW	Stable Non-Reactive Hazardous Waste
SOAEL	Significant Observed Adverse Effect Level
SoCC	Statement of Community Consultation
SoS	Secretary of State
SPA	Special Protection Area
SPZ	Source Protection Zone
SRO	Strategic Resource Option
SSSI	Site of Special Scientific Interest

Term	Definition
ST	Severn Trent
STT	Severn Trent Transfer
SuDS	Sustainable Drainage Systems
SVS	Social Value Strategy
SWMP	Site Waste Management Plan
TA	Transport Assessment
TBM	Tunnel Boring Machine
tCO ₂ e	Tonnes of carbon dioxide equivalent
TP	Travel Plan
TS	Transport Statement
TWL	Top Water Level
UKBF	The UK Biodiversity Framework
UKCP	United Kingdom Climate Projections
UKCP18	UK Climate Projections 2018
UKCPUXO	United Kingdom Climate Projections Unexploded Ordnance
UNESCO	United Nations Educational Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UXOTBM	Unexploded Ordnance Tunnel Boring Machine
VOC	Volatile Organic Compound
W&CA	Wildlife and Countryside Act 1981
WBCSD	World Business Council for Sustainable Development
WCC	Warwickshire County Council
WFD	Water Framework Directive
WHO	World Health Organization
WMP	Waste Management Plan
WMRG	West Midlands Ring Group
WPA	Waste Planning Authorities
WRAP	Waste and Resources Action Programme
WRI	World Resources Institute
WRMP	Water Resources Management Plan
WRSE	Water Resource South-East
WRW	Water Resources in the West
WRZ	Water Resources Zone
WSR	Water Supply Reservoir
WTW	Water Treatment Works
WW1	World War I
WW2	World War II
WwRC	Wastewater Recycling Centre

Term	Definition
Zol	Zone of Influence
ZTV	Zone of Theoretical Visibility



Chapter 1: Introduction

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1. Introduction

1.1 Purpose of this report

- 1.1.1 This Environmental Impact Assessment (EIA) Scoping Report has been prepared to accompany a request for an EIA Scoping Opinion from the Secretary of State (SoS) for Environment, Food and Rural Affairs, for the purposes of Regulation 10(1) of The Infrastructure Planning (Environmental Impact Assessment [EIA]) Regulations 2017 (as amended) (the 'EIA Regulations') (Ref. 1) for the Grand Union Canal (GUC) Transfer project (the 'Proposed Development').
- 1.1.2 The purpose of this EIA Scoping Report is to present the proposed scope of environmental aspects (topics) and matters (issues within each aspect) to be assessed and reported in an Environmental Statement (ES), in accordance with the EIA Regulations. This EIA Scoping Report also sets out the proposed method of assessment for each of the environmental aspects scoped in. The EIA Scoping Report has been prepared with regard to the Planning Inspectorate's (PINS) (2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements, (Version 7) (Ref. 2). The structure of this EIA Scoping Report is described in further detail in Section 1.5.
- 1.1.3 In October 2024, under Section 35 of the Planning Act 2008 (Ref. 3), the SoS directed that the Proposed Development be treated as a project for which development consent is required as the SoS was of the view that it is a project of national significance. The ES will accompany a Development Consent Order (DCO) application to be submitted to PINS acting under delegation on behalf of the relevant SoS.
- 1.1.4 The DCO application will be made by Affinity Water (AfW) and Severn Trent (ST) (the 'Applicants'). The Canal & River Trust (the 'Trust') may decide to also be an Applicant by the time of DCO application submission.
- 1.1.5 This chapter is supported by:
 - a. The following figure in Volume 2 of this EIA Scoping Report:
 - i. **Figure 1-1: Proposed Development Overview.**

1.2 The Proposed Development

- 1.2.1 The Proposed Development will transfer surplus water from ST's supply area to areas of forecast water deficit in AfW's supply area. From a new Advanced Water Treatment Plant (AWTP) to the north-east of Birmingham, a new buried pipeline will carry water to outfall into the Coventry Canal at Atherstone (two outfall locations are currently being considered). Existing canals will convey water to an abstraction point south of Milton Keynes (two locations are currently being considered) where water will then be stored and treated prior to its distribution to AfW customers.

- 1.2.2 The Proposed Development will utilise up to approximately 135 km of canal (Coventry Canal, Oxford Canal and Grand Union Canal) and will pass through ten local authority areas.
- 1.2.3 The principal components of the Proposed Development can be split into a number of parts as presented in **Table 1-1**. A detailed description of each part of the Proposed Development is presented in **Chapter 3: Description of the Proposed Development**.

Table 1-1: Principal components of the Proposed Development

Project Part	Principal Components
Part 1a – Minworth AWTP	Starting at the existing Minworth Wastewater Recycling Centre (WwRC) in the Royal Town of Sutton Coldfield, recycled water will be treated in a new Advanced Water Treatment Plant (AWTP) located on ST owned land just to the south-east of the existing WwRC.
Part 1b – Minworth to Atherstone Pipeline	From the Minworth AWTP, treated recycled water will be transferred east to the Coventry Canal at Atherstone, North Warwickshire, via a buried 1000 mm diameter pipeline, approximately 16 km in length. At the Atherstone end of the pipeline, two pipeline routes and associated outfall locations are currently being considered. These are described further in Chapter 3: Description of the Proposed Development .
Part 2 – Outfall and works to the Coventry, Oxford and Grand Union canals	From the outfall, water will travel south through the Coventry Canal and Oxford Canal and then into the Grand Union Canal. To manage flow velocities and water level changes within the canal network resulting from the water transfer, a range of new infrastructure developments, along with improvements to existing equipment, will be required. The new infrastructure will include new pumping stations at locks (uphill), weir bypasses around locks (downhill) and sections of bank raising. Stop locks are also being considered to reduce some of the lengths of bank raising and associated works.
Part 3 – Daventry and Drayton Reservoirs	The existing Daventry and Drayton reservoirs will be utilised to provide storage to ensure water supply is maintained during periods when there may be less water in the canal network. This will require some additional infrastructure and improvements to existing infrastructure at the reservoirs.

Project Part	Principal Components
Part 4a – Abstraction, Storage and Treatment	Water will be abstracted from the Grand Union Canal at one of two locations that are currently being considered where it will be stored and further treated to potable (drinking) water standards in a new Water Treatment Works (WTW). One of the sites (Site B) is located south of Milton Keynes near Bletchley. The other site (Site H) is located south of Leighton Buzzard near the village of Slapton. These are described further in Chapter 3: Description of the Proposed Development .
Part 4b – Pipeline to an underground reservoir near Luton	From the WTW, water will be transferred by a buried pipeline to an existing AfW water supply reservoir located near Luton. A number of pipeline corridors associated with the two Part 4a storage and treatment site options are currently being considered. These are described further in Chapter 3: Description of the Proposed Development .

- 1.2.4 A plan showing all Parts of the Proposed Development is presented in **Figure 1-1** in Volume 2 of this EIA Scoping Report.
- 1.2.5 The Proposed Development is located within the administrative areas of Birmingham City Council, North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Coventry City Council, Rugby Borough Council, Warwickshire County Council, West Northamptonshire Council, Milton Keynes City Council, Buckinghamshire Council and Central Bedfordshire Council. **Table 3-1** in **Chapter 3: Description of the Proposed Development** summarises the parts of the Proposed Development that fall within each local authority.
- 1.2.6 The Proposed Development is a central component of both the Revised Draft Regional Plan of Water Resources South East (Ref. 3) and AfW's Water Resources Management Plan 2024 (WRMP24) (Ref. 5). These plans establish the need for an increase in water resilience and identify an inter-regional water transfer scheme using the Grand Union Canal to transfer water from the Midlands to the south east as one of the solutions. It is also part of the Regulators' Alliance for Progressing Infrastructure Development's (RAPID) programme of Strategic Resource Options (SRO) to meet the water needs set out in the Environment Agency's National Framework (Ref. 6).
- 1.2.7 An EIA Scoping Boundary has been adopted for the purposes of this EIA Scoping Report to define the potential extent of land currently assumed to be necessary to construct, operate and maintain the Proposed Development. For Part 2 of the Proposed Development, the EIA Scoping Boundary has been divided into an Indicative Work Area and an Indicative Non-Work Area. The Indicative Work Area for Part 2 of the Proposed Development includes areas in which land, or rights over land, are anticipated, at this stage, to

potentially be required for works associated with the Proposed Development. The Indicative Non-Work Area includes areas of land where no works are proposed, however, which are required to operate the Proposed Development. For the avoidance of doubt, it is only Part 2 of the Proposed Development where a differentiation between Indicative Work Areas and Non-Work Areas is necessary. For all other parts of the Proposed Development, there are no Non-Work Areas.

- 1.2.8 The EIA Scoping Boundary for each Part is shown on the following figures in Volume 2 of the EIA Scoping Report:
- a. Part 1 of the Proposed Development: **Figures 3-4 to 3-5;**
 - b. Parts 2 and 3 of the Proposed Development: **Figure 3-6;** and
 - c. Part 4 of the Proposed Development: **Figures 3-7.**
- 1.2.9 The extent of works associated with the Proposed Development, as shown by the EIA Scoping Boundary, is subject to change as the Proposed Development design progresses, taking into account the findings of the ongoing environmental and technical assessments and consultation responses. It is however considered to provide a sound basis for the purpose of identifying potential significant environmental effects.
- 1.2.10 Further detail on the need for the Proposed Development and each of the component parts is presented in **Chapter 3: Description of the Proposed Development.**

1.3 The Requirement for Environmental Impact Assessment

- 1.3.1 The EIA Regulations (Ref. 1) govern the EIA process for Nationally Significant Infrastructure Projects (NSIP). A proposed development is 'EIA development' where it meets the project description and criteria listed in Schedule 1 of the EIA Regulations or it meets the project description and criteria listed in Schedule 2 of the EIA Regulations and it is determined through EIA Screening or voluntary submission that it is likely to give rise to significant environmental effects.
- 1.3.2 It is the Applicants' view that the Proposed Development does not meet any of the descriptions and criteria listed in Schedule 1, but could be considered to be development as described in Schedule 2, Part 10(o) Infrastructure Projects:
- "Works for the transfer of water resources between river basins not included in Schedule 1 to these Regulations".*
- 1.3.3 Schedule 2 Part 10(o) is considered to be the most directly relevant category as it involves the transfer of water resources between river basins, but for a project which does not, with certainty, meet the criteria in Schedule 1.
- 1.3.4 Schedule 3 of the EIA Regulations sets out the selection criteria for screening Schedule 2 development to see whether EIA is required. These are included under three main headings:

- a. Characteristics of development, including factors such as the size and design of the whole development, cumulation with other existing development and/or approved development and the use of natural resources, in particular land, soil, water and biodiversity;
 - b. Location of development, with a focus on the environmental sensitivity of geographical areas likely to be affected by the Proposed Development; and
 - c. Types and characteristics of the potential impact, including a consideration of factors such as the magnitude and spatial extent of the impact, the intensity and complexity of the impact and the possibility of effectively reducing the impact.
- 1.3.5 In summary, if a Schedule 2 development is considered to potentially result in significant environmental effects, then it should be subject to EIA and the DCO application should be accompanied by an ES. It is the Applicants' view, through applying the Schedule 3 criteria to the Proposed Development, that there is a clear requirement for the GUC Transfer project to be subject to EIA.
- 1.3.6 The Applicants have notified the SoS under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an ES in respect of the Proposed Development with the DCO application.

1.4 EIA Scoping Opinion Request

- 1.4.1 The EIA Scoping Opinion is sought from the SoS and the process is undertaken by PINS on behalf of the SoS. An EIA Scoping Report provides information to support such a request and can be used to help to inform both the EIA Scoping Opinion and formal consultation with statutory environmental bodies by PINS.
- 1.4.2 Regulation 10(3) of the EIA Regulations (Ref. 1) sets out the requirements for requesting an EIA Scoping Opinion stating that the request must include:
- a. A plan sufficient to identify the land;
 - b. A description of the proposed development, including its location and technical capacity;
 - c. An explanation of the likely significant effects of the development on the environment; and
 - d. Such other information or representations as the person making the request may wish to provide or make.
- 1.4.3 The purpose of this EIA Scoping Report is therefore to fulfil these requirements and also to:
- a. Provide a summary of the Proposed Development;
 - b. Set out the proposed scope of work and methods to be applied in carrying out the EIA;
 - c. Identify the likely significant environmental effects of the Proposed Development at an early stage of development to ensure they are

considered and addressed throughout the design and consenting process;

- d. Provide a justification and rationale for scoping out certain topics from further assessment (for example where no significant effects are predicted); and
- e. Set out the proposed structure and coverage of the ES to be submitted with the DCO application.

1.4.4 As referenced above, this EIA Scoping Report has been prepared in accordance with guidance provided by PINS Advice Note Seven (Ref. 2). **Table 1-2** lists the suggested requirements identified in Advice Note Seven and identifies where they are presented in this EIA Scoping Report.

Table 1-2: EIA Scoping Report content based on PINS Advice Note Seven

Suggested Content	Location in this EIA Scoping Report
<i>The Proposed Development</i>	
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development (e.g. design parameters).	Presented in Section 3.5 of Chapter 3: Description of the Proposed Development .
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development.	Chapter 3: Description of the Proposed Development is accompanied by a series of Figures that clearly show the EIA Scoping Boundary and key features for each part of the Proposed Development. These are included as Figures 3-4 to 3-7 in Volume 2 of this EIA Scoping Report.
<i>EIA Approach and Topic Areas</i>	
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option.	Presented in Chapter 4: Consideration of Alternatives .
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues.	A summary of topics scoped in and scoped out is presented in Chapter 24: Summary .
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided.	Each topic chapter (Chapters 8 to 22) presents a detailed explanation of matters to be scoped in and scoped out under the sub-heading 'Potential Effects'.
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters.	Each topic chapter (Chapters 8 to 22) presents under the sub-heading 'Baseline Conditions' a description of the of the desk

Suggested Content	Location in this EIA Scoping Report
	studies, surveys and studies that have informed the scoping decisions.
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect, e.g.: criteria for determining sensitivity and magnitude.	Chapter 6: EIA Approach presents the general approach adopted to assess impacts and determine the significance of effects. Topic-specific methods of assessment are presented in topic chapters (Chapters 8 to 22) under the sub-heading 'Approach to Assessment'.
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	Each topic chapter (Chapters 8 to 22) presents under the sub-heading 'Approach to Mitigation' the avoidance or mitigation measures that have been identified to date and the measures that could be adopted subject to further assessment.
Information Sources	
References to any guidance and best practice to be relied upon	General EIA guidance and best practice to be employed by the EIA Team is identified in Chapter 6: EIA Approach . Topic-specific guidance and best practice is identified within the topic chapters (Chapters 8 to 22).
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities).	Each topic chapter (Chapters 8 to 22) includes a sub-heading 'Consultation' to allow any agreements with consultation bodies to date to be captured.
An outline of the structure of the proposed ES.	The proposed structure of the ES is presented in Chapter 23: Structure of the Environmental Statement .
Transboundary Effects	
The Applicant may wish to provide a completed transboundary screening matrix.	A Transboundary Screening Matrix is included as Appendix 6-2 in Volume 3 of this EIA Scoping Report and is summarised in Chapter 6: EIA Approach .

1.5 Structure of the EIA Scoping Report

1.5.1 The EIA Scoping Report comprises three volumes:

- a. Volume 1: Main Report;
- b. Volume 2: Figures; and
- c. Volume 3: Appendices.

1.5.2 Volume 1 (this report) is structured as shown in **Table 1-3**. Volume 2 of the EIA Scoping Report comprises any figures referenced throughout the main

report (Volume 1), and Volume 3 includes any technical appendices that support the chapters in the main report (Volume 1).

Table 1-3: Structure of Volume 1: Main Report of the EIA Scoping Report

Chapter	Content
Chapter 1: Introduction	Introduces the Proposed Development, the requirement for EIA and the purpose and structure of the EIA Scoping Report.
Chapter 2: Legislation and Planning Policy Context	Presents the legislation and planning policy relevant to the scope of the EIA.
Chapter 3: Description of the Proposed Development	Provides a detailed description of the Proposed Development and identifies areas ongoing design evolution and the approach to uncertainty and flexibility in design, i.e. the 'Rochdale Envelope'.
Chapter 4: Consideration of Alternatives	Presents a summary of the key stages of optioneering work, the method of assessment and the main alternatives considered to date.
Chapter 5: Consultation	Presents an account of the consultation undertaken to date and the proposed consultation to be undertaken as part of the ongoing EIA process.
Chapter 6: EIA Approach	Presents the general approach to assessment of impacts, including defining impact magnitude, sensitivity of receptors and evaluating significance of effects.
Chapter 7: Other Assessments	Outlines the scope and approach to related assessments that sit outside the scope of the EIA, including Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment and Flood Risk Assessment (FRA).
Chapter 8 to 22: Topic Chapters	Each topic chapter sets out the current and future baseline conditions, the method of assessment to be adopted, the matters to be scoped in and scoped out and the approach to mitigation.
Chapter 23: Structure of the Environmental Statement	This chapter sets out the proposed structure of the ES, including the presentation of supporting figures and appendices.
Chapter 24: Summary	This chapters provides in a table format a summary of the matters to be scoped in and scoped out of the EIA for further assessment.

1.6 Competent Experts

- 1.6.1 Regulation 14(4) of the EIA Regulations (Ref. 1) requires that “...*in order to ensure the completeness and quality of the environmental statement - (a)*

the applicant must ensure that the environmental statement is prepared by competent experts; and (b) the environmental statement must be accompanied by a statement from the applicant outlining the relevant expertise or qualifications of such experts”.

- 1.6.2 AECOM, the ‘EIA Coordinator’, is an Institute of Environmental Management and Assessment (IEMA) Registered Impact Assessor and also holds the IEMA EIA Quality Mark as recognition of the quality of our EIA product and continuous training of our environmental consultants. A Statement of Competence will be included within the ES, outlining the relevant expertise or qualifications of the experts who prepared the ES.

1.7 References

- Ref. 1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at:
<https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 05/03/2025].
- Ref. 2 Planning Inspectorate (2020) Nationally Significant Infrastructure Projects – Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements. Available at:
<https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an#eia-scoping> [Accessed 05/03/2025].
- Ref. 3 Planning Act 2008. Available at:
<https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed 04/03/2025].
- Ref. 4 Water Resources South East (2023) Revised Draft Regional Plan, August 2023.
- Ref. 5 Affinity Water (2024) Draft Water Resources Management Plan, October 2024.
- Ref. 6 Environment Agency (2020) Meeting our future water needs: a national framework for water resources. Available at:
<https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources> [Accessed 05/03/2025].

Chapter 2: Legislation and Planning Policy Context

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2. Legislation and Planning Policy Context

2.1 Introduction

2.1.1 The purpose of this chapter is to provide an overview of the legislation and planning policy context relevant to the Environmental Impact Assessment (EIA) for the Proposed Development and which has informed the scope and method of assessment presented in this EIA Scoping Report. The chapter first outlines the primary legislation that governs the legal framework for obtaining development consent for the Proposed Development and subsequently provides a summary of the key policy documents that will be considered in the EIA process. Legislation and policies that are relevant to the topic-specific technical assessments are provided within **Chapters 8 to 22** of this EIA Scoping Report.

2.1.2 Legislation and policy relevant to the EIA will be kept under review and updated as necessary in the Environmental Statement (ES).

2.2 Legislation

Planning Act 2008

2.2.1 The Planning Act 2008 (Ref. 1) provides the primary legal framework for applying for, examining and determining Development Consent Order (DCO) applications for Nationally Significant Infrastructure Projects (NSIP).

2.2.2 The Secretary of State (SoS) for Environment, Food and Rural Affairs issued a direction under Section 35(1) of Planning Act 2008 on 1 October 2024 confirming that the Proposed Development should be treated as development for which development consent is required. Therefore, following the completion of surveys, assessments, and consultation processes outlined in this EIA Scoping Report, and taking account of the EIA Scoping Opinion, an application for a DCO will be made to the SoS for determination in accordance with the Planning Act 2008. The DCO application will be accompanied by an ES, in accordance with Regulation 5(2)(a) of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations') (Ref. 2).

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (As Amended)

2.2.3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations') (Ref. 3) govern the EIA process for DCOs.

2.2.4 The EIA Regulations specify which developments are required to undergo EIA and developments are categorised into 'Schedule 1' and 'Schedule 2'. Those developments listed in Schedule 1 must be subject to EIA, while developments listed in 'Schedule 2' must only be subjected to EIA, if they are considered "...likely to have significant effects on the environment by virtue of factors such as its nature, size or location". The Proposed Development is considered to fall under Schedule 2 paragraph 10(o) "...works for the

transfer of water resources between river basins not included in Schedule 1 to these Regulations”.

- 2.2.5 If a Schedule 2 development is considered to potentially result in significant environmental effects, then it should be subject to EIA and the DCO application should be accompanied by an ES. It is the Applicants' view, through applying the selection criteria for screening Schedule 2 development set out in Schedule 3 of the EIA Regulations criteria to the Proposed Development, that there is a clear requirement for the GUC Transfer project to be subject to EIA.
- 2.2.6 The issues that the Applicants consider the EIA will need to address are identified in this EIA Scoping Report in accordance with Planning Inspectorate's (PINS) Advice Note Seven (Ref. 4).
- 2.2.7 Further information on legislation relevant to the topic-specific technical assessments is presented within **Chapters 8 to 22** of this EIA Scoping Report.

2.3 Policy

National Policy Statement for Water Resources Infrastructure

- 2.3.1 In accordance with Section 104(2) of the Planning Act 2008 (Ref. 1), the SoS is required to have regard to the relevant National Policy Statement (NPS), amongst other matters, when deciding whether or not to grant a DCO.
- 2.3.2 The NPS relevant to the Proposed Development is the National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 5), which was published in April 2023. The NPSWRI sets out:
 - a. The urgent need for nationally significant water resources infrastructure;
 - b. The principles against which applications are expected be assessed and examined; and
 - c. The likely construction and operational impacts of national water resources infrastructure.
- 2.3.3 Section 1 of the NPSWRI sets out the background, scope and geographical coverage of the NPS, and the infrastructure covered by the NPSWRI. It also sets out the significance of water resource management plans (WRMPs) in terms of supporting decisions on “...*what additional water resources infrastructure is needed*” (paragraph 1.4.3).
- 2.3.4 Section 2 of the NPSWRI sets out government policy and the need for water resources infrastructure, including:
 - a. Current and predicted future pressure on water availability due to climate, demographic, economic and environmental factors;
 - b. The Government's commitment to pursue a “twin track approach” which requires both new water resources infrastructure and further demand management;

- c. Quantifying the need for new water resources infrastructure, the need to maintain the current level of resilience, and the regional planning process;
 - d. The role of WRMPs in identifying the need; and
 - e. The role of NSIPs.
- 2.3.5 Section 3 of the NPSWRI sets out the assessment principles for water resources DCOs, including a presumption in favour of granting development consent for water resources DCOs that fall within the need for infrastructure established in the NPS, subject to the detailed policies and protections in the NPSWRI. Section 3.6 of the NPSWRI also contains policies on the criteria for 'good design' for water resources infrastructure.
- 2.3.6 Section 4 of the NPSWRI sets out policy for generic impacts. This includes policy considering the construction and operational impacts of water resources NSIPs, including the assessments that an applicant will need to carry out, and the specific planning requirements that an applicant will need to meet, in order to gain development consent. It also sets out policies in relation to mitigation and decision making. Each topic chapter of the ES will incorporate these policies within the assessment. A summary of the relevant considerations for each topic-specific technical assessment is provided within **Chapters 8 to 22** of this EIA Scoping Report.

National Planning Policy Framework

- 2.3.7 The National Planning Policy Framework (NPPF) was revised most recently in February 2025 (Ref. 6) and sets out the Government's national planning policies for England. Paragraph 5 of the NPPF confirms that the NPPF may be a matter that is both important and relevant for the purposes of assessing DCO applications. Relevant policies of the NPPF are therefore to be considered in the EIA, albeit the NPS is the starting point for the consideration and determination of DCO applications.
- 2.3.8 The national Planning Practice Guidance (PPG) website (Ref. 7) provides more in-depth guidance to the NPPF specifically related to planning practice. The PPG is a suite of topic-specific online documents that aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date.
- 2.3.9 The EIA approach aligns with the procedures established by the PPG, which, in turn, ensures compliance with the NPPF. Topic-specific PPGs and policies from the NPPF are also considered, where appropriate, within the topic chapters (**Chapters 8 to 22**) of this EIA Scoping Report.

Local Planning Policy

- 2.3.10 Policies in local plans are frequently considered important and relevant matters and can influence the content of local impact reports in the determination of DCO applications (which the host local authorities will produce following submission of the DCO application), and which the SoS must have regard to in its decision making in accordance with the Planning Act 2008 (Ref. 1). The Proposed Development lies within the administrative areas of Birmingham City Council, North Warwickshire Borough Council (part

of Warwickshire County), Nuneaton and Bedworth Borough Council (part of Warwickshire County), Coventry City Council, Rugby Borough Council (part of Warwickshire County), West Northamptonshire Council, Milton Keynes City Council, Buckinghamshire Council, and Central Bedfordshire Council. A summary of the relevant local plans of these local authorities is set out within **Table 2-1**. The table includes both adopted and emerging local plans (noted with an *).

Table 2-1: List of relevant local plans

Local authority	Relevant local plan	Reference
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031	Ref. 8
	New Local Plan for Birmingham 2042*	Ref. 9
North Warwickshire Borough Council (part of Warwickshire County)	Local Plan for North Warwickshire 2021-2033	Ref. 10
Warwickshire County Council (part of Warwickshire County)	Council Plan 2022-2027	Ref. 11
Nuneaton and Bedworth Borough Council (part of Warwickshire County)	Adopted Nuneaton and Bedworth Borough Plan 2011-2031	Ref. 12
	Borough Plan Review 2021-2039*	Ref. 13
Coventry City Council	Coventry Local Plan (2011-2031)	Ref. 14
	Local Plan Review: Issues and Options Consultation (2023)*	Ref. 15
Rugby Borough Council (part of Warwickshire County)	Rugby Borough Local Plan 2011-2031	Ref. 16
	Rugby Borough Local Plan review – issues and options consultation (2023)*	Ref. 17
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1	Ref. 18
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District	Ref. 19
	New Local Plan for West Northamptonshire 2041*	Ref. 20
Milton Keynes City Council	Plan: MK 2016 – 2031	Ref. 21
	New City Plan: Ambition and Objectives Consultation 2023*	Ref. 22
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033	Ref. 23
	The Local Plan for Buckinghamshire – Draft Vision and Objectives*	Ref. 24

Local authority	Relevant local plan	Reference
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035	Ref. 25

[Key: * = *Emerging*]

Other Relevant Policy

- 2.3.11 Other policies which are likely to be important and relevant matters to the SoS's decision and are considerations for the technical assessments include 'A Green Future: Our 25 Year Plan to Improve the Environment' (published in 2018 and last updated in 2023) (Ref. 26) and the River Basin Management Plans (RBMP) for Humber and Anglian River Basin Districts (Ref. 27 and Ref. 28).
- 2.3.12 The 25 Year Environment Plan first published in 2018 and last updated in February 2023 sets out the Government's 25-year plan to improve the environment within a generation. It aims to achieve 10 goals which include: achieve thriving plants and wildlife; achieve clean air; achieve clean and plentiful water; manage exposure to chemicals and pesticides; maximise resources, minimise waste; use resources from nature sustainably; mitigate and adapt to climate change; reduce risk of harm from environmental hazards; enhance biosecurity; and enhance beauty, heritage and engagement with the natural environment. This plan therefore highlights the Government's support for the protection and enhancement of the natural environment; and ensuring land is managed with environmental gains.
- 2.3.13 The NPSWRI requires the consideration of the relevant RBMPs when assessing the likely impact of any proposed development on the water environment. The Proposed Development falls within the Humber, Severn and Anglian River Basin Districts and as such the RBMPs for these districts (Ref. 27 and Ref. 28) are relevant to the Proposed Development. The RBMPs describe the challenges that threaten the water environment relevant to each area and how these challenges can be managed.

Consideration of Planning Policy in EIA

- 2.3.14 **Chapters 8 to 22** of this EIA Scoping Report reference the policies relevant to the assessment of each environmental topic. The purpose of the EIA Scoping Report is not to assess the Proposed Development against planning policy, this will be undertaken and set out in a Planning Statement. The Planning Statement will be a separate document that will be submitted as part of the DCO application. The purpose of considering planning policy at the EIA scoping stage is twofold:
- To identify policy that could influence the sensitivity of receptors (and therefore the significance of effects) and any requirements for mitigation; and
 - To identify planning policy that could influence the methodology of the EIA.

2.4 References

- Ref. 1 Planning Act 2008. Available at:
<https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed 04/03/2025].
- Ref. 2 The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009. Available at:
<https://www.legislation.gov.uk/uksi/2009/2264/contents/made> [Accessed 04/03/2025].
- Ref. 3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at:
<https://www.legislation.gov.uk/uksi/2017/572/contents> [Accessed 04/03/2025].
- Ref. 4 Planning Inspectorate (2020) Nationally Significant Infrastructure Projects – Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements. Available at:
<https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an#eia-scoping> [Accessed 04/03/2025].
- Ref. 5 Department for Environment, Food & Rural Affairs (Defra) (2023) National Policy Statement for Water Resources Infrastructure. Available at:
https://assets.publishing.service.gov.uk/media/6437e3a2f4d420000cd4a1a7/E02879931_National_Policy_Statement_for_Water_Resources.pdf [Accessed 04/03/2025].
- Ref. 6 Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities & Local Government (MHCLG) (2018 to 2021) and Department for Levelling Up, Housing and Communities (DLUHC) (2025) National Planning Policy Framework – Last updated 7th February 2025. Available at:
<https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf> [Accessed 04/03/2025].
- Ref. 7 MHCLG and DLUHC (2024) Planning Practice Guidance. Available at:
<https://www.gov.uk/government/collections/planning-practice-guidance> [Accessed 04/03/2025].
- Ref. 8 Birmingham City Council (2017) Adopted Birmingham Development Plan. Available at:
https://www.birmingham.gov.uk/info/20054/planning_strategies_and_policies/78/birmingham_development_plan [Accessed 04/03/2025].
- Ref. 9 Birmingham City Council (2022) New Local Plan for Birmingham. Available at:
https://www.birmingham.gov.uk/info/20008/planning_and_development/2477/new_local_plan_for_birmingham [Accessed 04/03/2025].

- Ref. 10 North Warwickshire (2021) Local Plan for North Warwickshire. Available at: <https://www.northwarks.gov.uk/forward-planning/local-plan-north-warwickshire> [Accessed 04/03/2025].
- Ref. 11 Warwickshire County Council (2022) Council Plan. Available at: <https://www.warwickshire.gov.uk/strategies> [Accessed 04/03/2025].
- Ref. 12 Nuneaton and Bedworth Borough Council (2019) Adopted Borough Plan (2011-2031). Available at: <https://www.nuneatonandbedworth.gov.uk/adopted-borough-plan/borough-plan-1/2> [Accessed 04/03/2025].
- Ref. 13 Nuneaton and Bedworth Borough Council (2022) Borough Plan Review (2021-2039). Available at: <https://www.nuneatonandbedworth.gov.uk/adopted-borough-plan/borough-plan-1> [Accessed 04/03/2025].
- Ref. 14 Coventry City Council (2017) Coventry Local Plan 2011-2031. Available at: <https://www.coventry.gov.uk/planning-policy/coventry-local-plan-2011-2031> [Accessed 04/03/2025].
- Ref. 15 Coventry City Council (2023) Coventry Local Plan Review Issues and Options Consultation. Available at: <https://coventrycitycouncil.inconsult.uk/CLPRIO/consultationHome> [Accessed 04/03/2025].
- Ref. 16 Rugby Borough Council (2019) Rugby Borough Local Plan 2011-2031. Available at: <https://www.rugby.gov.uk/w/local-plan-2011-2031> [Accessed 04/03/2025].
- Ref. 17 Rugby Borough Council (2023) Local Plan Review Issues and Options Consultation. Available at: <https://www.rugby.gov.uk/w/local-plan-review-issues-and-options-consultation> [Accessed 04/03/2025].
- Ref. 18 West Northamptonshire Joint Planning Unit (2014) West Northamptonshire Joint Core Strategy Local Plan (Part 1). Available at: <https://www.westnorthants.gov.uk/west-northamptonshire-joint-core-strategy/west-northamptonshire-joint-core-strategy-local-plan-part> [Accessed 04/03/2025].
- Ref. 19 Daventry District Council (2020) Settlements and Countryside Local Plan (Part 2) For Daventry District 2011-2029. Available at: <https://www.westnorthants.gov.uk/planning-policy/daventry-local-plan-part-2> [Accessed 04/03/2025].
- Ref. 20 West Northamptonshire Council (2024) West Northamptonshire Local Plan – 2041 (Regulation 18) Consultation Draft April 2024. Available at: <https://www.westnorthants.gov.uk/planning-policy/new-local-plan-west-northamptonshire> [Accessed 04/03/2025].
- Ref. 21 Milton Keynes City Council (2019) Plan: MK 2016-2031. Available at: <https://www.milton-keynes.gov.uk/planning-and-building/developingmk/planmk> [Accessed 04/03/2025].

- Ref. 22 Milton Keynes City Council (2023) Our New City Plan: Ambition and Objectives Consultation 2023. Available at: <https://www.milton-keynes.gov.uk/planning-and-building/planning-policy/new-city-plan> [Accessed 04/03/2025].
- Ref. 23 Buckinghamshire Council (2021) Vale of Aylesbury Local Plan 2013-2033. Available at: https://buckinghamshire.gov-uk.s3.amazonaws.com/documents/Aylesbury_local_plan_L46JwaT.pdf [Accessed 04/03/2025].
- Ref. 24 Buckinghamshire Council (2023) The Local Plan for Buckinghamshire – Draft vision and objectives. Available at: https://buckinghamshire.gov-uk.s3.amazonaws.com/documents/Draft_vision_and_objectives_2_1.pdf [Accessed 04/03/2025].
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Chapter 3: Description of the Proposed Development

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3. Description of the Proposed Development

3.1 Introduction

3.1.1 This chapter of the EIA Scoping Report is structured as follows:

- a. Section 3.2 provides a summary of the Proposed Development;
- b. Section 3.3 provides an explanation of which parts of the Proposed Development are located within each of the host planning authorities' administrative areas;
- c. Section 3.4 provides a description of the existing site constraints within the EIA Scoping Boundary and its immediate surroundings. Further information on the baseline conditions is subsequently provided within the technical chapters (**Chapters 8 to 22**) of this EIA Scoping Report; and
- d. Sections 3.5-3.8 present a detailed description of the Proposed Development, which has been used to inform the scoping of environmental effects.

3.1.2 The need for the Proposed Development and alternatives considered to date are described within **Chapter 4: Alternatives and Design Evolution** of this EIA Scoping Report.

3.1.3 This chapter is supported by the following figures¹ within Volume 2 of this EIA Scoping Report:

- a. **Figure 3-1: Part 1 Environmental Constraints Plan;**
- b. **Figure 3-2: Parts 2 & 3 Environmental Constraints Plan;**
- c. **Figure 3-3: Part 4 Environmental Constraints Plan;**
- d. **Figure 3-4: Part 1a Minworth Advanced Water Treatment Plant Indicative Layout Plan;**
- e. **Figure 3-5: Part 1b Minworth to Atherstone Pipeline Indicative Layout Plan;**

¹ These plans show the EIA Scoping Boundary which has been adopted for the purposes of seeking input as to how the environmental assessment of the Proposed Development will be carried out. These are not consenting/planning application plans. The EIA Scoping Boundary is wider than the final Order limits (red line) for the application. Inclusion in this EIA Scoping Boundary does not mean that any feature or individual building is anticipated to be affected by physical works, please see the project description for detail. Existing buildings and other identified constraints will be excluded from the Order limits (red line) where possible. The Order limits as refined will be published and consulted on in the next stage of public consultation (currently expected to be Q4 2025/Q1 2026).

- f. **Figure 3-6: Parts 2 & 3 Canal Network Indicative Layout Plans;**
and
- g. **Figure 3-7: Part 4 Indicative Site Layout Plan.**

3.2 Summary of the Proposed Development

- 3.2.1 The Proposed Development will transfer surplus water from Severn Trent's (ST) supply area via up to approximately 135 km of canal to areas of forecast deficit in Affinity Water's (AfW) supply area. The transfer will start with the diversion of treated recycled water, which would otherwise have been discharged into the River Tame, from the existing Minworth Wastewater Recycling Centre (WwRC) to a new Advanced Water Treatment Plant (AWTP). A buried pipeline will transfer the treated water from the Minworth AWTP to an outfall to Coventry Canal near Atherstone. Two outfall locations at Atherstone are currently being considered. The Coventry, Oxford and Grand Union Canals will convey water to one of two locations that are currently being considered, where it will be abstracted, stored and further treated. One of the sites (Site B) is located south of Milton Keynes near Bletchley. The other site (Site H) is located south of Leighton Buzzard near the village of Slapton. Once the water has been abstracted from the canal, stored and treated, it will be transferred and then distributed to AfW customers. Works to the existing Daventry and Drayton Reservoirs are also proposed so that the reservoirs can be used to provide storage to augment the water transfer in the Grand Union Canal during periods when there may be less water in the canal network. This is in addition to their existing function to provide water for navigation along the canal.
- 3.2.2 The Proposed Development is split into the following main elements, described north to south, as shown on **Figure 1-1** in Volume 2 of this EIA Scoping Report:
- a. Part 1: Minworth to Atherstone;
 - i. Part 1a: Minworth AWTP;
 - ii. Part 1b: Minworth to Atherstone Pipeline;
 - b. Part 2: Outfall and other works to the Coventry, Oxford and Grand Union canals;
 - c. Part 3: Works to Daventry and Drayton Reservoirs;
 - d. Part 4: Abstraction, storage and treatment and pipeline to an underground storage reservoir near Luton:
 - i. Part 4a: Abstraction, Storage and Treatment; and
 - ii. Part 4b: Pipeline to an underground storage reservoir near Luton.
- 3.2.3 An EIA Scoping Boundary has been adopted for the purposes of this EIA Scoping Report to define the potential extent of land currently assumed to be necessary to construct, operate and maintain the Proposed Development. Where the area within the EIA Scoping Boundary contains existing buildings or other known environmental constraints, it is envisaged that ongoing design development will seek to avoid any works occurring to these features,

where possible (although some monitoring or protective works and/or existing buildings owned by the Trust² may be required for the Proposed Development). Therefore, although some buildings are indicated as being within the EIA Scoping Boundary, the physical works will not, as far as possible, interface with them. Development offsets from these features will be defined as part of ongoing design iteration of the Proposed Development.

- 3.2.4 For Part 2 of the Proposed Development, the EIA Scoping Boundary has been divided into an Indicative Work Area and an Indicative Non-Work Area. The Indicative Work Area for Part 2 of the Proposed Development includes areas in which land, or rights over or under land, are anticipated, at this stage, to potentially be required for works associated with the Proposed Development. It should be noted that works will not be required across the entirety of the Indicative Work Area, but the extent of the Indicative Work Area reflects the current need for flexibility, where Proposed Development's design details are not confirmed at this stage. The DCO application boundary will be refined to exclude existing buildings and other known environmental constraints, where possible (allowing retention for protective works but not compulsory acquisition as an objective), although it is anticipated some land in garden use may be within the Order limits.
- 3.2.5 The Indicative Non-Work Area includes areas of land where no works are proposed, however, which are required to operate the Proposed Development. For the avoidance of doubt, it is only Part 2 of the Proposed Development, where a differentiation between Indicative Work Areas and Non-Work Areas is necessary. For all other parts of the Proposed Development, there are no Non-Work Areas.
- 3.2.6 The EIA Scoping Boundary for each Part of the Proposed Development are shown on the following figures in Volume 2 of the EIA Scoping Report:
- a. Part 1 of the Proposed Development: **Figures 3-4 and 3-5;**
 - b. Parts 2 and 3 of the Proposed Development: **Figure 3-6;** and
 - c. Part 4 of the Proposed Development: **Figure 3-7.**
- 3.2.7 The EIA Scoping Boundary has been drawn to provide flexibility, where the Proposed Development's design details are not yet confirmed. As such, the EIA Scoping Boundary is subject to change as the Proposed Development design progresses, taking into account the findings of the ongoing environmental and technical assessments and consultation responses. It is however considered to provide a sound basis for the purpose of identifying potential significant environmental effects.
- 3.2.8 The geographical extent of the study areas used within the EIA will generally be greater than the EIA Scoping Boundary and will vary depending on the environmental aspect and specific receptors or resources under consideration for that aspect. For each aspect, the study area proposed is of

² The Trust is exploring practicable options along Parts 2 and 3 to utilise existing buildings within their ownership to (e.g.) house proposed pumping stations.

sufficient size to encompass the spatial extent over which relevant impacts on receptors or resources might occur. Each of the technical methodologies (**Chapters 8 to 22**) describes the study area to be considered, providing a clear explanation as to why the study area has been adopted. Further information on the spatial scope is also provided within **Chapter 6: EIA Approach**.

- 3.2.9 The Proposed Development will be designed to provide a maximum of 115 megalitres per day (Ml/d), as per the AfW's Water Resources Management Plan 2024 (WRMP24) (Ref. 1). The flow requirement will vary over the year.
- 3.2.10 The 115 Ml/d capacity would generate a 100 Ml/d Deployable Output³. A minimum throughput of 20% of the design flow must be maintained to ensure operability of the Minworth AWTP processes.
- 3.2.11 The flows would be transferred at a constant rate throughout the period of operation with ramp up and ramp down of flows being a gradual process. i.e. there will not be a shock increase in flows. Detailed controls over the volume and quality of discharges and abstractions under the Proposed Development will be agreed with and monitored by the Environment Agency through an Environmental Permit/Licence, where required. The operational regime of the Proposed Development will also be described in the ES.

3.3 Site Location by Local Authority

- 3.3.1 The Proposed Development crosses the administrative areas of ten local authorities: Birmingham City Council, North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Coventry City Council, Rugby Borough Council, Warwickshire County Council, West Northamptonshire Council, Milton Keynes City Council, Buckinghamshire Council and Central Bedfordshire Council. **Table 3-1** summarises the parts of the Proposed Development that fall within each local authority. All parts of the Proposed Development are then described individually in Section 3.5 of this chapter.

³ Deployable output is defined in section 235 of the Planning Act 2008 (Ref. 3), in relation to a given facility, as the annual average volume of water that can be produced per day from that facility under drought conditions, having regard in particular (where applicable) to (a) the hydrological yield of the facility; (b) the quantity of water licensed for abstraction; (c) the state of the local environment; (d) the properties of any— (i) pumping plant; (ii) well; (iii) aquifer; (iv) raw water main; (v) aqueduct; (vi) transfer main; (vii) output main; (e) any water treatment processes; (f) any requirements relating to water quality.

Table 3-1: Summary of Parts of the Proposed Development by Local Authority

Local Authority	Part of the Proposed Development	Elements
Birmingham City Council	1a	Minworth AWTP
North Warwickshire Borough Council / Warwickshire County Council	1b	Minworth to Atherstone Pipeline
	2*	Coventry Canal, from outfall structure at Atherstone to Nuneaton Road, Hartshill: possible bank raising works, construction compounds and access
Nuneaton and Bedworth Borough Council / Warwickshire County Council	2*	Coventry Canal, Yaxley Lane, Nuneaton to Hawkesbury: possible bank raising works, construction compounds and access, Hawkesbury pumping station and lock bypass works
Coventry City Council	2*	Oxford Canal, Hawkesbury to Sowe Common, Coventry: possible bank raising works, construction compounds and access, and bridge modification works
Rugby Borough Council / Warwickshire County Council	2*	Oxford Canal, Ansty to Hillmorton, Rugby: possible bank raising works, construction compounds and access, and bridge modification works, Hillmorton pumping station and lock bypass works
West Northamptonshire Council	2*	Grand Union Canal, Braunston to Cosgrove: Braunston pumping station and lock bypass works, construction compounds and access, possible bank raising works, gravity bypasses (Whilton Locks, Stoke Bruerne Locks, and Cosgrove Lock), bridge modification works
	3	Daventry and Drayton Reservoirs
Milton Keynes City Council	2*	Grand Union Canal, Fenny Stratford: Fenny Stratford pumping station and lock bypass works, construction compounds and access
	4	Pipeline to an underground storage reservoir near Luton (SP2 route option)

Local Authority	Part of the Proposed Development	Elements
Buckinghamshire Council	2*	Grand Union Canal, Stoke Hammond: Stoke Hammond, Three Locks, Grove Lock and Church Lock pumping stations and lock bypass works, construction compounds and access
	4	Abstraction, Storage and Treatment (Sites B and H) Pipeline to an underground storage reservoir near Luton (SP2A, SP5 and SP6 route options)
Central Bedfordshire Council	2*	Grand Union Canal, Leighton Buzzard: Leighton Buzzard pumping station and lock bypass works, construction compounds and access
	4	Pipeline to an underground storage reservoir near Luton (all route options)

** Additional canal works may be required (such as stop locks), however, the location and extent of these works is yet to be determined. Any additional works will be confirmed within the ES.*

3.4 Description of the Site and Surrounding Area

Part 1: Minworth to Atherstone

Part 1a: Minworth AWTP

- 3.4.1 The EIA Scoping Boundary for the Minworth AWTP (Part 1a of the Proposed Development) is located to the north-east of Birmingham with the Royal Town of Sutton Coldfield. The total area of the EIA Scoping Boundary for Minworth AWTP is 29.17 hectares (ha). An environmental constraints plan for Part 1a of the Proposed Development is included within **Figure 3-1** in Volume 2 of this EIA Scoping Report.
- 3.4.2 The Part 1a EIA Scoping Boundary is principally located on land to the south-east of the existing Minworth Wastewater Recycling Centre (WwRC) known as Curdworth Beds, an area of former sewage sludge beds. Some of the proposed works are within the boundary of the existing WwRC. The EIA Scoping Boundary largely comprises vacant, open ground, surfaced with grass, low-lying scrub vegetation and immature trees that have emerged from former sludge beds. The existing WwRC treats wastewater from an equivalent population of 2.5 million people. From the west, the EIA Scoping Boundary is bound by an area of the existing Minworth WwRC which is registered as a hazardous landfill site.
- 3.4.3 Immediately to the north of the Part 1a EIA Scoping Boundary is the village of Curdworth. To the east are the M42 and M6 Toll Road. To the south, the

EIA Scoping Boundary is bound by a field drain and a railway line. The River Tame is located approximately 190 m to the south of the EIA Scoping Boundary from its closest point. Access to the Minworth AWTP EIA Scoping Boundary is via a proposed new access from the A4097 Kingsbury Road and along the eastern boundary of the WwRC.

- 3.4.4 The Minworth AWTP is located within Birmingham City Council's Air Quality Management Area (AQMA), declared for exceedances of nitrogen dioxide and particulate matter (PM₁₀) air quality limit values. The Part 1a EIA Scoping Boundary is also located within an area designated by Birmingham City Council as Green Belt and partially within a Site of Importance for Nature Conservation (SINC).
- 3.4.5 The closest statutory designated heritage asset is the Grade II listed Minworth Greaves Farmhouse immediately opposite the access from the A4097 Kingsbury Road. In addition, there are clusters of listed buildings within the adjacent Cudworth village to the north-east and within the village of Water Orton to the south.
- 3.4.6 Parts of the EIA Scoping Boundary are located within Flood Zones 2 and 3 due to the potential for flooding from the River Tame. Albeit parts of the Part 1a EIA Scoping Boundary are also considered to benefit from existing flood defences.

Part 1b: Minworth to Atherstone Pipeline

- 3.4.7 The Part 1b EIA Scoping Boundary for the Minworth to Atherstone Pipeline (Part 1b of the Proposed Development) connects the Minworth AWTP to Coventry Canal in Atherstone. The total length of the pipeline route is approximately 16 km and the total area of the Part 1b EIA Scoping Boundary is 310.23 ha. The Part 1b EIA Scoping Boundary is typically 200 m wide, whilst the final pipeline corridor is likely to comprise a 50 m working width. Environmental constraints plans for Part 1b of the Proposed Development are included within **Figure 3-1** in Volume 2 of this EIA Scoping Report.
- 3.4.8 Starting from the Minworth AWTP, the Part 1b EIA Scoping Boundary passes through areas of agricultural land until the pipeline corridor reaches south of Baxterley, where a Break Pressure Tank is proposed. From then onwards, the Part 1b EIA Scoping Boundary follows the local road network (within or adjoining Twenty One Oaks Road and Coleshill Road). Two options remain for connecting the pipeline to Coventry Canal at Atherstone, as shown on **Figure 3-5** within Volume 2 of this EIA Scoping Report. Option 1 is a route from Coleshill Road across a section of Atherstone Golf Course, to meet the canal outside of the town. Option 2 would continue along Coleshill Road to meet the canal where it crosses the road.
- 3.4.9 The surrounding landscape largely comprises agricultural fields bound by hedgerows and hedgerow trees. The main settlements along the route include Lea Marston, Whitacre Heath, Hurley and Baxterley, prior to Part 1b joining the Coventry Canal in Atherstone.
- 3.4.10 To the east of Baxterley, the Part 1b EIA Scoping Boundary follows Coleshill Road immediately adjacent to areas of ancient woodland and the Grade II*

listed Merevale Hall Registered Park and Garden, which also includes the Grade II listed Beehive Cottage. There are a number of further listed buildings within the area surrounding Part 1b, with the Grade II Hurley and Wood End War Memorial being immediately adjacent to the EIA Scoping Boundary to the north-east of Hurley.

3.4.11 The Part 1b EIA Scoping Boundary crosses the following key features:

- a. M42/M6 Toll road;
- b. Area safeguarded for HS2;
- c. A446;
- d. River Tame and Dog Lane Brook main rivers;
- e. Two railway lines;
- f. B4098;
- g. B4116; and
- h. Other minor roads and ordinary watercourses.

3.4.12 Sections of the Part 1b EIA Scoping Boundary crossing the River Tame and Dog Lane Brook are located within Flood Zones 2 and 3 associated with these rivers. Parts of the Part 1b EIA Scoping Boundary also cross the Land West of Hams Lane, CEGB Site No 2 near Lea Marston, Birmingham Road, Cotton Hall Quarry and Outwoods Golf Club historic landfill sites.

3.4.13 The majority of the Part 1b EIA Scoping Boundary lies within an area of Green Belt designated by the North Warwickshire Borough Council, this extends until just to the east of Hipsley Lane.

3.4.14 The closest statutory designated sites for nature conservation include the Whitacre Heath Site of Special Scientific Interest (SSSI), located immediately to the south of the Part 1b EIA Scoping Boundary adjacent to Lea Marston, and the Bentley Park Wood SSSI to the south of Part 1b EIA Scoping Boundary adjacent to Merevale Lake.

Part 2: Outfall and other works to the Coventry, Oxford and Grand Union Canals

3.4.15 Part 2 of the Proposed Development comprises works to the Coventry, Oxford, and Grand Union Canals. Part 2 spans nine local authorities, starting in Atherstone, North Warwickshire, and continues approximately 135 km south, ending in Central Bedfordshire. If Site B is selected as the location for storage and treatment then a shorter length of canal would be required (approximately 115 km). The total area of the Part 2 EIA Scoping Boundary is approximately 678.57 ha. Environmental constraints plans for Part 2 of the Proposed Development are included within **Figure 3-2** in Volume 2 of this EIA Scoping Report. The subsequent section of the site description relates to the Indicative Work Area of Part 2, as explained within paragraph 3.2.4 of this chapter, where physical works associated with the Proposed Development may take place.

- 3.4.16 Commencing in Atherstone, the Indicative Work Area of Part 2 proceeds through predominantly rural landscape until it reaches Nuneaton. The Indicative Work Area continues through Nuneaton, predominantly through housing estates, crossing the A444 following which no physical works are proposed beyond this location within the EIA Scoping Boundary. The Indicative Work Area recommences at Hawkesbury, where the Coventry Canal joins the Oxford Canal, and the Part 2 EIA Scoping Boundary follows the Oxford Canal thereafter.
- 3.4.17 Along the Oxford Canal, the Indicative Work Area of Part 2 continues in parallel with the M6 until it crosses the M69 at Ansty and then continues south through predominantly agricultural land across the M6 towards Rugby. The Indicative Work Area ends where the canal network passes north of Rugby and recommences at Hillmorton. The Indicative Work Area then continues south crossing a railway line and the A428 and ends, as it reaches the B4038 to the south-east of Hillmorton.
- 3.4.18 At Braunston, the Indicative Work Area begins again along the Grand Union Canal and continues towards the Daventry and Drayton Reservoirs passing under the A361 and the A5, heading south at Long Buckby Wharf across rural and agricultural land and passing under the A5 again and the A45 towards Weedon Bec. The Indicative Work Area then continues east passing small urban settlements before passing under the A43 and heading south to Blisworth where the Indicative Work Area ends.
- 3.4.19 The Indicative Work Area subsequently includes sections of the Grand Union Canal at Stoke Bruerne, Cosgrove, Fenny Stratford, Stoke Hammond, and within and to the south of Leighton Buzzard, where the Part 2 EIA Scoping Boundary ends.
- 3.4.20 A towpath runs along the entire section of the canal network within the project scope. In addition, there are a number of marinas, moorings, locks, tunnels and bridges along the route. Larger settlements along the route include Atherstone, Nuneaton, Bedworth, Coventry, Rugby, Daventry, Milton Keynes, Bletchley, and Leighton Buzzard.
- 3.4.21 The Part 2 Indicative Work Area cross the Coventry and Rugby AQMAs, both declared due to high levels of nitrogen dioxide.
- 3.4.22 There are 18 historic landfill sites within the Part 2 Indicative Work Area, as listed within **Chapter 21: Materials and Waste** of this EIA Scoping Report. In addition, there are a number of further historic landfill sites immediately adjacent to the Part 2 Indicative Work Area. There is one authorised landfill site, Judkins Landfill Phase 3, north of Nuneaton, within the Indicative Work Area and several other authorised landfill sites in close proximity to the Part 2 Indicative Work Area.
- 3.4.23 There are no statutory designated sites for nature conservation within the Part 2 Indicative Work Areas and only one small area of ancient woodland borders the Indicative Work Area near Hungerfield. Further information on sites designated for nature conservation is provided within **Chapter 13: Ecology – Terrestrial** of this EIA Scoping Report.

- 3.4.24 There are a number of Grade II listed structures within the Part 2 Indicative Work Area, including listed locks and bridges. There are also a large number of listed buildings within the vicinity of the Part 2 Indicative Work Area. Hawkesbury Junction and the Grand Union and Oxford Canals, between Hillmorton and Cosgrove, are within Conservation Areas. There are several other Conservation Areas within the surrounding areas. Further information on heritage assets is provided within **Chapter 11: Cultural Heritage** of this EIA Scoping Report.
- 3.4.25 The section of Part 2 of the Proposed Development between Hawkesbury and Newbold on Avon and the area surrounding the proposed Leighton Pumping Station are within areas of Green Belt.
- 3.4.26 Sections of the Part 2 Indicative Work Area also fall within areas of Flood Zones 2 and 3 associated with fluvial flooding from the numerous main rivers that the route crosses, as shown on **Figure 3-2** in Volume 2 of this EIA Scoping Report.

Part 3: Daventry and Drayton Reservoirs

- 3.4.27 Part 3 of the Proposed Development comprises the existing Daventry and Drayton Reservoirs, with a total area of approximately 157.47 ha. An environmental constraints plan for Part 3 of the Proposed Development is included within **Figure 3-2** in Volume 2 of this EIA Scoping Report.
- 3.4.28 Daventry Reservoir is located to the east of Daventry between Daventry and Norton, in Northamptonshire. The reservoir lies within the Daventry Country Park Local Nature Reserve (LNR) and is surrounded by green space which forms the Daventry Country Park. The Country Park is also designated as a Conservation Area. Play space and forested areas can be found to the west of the reservoir, with the A425 and a residential housing estate running parallel to this. A large forested area is located to the south with agricultural fields to the north and east of the reservoir. The reservoir also has a sailing club.
- 3.4.29 Drayton Reservoir is located to the north to Daventry, north-east of Daventry Reservoir. It is a managed fishing reservoir. The A361 runs parallel to the northern edge of the reservoir. Lang Farm Northern Valley Park and residential housing estates are situated on the other side of the A361. To the east and west of Drayton Reservoir are residential housing estates and to the south, there is an industrial business park.
- 3.4.30 Daventry Reservoir and Drayton Reservoir currently operate as canal supply reservoirs for the Grand Union Canal and have done since they were first opened in 1796 and 1804 respectively. They are owned and operated by the Trust.
- 3.4.31 The Daventry Sewage Works historic landfill site is located within the Part 3 EIA Scoping Boundary of the Daventry Reservoir. In addition, a small section of the Part 3 EIA Scoping Boundary north of the Daventry Reservoir is within Flood Zones 2 and 3 for fluvial flooding.

Part 4: Abstraction, Storage and Treatment and Pipeline to an Underground Reservoir near Luton

Part 4a: Abstraction, Storage and Treatment

3.4.32 The Part 4a EIA Scoping Boundary includes two options for the abstraction, storage and treatment site, both of which are located within the administrative boundary of Buckinghamshire Council:

- a. Site B: south of Milton Keynes near Bletchley; and
- b. Site H: south of Leighton Buzzard near the village of Slapton.

3.4.33 The sites for both of these options are further described below. An environmental constraints plan, including both of these sites, is included within **Figure 3-3** in Volume 2 of this EIA Scoping Report.

Site B

3.4.34 Site B covers an area of approximately 46.73 ha. The existing site mainly comprises low-quality grassland habitats and arable fields with hedgerow boundaries. The site is bound by the A4146 to the north and Galley Lane to the east. It is surrounded by agricultural land and farm buildings, with a small area of woodland located just outside the Part 4a EIA Scoping Boundary to the east. In addition, a small number of residential properties are located just outside the Part 4a EIA Scoping Boundary to the north-east, and the residential area of Water Eaton, Bletchley is located approximately 100 m to the west.

3.4.35 River Ouzel crosses the western section of Site B and a tributary to River Ouzel bisects the site. Parts of Site B are located within Flood Zones 2 and 3 associated with the River Ouzel floodplain.

3.4.36 There are no statutory designated sites for nature conservation or historic environment within the EIA Scoping Boundary or within its immediate vicinity. However, the non-statutory Waterhall Park Local Wildlife Site (LWS) is located approximately 25 m to the north of the Part 4a EIA Scoping Boundary on the other side of the A4146.

Site H

3.4.37 Site H covers an area of approximately 42.3 ha. The existing site mainly comprises open agricultural land intersected and bordered by hedgerows and a relatively recent woodland plantation. Site H also includes the non-statutory Green Lane LWS, which is considered important for its hedges and ditches. There are two Public Rights of Way (PRoW) which cross the site.

3.4.38 Site H is located immediately west of Slapton, with closest residential properties within approximately 35 m of the Part 4a EIA Scoping Boundary. Access to Site H is provided by Horton Road at its south-eastern end. The surrounding areas to the north, west and south of Site H are predominantly agricultural.

- 3.4.39 A watercourse runs in parallel to the western boundary of Site H, with small areas of Flood Zones 2 and 3 associated with this watercourse also extending into the Part 4a EIA Scoping Boundary.
- 3.4.40 There are no statutory designated sites for nature conservation or historic environment within the Part 4a EIA Scoping Boundary or within its immediate vicinity.

Part 4b: Pipeline to an Underground Reservoir near Luton

- 3.4.41 A number of pipeline route options remain within the Part 4b EIA Scoping Boundary from Sites B and H to the existing underground reservoir near Luton. These options are summarised within **Table 3-2** and the Part 4b EIA Scoping Boundaries for these options are shown on **Figure 3-3** in Volume 2 of this EIA Scoping Report.

Table 3-2: Part 4b Pipeline Route Options

Part 4a Option	Part 4b Pipeline Option	Common Part 4b Pipeline Options
Site B	SP2, SP2A, SP2B	SP10, SP10A, SP10B, SP10C
Site H	SP5, SP6, SP7	

- 3.4.42 Site B would require the implementation of pipeline route option SP2 for which two alternative pipeline route alignments SP2A and SP2B have also been identified. Site H would require the implementation of either pipeline route option SP5 or a combination of pipeline route options SP6 and SP7. Pipeline route option SP10, and/or its variations SP10A, SP10B and SP10C, would be implemented regardless of which abstraction, storage and treatment site is selected.
- 3.4.43 The Part 4b EIA Scoping Boundary for the pipeline route option corridors is 200 m wide, whilst the final pipeline corridor is likely to comprise a 50 m working width. The corridors predominantly cross agricultural land and avoid larger settlements. The corridors have been routed to avoid sites designated for nature conservation and historic environment, where possible. However, where the corridors encroach into existing designations, the proposed 50 m wide working area would be located to avoid existing environmental features and constraints, where possible. The common sections of the Part 4b pipeline (i.e. SP10, SP10A, SP10B, and SP10C options) cross the Chiltern Hills National Landscape, which is unavoidable, as moving the pipeline outside it is heavily constrained by the existing built-up areas of Dunstable. A summary of where the pipeline route options encroach into or cross existing designations is presented within **Table 3-3**.

Table 3-3: Part 4b Pipeline Route Options – Designated sites and constraints within the EIA Scoping Boundary

Part 4b Options	Sites Designated for Nature Conservation	Sites Designated for Historic Environment	Other designations or constraints
SP2	Clipstone Brook CWS	Little Brickhill Conservation Area	Sand Quarry historic landfill site Flood Zones 2 and 3
SP2A	Bragenham Wood Ancient Woodland King's Wood and Rushmere National Nature Reserve / Kings and Bakers Wood and Heaths SSSI and County Wildlife Site (CWS) Great Brickhill Field LWS	Great Brickhill Conservation Area Grade II Listed Middle Lodges Southern Lodge Grade II Listed Church Farmhouse	Fox and Hounds Sandpit historic landfill site
SP2B	Clipstone Brook CWS	Grade II Listed Battlesden Park Registered Park and Garden Grade II Listed remains of gates, gatepiers and walls at Battlesden Lodge Grade II Listed Battlesden Lodge	Flood Zones 2 and 3
SP5	River Ouzel CWS	Butler's Manor moated site Scheduled Monument	Flood Zones 2 and 3
SP6	River Ouzel CWS	None	Flood Zones 2 and 3
SP7	None	None	Flood Zones 2 and 3
SP10	Kensworth Chalk Pit SSSI Cottage Bottom Fields Local Nature Reserve Badgerdell Wood Ancient Woodland / CWS	None	Shepherds Farm historic landfill site Flood Zones 2 and 3 Chiltern Hills National Landscape

Part 4b Options	Sites Designated for Nature Conservation	Sites Designated for Historic Environment	Other designations or constraints
SP10A	Dunstable and Whipsnade Downs SSSI / CWS Unnamed Ancient & Semi-Natural Woodland	Grade II listed Robertson War Memorial Bequest Obelisk, Robertson Corner	Chiltern Hills National Landscape
SP10B	None	None	Chiltern Hills National Landscape
SP10C	Badgerdell Wood Ancient Woodland / CWS	None	Chiltern Hills National Landscape

3.5 Description of the Proposed Development

The Rochdale Envelope

- 3.5.1 The Planning Inspectorate's (PINS) Advice Note 9: Using the 'Rochdale Envelope' ('Advice Note 9') (Ref. 2) provides guidance regarding the degree of flexibility that may be considered appropriate within an application for development consent under the Planning Act 2008 (Ref. 3). The advice note acknowledges that there may be aspects of the Proposed Development design that are not yet fixed, and therefore, it will be necessary for the EIA to assess likely 'worst-case' parameters to ensure that all foreseeable significant environmental effects of the Proposed Development are assessed. Paragraph 4.9 of Advice Note 9 states:

"If, in the course of preparing an ES, it becomes clear that it will not be possible to specify all the details of the Proposed Development, the ES [Environmental Statement] must explain why and how this has been addressed. The ES will need to establish the relevant parameters for the purposes of the assessment. Where this approach is adopted the assessments in the ES should be undertaken on the basis of the relevant design parameters applicable to the characteristics of the Proposed Development included within the DCO. The assessment should establish those parameters likely to result in the maximum adverse effect (the worst case scenario) and be undertaken accordingly to determine significance."

- 3.5.2 It is necessary that there is some flexibility built into the design of the Proposed Development when submitting the DCO application, in order that the detailed design of the Proposed Development can be informed by environmental and technical considerations, post-consent work and take advantage of innovation in technology. Where such flexibility or optionality is currently known, this is explained in sections below.
- 3.5.3 It is therefore necessary for the technical assessments to assess an 'envelope' within which the works will take place. As such, the application

and EIA will be based on maximum and, if relevant, minimum parameters. To remain in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations') (Ref. 4), it will be essential that the parameters are as 'limited' as possible to ensure that the 'likely significant effects' are identified, rather than unrealistically amplified effects, which could be deemed to be unlikely. These parameters will be set out in each technical chapter of the ES, to ensure the realistic worst-case effects of the Proposed Development are assessed for each topic area.

- 3.5.4 The subsequent sections of this chapter provide a description of the Proposed Development within each part and, where known, set out the maximum parameters that will be confirmed and refined within the ES.

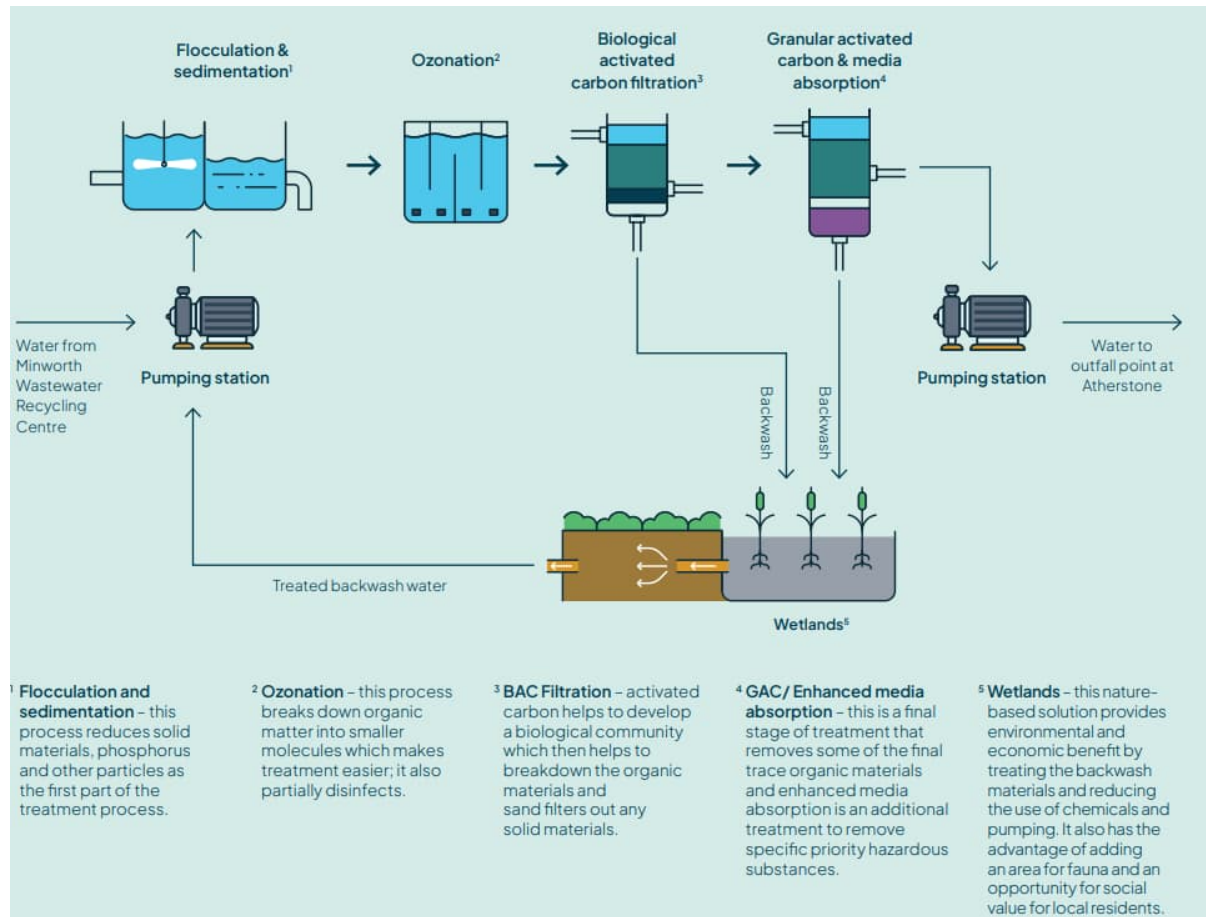
Part 1a: Minworth AWTP

Summary

- 3.5.5 Part 1a Minworth AWTP includes the construction, operation and maintenance of the following buildings and infrastructure:
- a. Influent Pumping Station;
 - b. Flocculation and Sedimentation Units;
 - c. Filter Building;
 - d. New wetland areas, if selected as a treatment option;
 - e. Electrical buildings and kiosks for new power supply;
 - f. Other associated above and below ground works, including pipework and landscaping;
 - g. Access roads and car parking; and
 - h. Temporary construction working areas and compounds.
- 3.5.6 An indicative layout plan for Minworth AWTP is included within **Figure 3-4** in Volume 2 of the EIA Scoping Report. The maximum height of buildings above ground is expected to be up to 15 m for the main AWTP filter building.
- 3.5.7 The Minworth AWTP will receive recycled water from the Minworth WwRC that would have otherwise been discharged to the River Tame and will further treat it. The AWTP will be designed to treat bulk organics, nutrients, and priority contaminants. An activated carbon-based treatment train has been proposed with the following key process units: Flocculation and sedimentation followed by ozone oxidation, Biological Activated Carbon (BAC) filtration, and hybrid Granular Activated Carbon (GAC) and enhanced adsorption media. The BAC and GAC filters will be backwashed when they show that the media has become clogged and exhibit higher 'head loss' than designed for. There is an option for backwash water to be transferred to a new wetland area, which would be created by the Proposed Development adjacent to the AWTP, to settle out the solids in the backwash water before it is returned to the inlet of the AWTP for treatment. The flow exiting the wetland would be recirculated back to the inlet of the AWTP. A process

diagram for the treatment train of the recycled water is provided within **Plate 3-1** below.

Plate 3-1: Process diagram for water treatment at Minworth AWTP⁴



3.5.8 Alternatively, if the wetlands option is not used, the backwash water would be returned directly to the Minworth WwRC via the Proposed Development's returns pumping station.

3.5.9 The final pumping station discharging into the Part 1b pipeline will be designed, so that the pumping of water can be stopped at any point, if there are any issues and the quality of treated water drops below the required standards. In this scenario, the water will be returned to the treatment plant and retreated.

Construction Methodology

3.5.10 New buried pipework is to be installed and existing pipework diverted, including the installation of a new inlet pipe to the AWTP from the existing Minworth WwRC. Using an excavator, a trench will be dug out and pipe lengths lowered into it, where they will be welded together. Deep excavations, where the slope cannot be battered back will require additional

⁴ If the wetlands option is not used, the backwash water would be returned directly to Minworth WwRC via the Proposed Development's returns pumping station.

support in the form of sheet piles or trench boxes. A sheet pile cofferdam, installed using a leader rig or excavator mounted piling attachment, is required within the existing effluent channel of Minworth WwRC to allow for construction of the new inlet, this may require over pumping of the effluent channel to maintain flows necessary for the operation of the existing treatment works.

- 3.5.11 The backwash water will be returned to the Minworth WwRC via the returns pumping station for processing via an approximately 1 km long pipeline. This pipe would be laid at ground level to assist with installation and reduce the associated construction risk of breaking ground. To maintain a constant elevation, pipe supports may be required to accommodate the existing ground profile. Pipe sections will require lifting during the installation process, prior to them being welded together, which will be undertaken by either a telehandler or excavator.
- 3.5.12 The structure of the AWTP will mainly consist of off-site fabricated components with minimal site connections and site preparation works. Larger components will be brought to site either partially or fully assembled and lifted into position or cast in-situ as required. Pipework will then be installed to connect the process units together. The process units will need to be installed on reinforced concrete foundations. These will require local excavation to facilitate reinforcement fixing and shuttering. Concrete will be brought to site in ready-mix wagons and discharged directly into the formwork or placed using a mobile concrete pump. Any structures that are to be buried at depth will require a sheet pile retaining structure, installed using a leader rig or excavator mounted piling hammer, with a cast *in situ* concrete lining.

Operational Considerations

Operational Noise

- 3.5.13 The main potential source of operational noise at the AWTP are the pumping stations within the AWTP, which will be designed to limit the operating noise in line with relevant standards.
- 3.5.14 Measures will be included in the design where required to control the noise from the facility, such as acoustic enclosures, screens, lagging, attenuators and silencers to suit operational and environmental needs. These measures will be developed as the Proposed Development progresses with further design and assessment.

Operational Emissions to Air

- 3.5.15 There will be no emissions to air, which would require an Environmental Permit (e.g. from flues).

Operational Waste

- 3.5.16 The sludge produced by the AWTP processes will be sent back to the main Minworth WwRC inlet via the Proposed Development's returns pumping station as will any backwash water. Estimated quantities of other operational wastes will be set out within the ES.

Operational Employees

- 3.5.17 It is expected that the AWTP will be staffed 24/7 with three 8-hour shifts per day. It is expected that 11 Full-Time Equivalent (FTE) employees will be required. This will be confirmed in the ES.

Operational Traffic

- 3.5.18 Operational traffic estimates will be set out within the ES. This will include traffic movements associated with operational staff travel and deliveries to / from Minworth AWTP.

Part 1b: The Minworth to Atherstone Pipeline

Summary

- 3.5.19 Part 1b of the Proposed Development comprises transfer of water through a new 16 km long pipeline from the Minworth AWTP to an outfall on the Coventry Canal at Atherstone. The pipeline will have the capacity to transfer the maximum of 115 Ml/d of water from the Minworth AWTP. Part 1b includes the construction, operation and maintenance of the following infrastructure:
- a. Pipeline to transfer water;
 - b. A Break Pressure Tank (BPT) in a building;
 - c. Works to facilitate temporary and permanent access;
 - d. Temporary construction working areas and compounds; and
 - e. Other associated above and below ground works relating to the pipeline.
- 3.5.20 **Figure 3-5** within Volume 2 of this EIA Scoping Report provides indicative layout plans for Part 1b of the Proposed Development.

Pipeline

- 3.5.21 Water in the pipeline will be pumped to a high point approximately 15 km from Minworth at a site near Baxterley. This is where the level-controlled BPT will be located. Beyond the BPT, water in the pipeline will flow by gravity down to the discharge point on the Coventry Canal.
- 3.5.22 The Part 1b EIA Scoping Boundary for the pipeline is shown on **Figure 3-5** within Volume 2 of this EIA Scoping Report. It provides the widest possible area within which the pipeline could be routed and is typically around 200 m wide. A wide corridor has been identified at this stage, to enable further routing around constraints and for consultation feedback to be taken into account, following further design development. The final pipeline corridor is likely to comprise a 50 m working width in total for the pipeline, associated compounds and access, and the BPT.
- 3.5.23 The maximum and minimum depths for the pipeline are expected to be as follows:
- a. Likely minimum pipe depth of 1.2 m to the top of the pipe; and

- b. Likely maximum pipe depth of approximately 9.5 m to the top of the pipe at the major crossings, subject to refinement following further design development.
- 3.5.24 Final maximum and minimum depths will be confirmed in the ES and the DCO application.
- 3.5.25 The pipeline is expected to have an internal diameter of approximately 1,000 millimetres (mm) and at this stage, it is expected to be made from steel and have internal and external protective coatings. In addition, works may be required for the installation of pipeline markers, air valves and washout chambers, cathodic protection, site reinstatement, habitat establishment and landscaping.

Break Pressure Tank

- 3.5.26 The BPT is required to manage the water pressures that will be generated in the pumped rising main section and the transition from a pumped flow to a gravity flow within the pipeline. The BPT is also used to ensure that a surge from the starting and stopping of the pumps at the AWTP does not affect the pipeline.
- 3.5.27 The BPT is likely to comprise a partially buried pre-cast concrete tank, with additional chambers, hardstanding areas and security fencing. An emergency overflow pipe will discharge to a nearby brook from the BPT. Access to the BPT will be via the public highway and a dedicated new access road connecting to Twenty One Oaks Road.

Construction Methodology

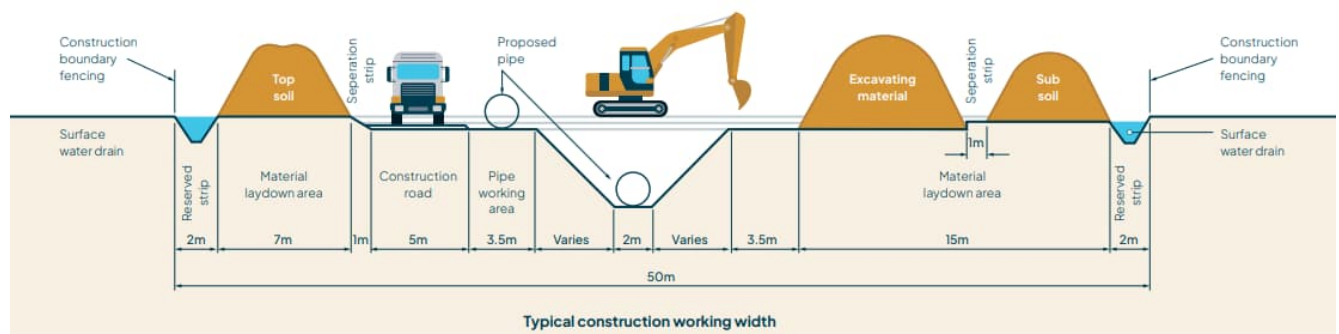
Pipeline

- 3.5.28 The majority of the pipeline will be installed using open cut methods in open greenfield sites, following the establishment of the construction site. The following works will occur simultaneously in a staggered sequence, so only a short length of excavation will be open at any one time.
 - a. Trench Excavation – Excavators will be used to dig out the trench to a suitable depth and width. The sides of the excavation will be battered back to a suitable angle and excavated material will be stockpiled to the side of the trench. A haul road will provide access for plant and vehicles along the length of the working corridor. In locations where the working area is constrained, temporary works, such as sheet piles or trench boxes may be needed to support the sides of the excavation;
 - b. Pipeline Installation – Using an excavator or small crane, lengths of pipe will be lifted into position at the bottom of the trench. Where possible, pipe lengths will be welded together at the side of the trench before being lifted into place, otherwise they will be welded together in-situ; and
 - c. Trench Backfill and Reinstatement – Once the pipe is installed and tested, excavators will be used to place suitable bedding material around it. The trench will then be backfilled using the stockpiled

material and any temporary works used to support the excavation will be removed. Any excess or unsuitable material will be loaded into Heavy Goods Vehicles (HGV) and removed for disposal on or off site. The backfilled area would then be reinstated to its previous use, with any vegetation reinstatement undertaken during the next planting season.

3.5.29 An indicative pipe laying arrangement is shown in **Plate 3-2** below.

Plate 3-2: Indicative Cross Section of Pipeline



3.5.30 Where obstacles, such as major roads, rivers and railways prevent the use of open cut methods, the design proposes to utilise trenchless techniques to install the new pipeline, which may include pipe jacking or horizontal directional drilling techniques.

3.5.31 The pipeline navigates several major crossings as shown on **Figure 3-5** within Volume 2 of the EIA Scoping Report and listed in **Table 3-4** below.

Table 3-4: Part 1b Minworth to Atherstone – List of major crossings

Crossing No.	Location	Crossing
1	M6/M42, South of Dunton Interchange	M6/M42
2	Lichfield Road / A446, North of Hams Hall Roundabout	A446
3	West of Hams Hall Substation	HS2
4	North of Lea Marston	River Tame / Local Wildlife Site / Railway
5	North of Lea Marston	Lea Marston Historic Landfill
6	North of Whitacre Heath	Railway
7	South-east of Baxterley	B4116/ Bentley Common / Twenty One Oaks Road

3.5.32 Access points will be constructed at a number of locations to provide access to each of the work areas and routes for construction traffic to these access points from the strategic road network. The likely routes to the indicative

access points are shown on **Figure 3-5** within Volume 2 of the EIA Scoping Report.

BPT Construction

- 3.5.33 The footprint of the BPT will be excavated down to formation. The slopes of the excavation will be battered back and the excavated material will be stockpiled on site using excavators and dumpers.
- 3.5.34 A concrete foundation will be poured over the footprint of the tank, on which rebar and formwork will then be assembled.
- 3.5.35 It is proposed that the tank is constructed from pre-cast concrete panels. These panels will be brought to site on articulated delivery wagons and lifted into position using a medium size mobile crane. Temporary haul roads and working platforms constructed of compacted granular fill will be needed to facilitate this operation.
- 3.5.36 After construction and testing, an excavator would be used to surround the tank with an earth bund, which will be constructed and compacted. It would then be covered with topsoil and seeded with grass.

Part 2: Outfall and other works to the Coventry, Oxford and Grand Union Canals

Summary

- 3.5.37 Part 2 of the Proposed Development comprises works to the Coventry, Oxford and Grand Union canals.
- 3.5.38 Due to its historic nature, the canal network developed over a long period of time since the 1790s and does not have a consistent width, depth or construction detail along its length. The current canal network is an amalgamation of different canals of different ages and dimensions.
- 3.5.39 The canal network has transported people and goods for over two centuries and it is considered to be busier now than ever before. More boats and people are visiting, and living on or by the canals, and the canals are supporting waterway dependent businesses. The canal towpaths bring nature and green and blue space to millions of people up and down the country for leisure and recreation. The canal network also accommodates residential moorings and marinas, which will be considered within the EIA as sensitive receptors.
- 3.5.40 Although as a result of the Proposed Development, additional water will be transferred into the canal network, the flow of water running through the canals will be managed to not increase noticeably. Water velocity through structures would be maintained at or below a maximum of 0.3 m per second and the flow range would be below the maximum speed for the majority of the time. Improvement works are proposed along the canal network to ensure flow speeds do not exceed the maximum. The maximum flow speed is required for the safe navigation on the canals.
- 3.5.41 Part 2 of the Proposed Development will therefore comprise:

- a. An outfall structure at Atherstone to control the discharge of the recycled water transferred from the Minworth AWTP;
- b. Construction of pumped and gravity bypasses to bypass locks, as not all locks and bypass weirs will be able to pass maximum transfer flows while maintaining safe navigation;
- c. Potential modification to some existing canal bridges to ensure safe navigation/headroom clearance, where water levels are predicted to increase during peak transfer;
- d. Raising of sections of canal bank levels to maintain a minimum freeboard (vertical distance from the top of the canal bank to the water surface) – required to prevent potential overtopping, maintain safe moorings and prevent water loss;
- e. An alternative to extended stretches of bank raising may include the construction of a number of stop locks. A stop lock breaks the flow of water and is a way to control the flow and prevent one section of canal taking large amounts of water from another section of canal;
- f. Modification of a number of existing control and waste weirs to prevent water loss and premature discharge to adjacent connected watercourses;
- g. Works to facilitate temporary and permanent access;
- h. Temporary construction working areas and compounds; and
- i. Other associated above and below ground works relating to the canal network (e.g. works to towpaths and to improve local towpath access points, facilities for boaters, such as mooring sites, rings etc., potential works to existing vacant/ surplus canal side buildings / re-use, installation of signage, site reinstatement and habitat establishment, landscaping).

3.5.42 Indicative layout plans for Part 2 of the Proposed Development are provided within **Figure 3-6** in Volume 2 of this EIA Scoping Report.

Atherstone outfall structure

3.5.43 There are two options for the proposed discharge location from Part 1b Minworth to Atherstone pipeline on the Coventry Canal. Under 'Option 1', the outfall is located on the western bank of the canal, on the north-east side of the Atherstone Golf Course. Under 'Option 2', the outfall is located on the western bank of the canal at Atherstone, close to the intersection between Coleshill Road and the canal. The locations of these options are shown on **Figure 3-6** in Volume 2 of this EIA Scoping Report.

3.5.44 The discharge will be via a hydroelectric turbine. The turbine has the dual purpose of reducing the velocity of the discharge and converting this dynamic energy into electricity.

Pumped bypasses

3.5.45 Pumping stations and associated bypass works are required to bypass existing lock structures along the canal to allow the water to flow around the

locks, where it is going 'uphill' along the canal. In addition, stop locks with associated pumping stations are an option to reduce the amount and length of bank raising required and are subject to ongoing modelling, as set out within paragraph 3.5.56.

- 3.5.46 Pumping stations and associated bypass works (including inlet weir, discharge pipeline and outlet weir) may be required at the following locations, as shown on **Figure 3-6** in Volume 2 of this EIA Scoping Report:
- a. Hawkesbury;
 - b. Hillmorton;
 - c. Braunston;
 - d. Fenny Stratford;
 - e. Stoke Hammond;
 - f. Three Locks;
 - g. Leighton;
 - h. Grove Lock; and
 - i. Church Lock.
- 3.5.47 Bypasses at Stoke Hammond, Three Locks, Leighton, Grove Lock and Church Lock would only be required if Site H is selected as the abstraction, storage and treatment site within Part 4 of the Proposed Development.
- 3.5.48 Each pumping station must have the capacity to transfer a maximum flow of 115 Ml/d during peak periods, but also must be able to facilitate transfers as low as 15 Ml/d. The process for operating the pumping stations and associated bypasses includes the following:
- a. Water enters a weir, known as an inlet. This helps maintain water levels downstream in the canal, diverting water safely into a pump chamber;
 - b. Pumps will adjust their strength to match the level of incoming flow;
 - c. Water will enter an underground pipeline (typically 700 mm in diameter) and will travel from the pumping station adjacent to the canal uphill around a lock, before it re-enters the canal; and
 - d. Water is put back into the canal at a weir outlet. This will limit the turbulence and speed of the water as it re-enters the canal, to ensure safety of boat users and reducing the risk of sediment disturbance.
- 3.5.49 Where possible, pumping station structures are proposed in the vicinity of the locks in locations that could be accessed via the existing road network. The new pumping stations could be housed in new buildings, or within existing buildings. If a new pumping station building is required, its likely footprint is 7 m by 8 m.
- 3.5.50 The pumping stations would likely be maintained by contracted maintenance staff but operated remotely. They will, therefore, require a degree of

standardisation in terms of their operation and equipment. The design and appearance of the pumping stations will be informed by design principles set for the Proposed Development.

- 3.5.51 **Plate 3-3** includes an illustrative image of an existing pumping station. Due to the potential for locations along the canal to be visually sensitive, designs that limit above ground structures would be preferred and would be investigated further through the EIA process.

Plate 3-3: Example of existing pumping station



Gravity bypasses

- 3.5.52 Gravity bypasses will be required to allow the water to flow downhill past individual locks or lock flights (groups of locks close together). These will be built within the canal bank and will be largely underground to minimise visual impacts.
- 3.5.53 Gravity bypasses are likely to be required at the following locks or lock flights, as shown on **Figure 3-6** in Volume 2 of this EIA Scoping Report:
- a. Whilton Locks;
 - b. Stoke Bruerne Locks; and
 - c. Cosgrove Lock.
- 3.5.54 The process for operating the gravity bypasses includes the following:

- a. Water flows down the canal until it reaches a location, where it needs to flow downhill past a lock or flight of locks;
- b. Water will enter the bypass via a weir structure built into the canal bank, flow through a pipe and bypass the lock, or flight of locks; and
- c. Water re-enters the canal further down, via a similar weir structure to the entry point.

Bridge modifications

- 3.5.55 There are several locations where an existing bridge across the canal has limited clearance between the revised water level, due to the transfer flow, and the soffit of the bridge, some of these may require modification. The need and proposals for any bridge modifications are subject to ongoing modelling and design development and will be confirmed within the ES.

Canal bank raising

- 3.5.56 Sections of the canal that may require bank raising have been identified through hydraulic modelling. **Figure 3-6** in Volume 2 of the EIA Scoping Report shows the indicative sections of the canal which may be subject to bank raising. Bank raising may also be required in adjacent marinas. The nature and extent of modifications to the canal is the subject of ongoing modelling. In addition, stop locks with associated pumping stations are an option to reduce the amount and length of bank raising required, subject to ongoing modelling.
- 3.5.57 Canal bank raising will be designed to be appropriate to the location and the re-establishment and/or mitigation of any impacts will be informed by the Trust's Towpaths for Everyone Policy (Ref. 5).
- 3.5.58 The technique used to raise the level of the canal bank to cope with increased water levels would depend on the following factors:
- a. Existing canal edge detail (e.g. sheet pile, brick edging, grass bank);
 - b. Towpath or non-towpath side;
 - c. Location (e.g. rural, urban);
 - d. Special requirements (e.g. heritage, moorings); and
 - e. Existing canal edge condition (e.g. overgrown, requiring repair).
- 3.5.59 Bank raising would be undertaken on a like-for-like basis with the existing canal bank (i.e. the raised banks would be of same construction as the existing canal bank), and in consultation with the Trust and/or any other relevant landowners.

Modification of control and waste weirs

- 3.5.60 As the Proposed Development will transfer additional water in the canal, control and waste weirs will be used to manage water levels in the canal and remove excess water to surrounding watercourses. It is expected that small improvements and repairs would be required to over 50 existing control and waste weirs.

Construction Methodology

- 3.5.61 Construction methodology for the canal works will be set out within the ES. However, it is anticipated that some works would be undertaken from the bank, whilst others may be from a workboat or a floating platform. Sections of the canal and the towpath may need temporary closure during the proposed works.
- 3.5.62 In addition, mooring sites may require temporary or permanent closure as part of the Proposed Development. During construction, temporary closure of mooring sites as part of the works may be required, while carrying out the works. Where this is needed, lost mooring spaces will be replaced with temporary sites until the original moorings can be re-instated and will be upgraded to improve moorings, where possible. Should permanent relocation of any moorings be required, canal users would be consulted on the best locations for these.

Part 3: Daventry and Drayton Reservoirs

Summary

- 3.5.63 Water resource modelling for the Proposed Development has suggested that there are risks associated with continuous supply from Minworth WwRC during extended droughts. There is a “hands off flow” requirement in the River Trent to which the Minworth WwRC recycled water is a significant contribution via the River Tame, meaning that the transfer of recycled water out of catchment may be stopped in extreme circumstances. A “hands-off flow” is a flow rate at which water abstraction must stop or be reduced. It is a threshold that protects low river flows from abstraction and ensures a minimum flow for in-river ecology.
- 3.5.64 The Daventry and Drayton Reservoirs are proposed to act as a ‘Storage Option’ to support the Proposed Development, whereby the reservoirs can be drawn down to augment the transfer in the Grand Union Canal during periods of high demand, or as dictated by hands-off flows in the River Trent. The reservoirs will also still operate to ensure a supply of water for navigation to the canal.
- 3.5.65 During hands-off flow events, continued transfer from Minworth WwRC to the River Tame may be required to support flows in the River Trent, and therefore the water transfer in the canals will be augmented by transfer from the reservoirs. It is proposed that a semi-continuous transfer from the Grand Union Canal to the reservoirs will be maintained to ensure they are full to provide draw-down support as and when required.
- 3.5.66 This will require a pumping station upstream (north) of the Braunston tunnel, taking water from the Grand Union Canal via a new pipeline to energy dissipating discharge structures at the head of each reservoir. There will also be upgrade works to the outlet channels from each reservoir and upgrades to the discharge structures back into the canal downstream (south) of Braunston tunnel.
- 3.5.67 From the proposed pumping station at Braunston (see section on Pumped Bypasses) the pumped transfer main is split into two pipes. One pipe

(approximately 700 mm) will feed the reservoirs and one pipe (approximately 700 mm) will be used to bypass the reservoirs. The bypass is required to maintain flows during any work to the reservoirs.

- 3.5.68 As for the other pumping stations, there will be flow monitoring and level controls at the intake to the pumping station and monitoring for the delivery into the new pipeline and for delivery from the pipeline into each reservoir at the new discharge structures. There will also be flow monitoring and level sensors at the discharge structures back into the canal.
- 3.5.69 Given the diversion of the canal water into the reservoirs and back out to the canal, and the inevitable mixing of waters in the reservoirs, there will be a need for monitoring water quality and Invasive and Non-Native Species (INNS) at the intake to the pumping station and near the outlet from the reservoirs.

Daventry Reservoir

- 3.5.70 Daventry Reservoir was constructed between 1796 and 1804, for the purpose of supplying water to the Grand Union Canal. The catchment, which is generally low-lying and characterised by very gentle slopes, has an area of 8.43 square kilometres (km²).
- 3.5.71 The proposed inlet location is at the same location as the existing highway drainage discharge structure. The highway discharge structure is a complex of culverts and weirs that overflow into a channel flowing into the reservoir. The proposed new outlet structure would be constructed in the same location as per the existing structure and, in consultation with the highway authorities.

Drayton Reservoir

- 3.5.72 The Drayton Reservoir's impounding structure was completed in 1804 for the purpose of supplying water to the Grand Union Canal. The catchment, which is generally low-lying and characterised by gentle slopes, has an area of 2.06 km². The main feeder rises in Royal Oak industrial estate and is mostly culverted as it passes through the built-up area.
- 3.5.73 The proposed feed pipe (approximately 700 mm diameter) would follow the route of the now disused railway (currently a cycleway) that passes close to the southernmost point of the reservoir. An approximate 450 mm diameter branch will feed the Drayton Reservoir.
- 3.5.74 The existing outlet will be modified to accommodate flows from both the Braunston bypass pipeline and the flows from the reservoir.

Construction Methodology

- 3.5.75 Construction methodology for the reservoir works will be set out within the ES. Albeit the method for the installation of the pipeline is likely to be similar to that described for Part 1b of the Proposed Development.

Part 4a: Abstraction, Storage and Treatment

Summary

- 3.5.76 Part 4a of the Proposed Development comprises the construction, operation and maintenance of the following infrastructure:
- Weir to abstract water from Grand Union Canal;
 - New pumping stations;
 - Open-air water storage;
 - Water treatment works;
 - Electrical buildings and kiosks for new power supply (if required);
 - Clean water storage tank;
 - Other associated above and below ground works, including pipework and landscaping;
 - Access roads and car parking; and
 - Temporary construction working areas and compounds.
- 3.5.77 **Figure 3-7** within Volume 2 of this EIA Scoping Report provides the potential site locations for Part 4a of the Proposed Development.
- 3.5.78 A new weir will be constructed to abstract water out of the Grand Union Canal. The structure would consist of an intake at the canal side to abstract water from the canal in a controlled way and at a low speed. If the abstraction site that is selected affects existing moorings on the canal, these would be relocated. Overall, no moorings would be lost with alternative sites found for any impacted moorings.
- 3.5.79 A pumping station would be constructed to transfer water to the new open-air water storage site. As described for Part 2 of the Proposed Development, a new pumping station building would likely be a single storey building, with a likely footprint of 7 m by 8 m. The design and appearance of the pumping station will be informed by design principles set for the Proposed Development.
- 3.5.80 At the new water storage site, the water abstracted from the canal would be stored before it is treated at the new water treatment works. Storage will be provided for five days' worth of water for peak flow to allow the transfer to be more resilient and allow an additional buffer between water in the canal and the water reaching the new water treatment works. This equates to an estimated 575,000 cubic metres (m³).
- 3.5.81 The water storage is likely to consist of an earth embankment up to a height of around 6 m and a likely surface area of around 11 ha. However, the actual footprint will depend on the topography and features of the site that is selected and further survey and ground investigation works.
- 3.5.82 A new water treatment works will take water from the storage site via a pumping station and treat it to drinking water standards. Further design development will be undertaken to confirm the layout of the new water

treatment works. However, at this stage, it is expected that the entire footprint of the water treatment works will be around 200 m by 100 m. This area will include site buildings, pipelines and storage equipment. The tallest equipment will likely be of a maximum height of 12 m, but most of the equipment will be lower than this. The following stages are being considered for the treatment process, subject to further design development:

- a. Screens and filters;
- b. pH adjustment;
- c. Coagulation and flocculation;
- d. Dissolved air flotation;
- e. Ultrafiltration;
- f. Granular Activated Carbon;
- g. Disinfection using ultraviolet light and sodium hypochlorite dosing; and
- h. pH adjustment and orthophosphoric acid dosing.

3.5.83 Treated water will be stored in an underground clean water storage tank, from which a pumping station will deliver the water into the new potable water pipeline (Part 4b).

Construction and Operational Considerations

3.5.84 The construction methodology and operational considerations described for Part 1a of the Proposed Development are also considered to apply to Part 4a of the Proposed Development. Site-specific methodologies and considerations will be described within the ES.

Part 4b: Pipeline to an Underground Reservoir near Luton

Summary

3.5.85 Part 4b of the Proposed Development comprises the transfer of water from the new water treatment works to an existing covered underground reservoir near Luton via a pipeline. Clean drinking water is subsequently transferred from the underground reservoir near Luton into the AfW water supply network. In summary, Part 4b includes the construction, operation and maintenance of the following infrastructure:

- a. Pipeline to transfer water;
- b. Works to facilitate temporary and permanent access;
- c. Temporary construction working areas and compounds; and
- d. Other associated above and below ground works relating to the pipeline.

3.5.86 **Figure 3-7** within Volume 2 of this EIA Scoping Report provides the route options for Part 4b. The Part 4b EIA Scoping Boundary for the pipeline route options shows the widest possible area within which the pipeline could be routed and is typically around 200 m wide. A wide corridor has been identified at this stage, to enable further routeing around constraints and for

consultation feedback to be taken into account, following further design development. The final pipeline corridor is likely to comprise a 50 m working width in total for the pipeline, associated compounds and access.

- 3.5.87 The pipeline will be of similar construction to the Part 1b of the Proposed Development. It will be approximately one metre in diameter and at this stage, is expected to be made from steel. It will be typically buried to a minimum depth of 1.2 m from the top of the pipe. Further details of the design, including minimum and maximum pipeline depths, will be confirmed within the ES.

Construction Methodology

- 3.5.88 The construction methodology described for Part 1b of the Proposed Development is also considered to apply to Part 4b of the Proposed Development. Site-specific methodologies and considerations will be described within the ES.

3.6 Overarching Construction Information

Construction Programme and Sequencing

- 3.6.1 Subject to being granted consent and following a final investment decision, the earliest that construction of the Proposed Development may start is assumed to be in 2028. Construction and commissioning are estimated to require approximately 4 years, with the earliest that operation may therefore commence being around 2032.
- 3.6.2 The ES will provide further details of the construction activities, their anticipated duration and an indicative programme for each phase of construction work. Furthermore, the ES will confirm the anticipated peak year of construction which will be used to consider effects associated with traffic and transport, air quality and noise and vibration during the construction period.

Construction Staff and Working Hours

- 3.6.3 The ES will provide information on the estimated peak and average construction employment for the Proposed Development and set out the proposed construction working hours.
- 3.6.4 It is anticipated that an Outline Skills, Supply Chain and Employment Plan would be prepared for submission with the DCO application. This will set out the Applicants strategy for maximising and pro-actively expanding the local benefits of the Proposed Development through local employment opportunities and upskilling local workforce.

Overarching Strategies and Management

- 3.6.5 Outline strategies for the management of construction works are proposed to be prepared for submission with the DCO application. These include (but are not limited to):
- a. Outline Code of Construction Practice (CoCP);

- b. Outline Construction Traffic Management Plan (CTMP); and
- c. Outline Landscape and Ecology Management Plan (LEMP) (including reinstatement plans).

Code of Construction Practice

3.6.6 An outline CoCP will accompany the DCO application, which will describe the mitigation measures identified in the ES to be followed and to be carried forward to a Detailed Construction Environmental Management Plan (CEMP) prior to construction. The CoCP describes the commitments that the undertaker and its contractors are obliged to work to. The aim of the CoCP is to reduce impacts from construction activities, including (but not limited to):

- a. Use of land for (e.g.) temporary laydown areas, accommodation;
- b. Vegetation clearance;
- c. Noise and vibration;
- d. Dust generation (through a Dust Management Plan [DMP]);
- e. Soil removal and storage (through a Soil Management Plan [SMP]); and
- f. Waste generation and management (through a Site Waste Management Plan [SWMP]).

3.6.7 The Detailed CEMP will be produced by the appointed construction contractor and agreed with the local planning authorities following grant of the DCO and prior to the start of construction (e.g. under a requirement of the DCO) and will identify the procedures to be adhered to and managed by the Principal Contractor throughout construction.

Outline Construction Traffic Management Plan

3.6.8 An Outline CTMP will be developed and submitted with the DCO application. The Outline CTMP alongside the ES will set out the peak construction vehicle movements per day. The Outline CTMP and ES will also confirm construction access requirements to the different parts of the Proposed Development.

3.6.9 The need for road upgrades, widening and new road construction, e.g. to ensure visibility splays at site access/egress points, will be determined as the Proposed Development design develops, and will be assessed as appropriate.

Outline Landscape and Ecology Management Plan

3.6.10 A programme of site reinstatement and habitat creation will be undertaken. An Outline LEMP will be submitted as part of the DCO application, and this document will set out the principles for how any land will be reinstated, habitats created and managed throughout the operational phase, following the completion of construction. Where possible, options for early planting and habitat creation will be identified.

3.6.11 A detailed LEMP would be produced following grant of the DCO and prior to the start of construction (e.g. as part of a requirement attached to the DCO).

- 3.6.12 In addition to the Outline LEMP, a Biodiversity Net Gain (BNG) Report and Environmental Net Gain (ENG) Report will be produced for submission with the DCO application, as described within **Chapter 7: Other Assessments** of this EIA Scoping Report.

Additional Construction Details

- 3.6.13 The ES will also provide information on the typical construction equipment and material requirements and wastes likely to be generated over the course of the construction period for the Proposed Development.

3.7 Overarching Operational and Maintenance Activities

- 3.7.1 During the operational phase, main activities will be associated with the facilities of Part 1a and Part 4a of the Proposed Development, as described within Section 3.5 of this chapter. Activity along the pipeline routes, canal network and Daventry and Drayton Reservoirs will be minimal and largely restricted to maintenance of equipment.
- 3.7.2 The ES will set out the operational and maintenance activities associated with each part of the Proposed Development. Operational access requirements will be confirmed as the Proposed Development design progresses and in consultation with the relevant authorities.

3.8 Decommissioning

- 3.8.1 Decommissioning of the Proposed Development is not proposed as part of the DCO application, on the basis that the Proposed Development will be operated indefinitely. The need for ongoing maintenance and replacement of the components of the Proposed Development will be considered as part of the operational phase assessment of the EIA. The description of the Proposed Development within the ES will clearly set out the predicted requirements and timescales for dismantling and replacement of any equipment during operation, including the process and methods, and any land use requirements. Where this information is not known, parameters representing a worst-case scenario will be provided. The assessment approach to ongoing maintenance is further explained within **Chapter 6: EIA Approach**.

3.9 References

- Ref. 1 Affinity Water (2024) Water Resources Management Plan October 2024.
- Ref. 2 Planning Inspectorate (2018) Advice Note Nine: Rochdale Envelope, (Version 3), July 2018. Available at:
<https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope> [Accessed 20/03/2025].
- Ref. 3 Planning Act 2008. Available at:
<https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed 20/03/2025].

- Ref. 4 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at:
<https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 20/03/2025].
- Ref. 5 Canal & River Trust (2024) Towpaths for Everyone. January 2024.



Chapter 4: Consideration of Alternatives

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4. Consideration of Alternatives

4.1 Introduction

- 4.1.1 Schedule 4, paragraph 2 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations') (Ref. 1) requires that the Environmental Statement (ES) includes:

"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects".

- 4.1.2 National Policy Statement (NPS) for Water Resources Infrastructure (Ref. 2) states at paragraph 3.5.1 that *"The applicant should comply with the legal obligations and policy set out in the National Policy Statement on the assessment of alternatives..."* including the EIA Regulations and the requirement for *"...projects with significant environmental effects to include a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the project on the environment"*.
- 4.1.3 The NPS goes on to state at paragraph 3.5.2 that *"Information from the water resources management plan options appraisal process (and associated statutory assessments) will be relevant to demonstrate how alternative options have been considered"*.
- 4.1.4 The chapter begins with an explanation of the relationship of the Proposed Development to the Water Resources Management Plan (WRMP) and, Regional Plan processes and how this, and the NPS for Water Resources Infrastructure, establishes the need for the Proposed Development. This is then followed by a description of the role of the Regulatory Alliance for the Progression of Infrastructure Development (RAPID) and the optioneering and evaluation process that has taken place through the RAPID gate reporting stages. The chapter concludes by identifying the matters that are likely to be reported in the Consideration of Alternatives chapter of the ES.

4.2 Water Resource Management Plan and Regional Plan Process

- 4.2.1 Each water company is required to prepare and regularly update a Statutory WRMP which looks ahead over a minimum 25-year period to set out proposals to ensure that customer supplies are secure, taking into account changes to water supply through climate change and environmental legislation and policy, and customer demand, including through planned growth and customer behaviour. WRMP24 is the process of preparing and approving a WRMP for the period 2025 to 2075. Both Severn Trent (ST) and Affinity Water (AfW) have prepared their own WRMP24s. ST published a draft in November 2022 (Ref. 3) with the final version due to be published in

March 2025. AfW published the final version of its plan in October 2024 (Ref. 4).

- 4.2.2 Alongside the WRMP24 process, water companies work together as part of five regional groupings to prepare Regional Plans. These regional groupings enable water companies, environmental and financial regulators and other stakeholders to work collaboratively on shared regional water resource plans. These plans are consistent with and integrate with the WRMPs at individual water company level, and the five regions work together to ensure there is consistency between Regional Plans, particularly over the details of existing and proposed water resource transfers between regions. ST lies within the Water Resources West (WRW) region. AfW's Central and South East regions lie within the Water Resources in the South East (WRSE) region and its East region lies in the Water Resources East (WRE) region. For the Proposed Development, WRW and WRSE are the relevant regions, although WRE will benefit from a new reverse transfer between AfW and Anglian Water. Both WRW and WRSE have prepared and consulted on their Regional Plans for the 2025 to 2075 period, with work progressing in parallel with the WRMP processes. The Draft WRW's Regional Plan (Ref. 5) was published in November 2022 and the Revised Draft WRSE Regional Plan (Ref. 6) was published in August 2023.
- 4.2.3 The GUC Transfer project was first identified as a potential new water resources option as part of the preparatory work for the WRMP and Regional Plan processes.
- 4.2.4 At an early stage in the WRMP and Regional Plan processes, lists of potential water resources options were identified for consideration and assessment. These options included demand management measures such as leakage reduction, water efficiency and drought options (including temporary use bans), supply options including new water resources infrastructure such as desalination plants, water recycling, reservoirs, water transfers within or between water companies or regions, catchment management options and drought supply options such as drought orders or drought permits. Options were initially identified on an unconstrained options list and subject to an initial level of assessment to ensure that they were technically feasible and that they would have a water resources benefit. This resulted in a constrained options list that was then subject to further and more detailed assessment of their feasibility, and which resulted in the identification of a list of feasible options. Those feasible options were then taken forward and considered in depth through preparing and consulting on the WRMP.
- 4.2.5 An option to treat and transfer water through the canal network was first identified as part of the earlier WRMP19 process (for the period 2020 to 2045). In that plan, a number of other strategic and other water resources options were selected as part of the preferred plan based on the assessment work undertaken at that time, and in light of the future supply demand balance challenges presented in that plan. The GUC Transfer Option was selected as the next strategic option for development should one or more of those options not come forward, or if the scale of the supply demand balance were to worsen from that identified in the plan.

- 4.2.6 For the WRMP24, water companies worked collaboratively within regional groupings to ensure that consistent methodologies and data were used for the WRMP and Regional Plan processes, including the identification and assessment of options.
- 4.2.7 The GUC Transfer Project was identified and considered through the WRMP24 and Regional Plan processes as firstly a supply of water from the Minworth WwRC, and secondly its transfer from ST to AfW through pipeline and canal transfer, including its treatment for public water supply. The transfer of water from ST to AfW is also an inter-regional transfer between WRW and WRSE. Extensive liaison and collaboration took place between ST and AfW, and WRW and WRSE, as part of the preparation of the WRMP24s and Regional Plans to ensure that the GUC Transfer Project was consistently represented and assessed through these plan processes.
- 4.2.8 A number of alternative GUC Transfer Options were identified and assessed through the WRMP and Regional Plan processes, informed by technical, environmental and costing information from the RAPID process (described in Section 4.4). This enabled the WRMP and Regional Plan investment modelling to test the scale, phasing and timing of the available GUC Transfer Options. Environmental assessments of the options were also completed. Options included the development of the GUC Transfer Project as two separate phases of 50 MI/d (megalitres a day), or the development of a single 100 MI/d option. Options for Minworth WwRC to solely provide water for the GUC Transfer Project, or additionally to provide water for the potential Severn to Thames Transfer Project were also assessed. As part of the investment modelling undertaken for the WRMP and Regional Plan, the timing of the delivery of the GUC Transfer Project was also considered, with earliest delivery being identified as 2032, but with sensitivity around this date explored to see whether later delivery of the option might result in alternative options being selected in the WRMP and Regional Plan.
- 4.2.9 As an outcome of all of the work summarised above, the GUC Transfer Project was selected as part of the preferred WRMP24 and Regional Plans, as explained in the following paragraphs.
- 4.2.10 The WRSE Regional Plan and AfW WRMP are 'adaptive' plans, which identify a wide range of potential futures based on different combinations of climate change, population growth and environmental policy forecasts. The plans are adaptive as 'least regret' options are selected in the plans, ensuring that the plans and the preferred options within them are adaptable to any of the futures that are forecast to be encountered. Nine potential future pathways are identified in the plans, with the ability for any of the pathways to be followed as the plans adapt. For the purposes of reporting, one is selected as the 'reported pathway'. In the draft WRSE Regional Plan and AfW's draft WRMP (both published in November 2022), a first 50 MI/d phase of the GUC proposal was selected for delivery in the early 2030s in all branches of the adaptive plan. A second 50 MI/d phase was required by 2040 in the plan's reported pathway and the high pathway (the most challenging future in the adaptive plan).
- 4.2.11 Following consultation on the draft WRSE Regional Plan and AfW's Draft WRMP and following further investment modelling using updated costs and

other information for Strategic Resource Options (SRO), the Revised Draft WRSE Regional Plan and AfW revised WRMP were published in August and September 2023 respectively. The revised draft plans selected the GUC Transfer Project as a single 100 MI/d phase for delivery in 2032 in all branches of the adaptive plan. The Regional Plan and WRMP identified that whilst selecting the GUC Transfer Project as a single 100 MI/d scheme increased the costs of the plan, it was considered to be an important step in the development of a robust and resilient regional water resources solution for the south east. It was also noted that bringing forward a full 100 MI/d transfer earlier in the planning period accorded with the consultation responses on the draft Regional Plan and draft WRMP which supported the earlier delivery of the full 100 MI/d scheme.

- 4.2.12 The GUC Transfer Project was selected in the WRSE Regional Plan and AfW's WRMP as a key part of the regional solution, enabling AfW to meet abstraction reduction commitments in the 2030-2035 period, allowing for earlier delivery of further environmental ambition in its supply area compared to a plan without the GUC Transfer Project. The GUC transfer proposal also enabled AfW to reduce the existing import from Grafham, benefiting the Water Resources East region through enabling a new reverse transfer between AfW and Anglian Water, which will ultimately help to support Cambridge Water.
- 4.2.13 AfW's final WRMP²⁴ was published in October 2024, confirming the selection of the single 100 MI/d GUC Transfer Option for delivery in 2032. WRSE's final Regional Plan is due to be published in Summer 2025 and this will confirm the selection of the GUC Transfer Option on the same basis.

4.3 National Policy Statement for Water Infrastructure

- 4.3.1 In October 2024, the Proposed Development was the subject of a Direction from the Secretary of State for the Environment, Food and Rural Affairs under Section 35 of the Planning Act 2008 (Ref. 7), confirming that it is a project of national significance. As a consequence of the Direction, the consenting of the Proposed Development will be through an application for Development Consent, to be determined by the Secretary of State on the advice of the Planning Inspectorate, and not through applications for planning permission.
- 4.3.2 Government policy guidance for nationally significant water resources infrastructure is set out in the NPS for Water Resources Infrastructure (April 2023) (Ref. 2) and is the relevant national policy statement against which the DCO application will be considered.
- 4.3.3 The NPS states in paragraph 1.4.5 that:

"If a nationally significant infrastructure project is included in a published final water resources management plan, the 'need' for that scheme will have been demonstrated in line with government policy. The applicable statutory requirements, and 'need' would not be expected to be revisited as part of the application for development consent. The Examining Authority and the Secretary of State would then start their assessment of applications for infrastructure covered by the National Policy Statement on that basis."

- 4.3.4 Similar policy advice is provided in paragraph 2.4.4 of the NPS. It is emphasised that paragraphs 1.4.5 and 2.4.4 of the NPS make it clear that if a specific project or scheme is included in a published final WRMP then the need for that specific scheme or project is demonstrated and it is not subsequently necessary at DCO application stage to revisit or further demonstrate the need for that scheme or project.
- 4.3.5 AfW's WRMP makes clear that its strategic plan 'Preferred Solution' includes strategic supply options based on the initial development of the 100 MI/d GUC transfer (see WRMP 24 page 274 'Our Preferred Solution'). Within the WRMP24 at paragraph 7.32, the GUC transfer is described in the following way:
- "This transfer will take treated water from Severn Trent's Minworth site, via a new closed pipeline transfer (circa 15.5 km) to a location on the canal near Atherstone in Warwickshire. The transfer will utilise the existing canal structure, passing through the Coventry Canal, the Oxford canal and the Grand Union canal, with a small number of pump and lock upgrades required. Water would be abstracted at a location near Leighton Buzzard and stored, before being treated at a new Water Treatment Works onsite, and then transferred to our [AfW's] supply area."*
- 4.3.6 In addition to the above, AfW's WRMP (at paragraph 7.34) makes it clear that *"The Minworth reuse SRO provides the source water"* for the GUC scheme and *"will develop additional treatment capacity at the existing Minworth Wastewater Treatment Works (WwTWs)"*. It is further made clear that this additional treatment would facilitate and enable the outflow from Minworth, part of which would be diverted to support the GUC strategic transfer.
- 4.3.7 The inclusion of the specific GUC Transfer project within AfW's published final WRMP24, therefore, establishes the need for the project (as it is described in the WRMP24) in accordance with the NPS. The need for the specific project as described above is, therefore, established in the NPS and does not need to be further demonstrated or established.
- 4.3.8 As the need for the specific GUC Transfer project is already established through AfW's WRMP24 and the NPS, the approach to the consideration of alternatives to the project within the DCO application that is being adopted is that the process already carried out through the WRMP process can be relied upon and does not need to be revisited or retested during the DCO application process.

4.4 Regulatory Alliance for the Progression of Infrastructure Development

- 4.4.1 RAPID comprises experts from the Environment Agency, Ofwat and the Drinking Water Inspectorate. Its purpose is to help accelerate the development of new water infrastructure and design future regulatory frameworks for them, focusing on Strategic Resource Options (SRO). SROs are strategic schemes that have the potential to provide solutions to water needs for regions and between regions across England. RAPID's work facilitates the investigation of potential SROs to better understand the

amount of water they can provide, the earliest date the water will be available and the area(s) that would benefit. RAPID works alongside the five regional water resources planning groups, to ensure the timely delivery of new infrastructure. Where necessary, RAPID assists the regulators in identifying and overcoming potential regulatory and commercial barriers. The RAPID process involves a series of technical, financial and environmental investigations and studies which are reported through a series of RAPID gates. These enable RAPID to receive and consider the outcomes of studies and investigations on the SROs, set out and consult on their draft conclusions, and provide a final decision on whether and how the SRO should continue to be assessed and promoted. The GUC Transfer project is identified as an SRO and has been progressed through the RAPID process.

- 4.4.2 The GUC Transfer project is identified and has been progressed through the RAPID process as two constituent SROs – Minworth SRO for treating and providing the water to the canal network, and GUC SRO for transferring the water through the canal network, treating it and transferring it into public supply.
- 4.4.3 For the Minworth SRO and GUC SRO, the RAPID process to date comprises:
 - a. Gate 1 Reports submitted to RAPID in July 2021 (Ref. 8);
 - b. Gate 2 Reports submitted to RAPID in November 2022 (Ref. 9); and
 - c. Gate 3 Reports due to be submitted to RAPID in Q2 2025. Gate 4 Reports will be submitted to RAPID after the application for Development Consent (the DCO application) for the Proposed Development has been submitted to the Planning Inspectorate and accepted for Examination. This is anticipated to be in early 2027.

4.5 Site and Route Optioneering

- 4.5.1 Through the RAPID gate process, optioneering exercises have been undertaken to assess the following:
 - a. Site locations for the Advanced Water Treatment Plant (AWTP) at Minworth;
 - b. Routes for the transfer of treated water from Minworth to the canal network;
 - c. Storage and water treatment site options at the southern end of the Grand Union Canal; and
 - d. Routes for the transfer of water from the storage and water treatment site to AfW storage.
- 4.5.2 This work has informed, as appropriate, the position set out within the AfW WRMP24.
- 4.5.3 Ongoing optioneering work during Gate 3 has been undertaken using an evaluation process comprising engineering, environmental, planning and land appraisals. This evaluation process included a review of the optioneering work undertaken during Gates 1 and 2. Gate 4 will occur after the DCO application has been submitted and accepted for Examination. This

will ensure consistency between the location and the design of the Proposed Development presented in the DCO application and in the submission to RAPID.

- 4.5.4 Exclusionary criteria were used to ensure that identified options avoided, as far as practicable, constraints and designations that are likely to represent significant challenges to securing necessary consents for development and pose risks to delivery of the scheme. These criteria were used to define the initial route corridors and sites available to the project, seeking to identify and exclude sites and options. Exclusionary criteria differ for site and pipeline development, reflecting that pipeline developments have less requirement for above ground, permanent development.
- 4.5.5 Site and route options were then screened against engineering, environment, planning and land criteria. This facilitated a comparison assessment of the corridors and sites against criteria derived from national policy objectives and/or engineering requirements and known environmental limitations that inform the project's design. This stage was used to identify which pipeline corridors and sites were considered less preferable and unlikely to proceed.
- 4.5.6 The next stage involved workshops with and discussions between engineering, environment, planning and land specialists to discuss their respective findings, identify the options with the greatest potential and discuss and challenge the justifications for their selection or rejection. The workshops and discussions enabled the outcomes to be carefully reviewed to ensure all options were considered comparatively as appropriate, with the results robustly tested. The workshops considered the need for verification of assessments undertaken and also identified areas where additional consideration of opportunities and constraints relating to options identified as having the greatest potential was necessary.
- 4.5.7 The options with the greatest potential were identified for consideration through non-statutory consultation.
- 4.5.8 It is expected that the consideration of alternatives will be informed by ongoing consultation, including the Statutory Consultation to be undertaken prior to submission of the DCO application.

4.6 Matters to be reported in the ES

- 4.6.1 In accordance with the requirements of the EIA Regulations and the NPS for Water Resources Infrastructure, the ES will present a description of the reasonable alternatives considered by the Applicants, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. This will include:
 - a. A summary of the water resources management plan options appraisal process;
 - b. An account of the optioneering work undertaken during Gates 1 – 3 and the evaluation process leading to non-statutory consultation;

- c. The outcomes of the further work undertaken to determine a preferred pipeline route and outfall location to the canal at Atherstone; and a preferred storage and treatment site at the southern end of the canal and associated pipeline route to AfW storage;
- d. The results of the further assessment of the interventions required on the canal network, including the extent of bank raising required; and
- e. A description of any alternative construction methods, structure/building design, operational processes and mitigation measures considered by the Applicant and project team.

‘No Development’ Scenario

- 4.6.2 A ‘no development’ scenario would not deliver the new water supply requirements clearly established through the water resource planning process described in Section 4.2. The ‘no-development’ scenario will therefore not be assessed as a reasonable alternative as part of the EIA. This does not preclude the use of the ‘no-development’ position also referred to as a ‘do nothing’ scenario in certain technical chapters of the EIA Scoping Report where this is required to present future baseline conditions in relation to the impact assessment.

4.7 References

- Ref. 1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 20/03/2025].
- Ref. 2 Department for Environment, Food & Rural Affairs (Defra) (2023). National Policy Statement for Water Resources Infrastructure. Available at: https://assets.publishing.service.gov.uk/media/6437e3a2f4d420000cd4a1a7/E02879931_National_Policy_Statement_for_Water_Resources.pdf [Accessed 20/03/2025].
- Ref. 3 Severn Trent (2024), Draft Water Resources Management Plan.
- Ref. 4 Affinity Water (2024) Water Resources Management Plan 2024.
- Ref. 5 WRW (2022) Draft Water Resources West Regional Plan.
- Ref. 6 WRSE (2022) Regional Plan Water Resources South East. Available at:
- Ref. 7 Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed 20/03/2025].
- Ref. 8 Ofwat (2021) Gate 1 Submissions and Final Decisions – RAPID Gated Process.
- Ref. 9 Ofwat (2022) Gate 2 – RAPID Gated Process.

Chapter 5: Consultation

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5. Consultation

5.1 Context

- 5.1.1 Effective stakeholder engagement and consultation is integral to the Planning Act 2008 (Ref. 1) and fundamental to the success of the Proposed Development. In accordance with the Aarhus Convention, the non-statutory and statutory consultation stages of the Proposed Development will enable access to information and public participation.
- 5.1.2 The process of consultation is, amongst other things, critical to the evolution of the Proposed Development design, identification of mitigation measures and enhancement opportunities, and for collating a comprehensive and balanced Environmental Statement (ES). The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation measures to be incorporated into the project design thereby limiting adverse effects and enhancing environmental benefits.
- 5.1.3 The Proposed Development has a wide range of stakeholders (including landowners, statutory consultees, local communities and specialist interest groups) with differing interests that will require varied levels of consultation. Specific communication activities therefore need to be focussed to meet the needs of particular individuals and groups. This requires an understanding of the stakeholders and their interests in the Proposed Development.
- 5.1.4 Stakeholder engagement for the Proposed Development is based on the following principles:
- a. Early and ongoing engagement to inform and influence the design process;
 - b. Seeking feedback on the iterative design process and taking this feedback into consideration;
 - c. Building of long-term relationships with key stakeholders throughout the different stages of the Proposed Development to help better understand their views;
 - d. Where possible and practicable, ensuring concerns are addressed; and
 - e. Ensuring appropriate statutory consultation is undertaken in compliance with requirements of the Planning Act 2008, The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations') (Ref. 2) and associated guidance.

5.2 DCO Consultation Requirements

- 5.2.1 The Development Consent Order (DCO) process has a number of statutory requirements regarding consultation. These requirements stipulate that certain stakeholder groups, the community and interested parties (being

people with an interest in the land or who would be entitled to make a claim) must be consulted as part of the pre-application process, as set out in Sections 42, 47 and 48 of the Planning Act 2008 (Ref. 1), and Regulation 13 of the EIA Regulations (Ref. 2).

- 5.2.2 Further requirements of the Planning Act 2008 and the EIA Regulations set out how the Proposed Development must be publicised, and specific documents produced, including a Statement of Community Consultation (SoCC), Preliminary Environmental Information Report (PEIR) and a Consultation Report.
- 5.2.3 In accordance with the consultation requirements set out within the Planning Act 2008, the EIA Regulations and good practice, the following consultation has or will be undertaken to inform the proposals for the Proposed Development prior to the submission of the DCO application:
 - a. Non-statutory consultation (completed between September and October 2024);
 - b. EIA Scoping consultation;
 - c. Statutory consultation;
 - d. Ongoing technical engagement; and
 - e. Ongoing engagement with potentially affected landowners and local communities.
- 5.2.4 Further details on each of these stages of consultation is provided in sections below.

5.3 Non-Statutory Consultation

- 5.3.1 The Applicants undertook a round of non-statutory consultation, which ran for six weeks from 11 September to 25 October 2024. A series of consultation events and pop-up events were held at various locations along the route of the Proposed Development to maximise stakeholder engagement and accommodate varied interests across the project. The consultation was advertised via:
 - a. 14,000+ postcards to local residents;
 - b. Posters across local communities;
 - c. Press releases through local and trade media;
 - d. Emails to 250 stakeholders; and
 - e. Contact with 7,000+ boating customers.
- 5.3.2 The non-statutory consultation documents are available on the project website (Ref. 3).
- 5.3.3 The purpose of the consultation was to gain feedback from technical consultees and from landowners, interest groups and members of the public that might be affected by the Proposed Development or wish to express an interest in it. As well as feedback on the Proposed Development in general, the Applicants also requested feedback on a number of potential development sites and pipeline corridors (and in the case of the Part 1b

pipeline, the associated outfall locations at Atherstone), including how it had identified and assessed potential options to date.

- 5.3.4 The feedback received on the site and route options presented at non-statutory consultation is summarised in **Chapter 4: Consideration of Alternatives**.
- 5.3.5 Topic-specific comments, and how these have been taken into account, are set out within **Chapters 8 to 22** of this EIA Scoping Report.

5.4 Scoping Consultation

- 5.4.1 The Planning Inspectorate (PINS) (on behalf of the Secretary of State [SoS]) will consult on this Scoping Report in accordance with the EIA Regulations (Ref. 2). Views from consultees will be considered and used to inform the Scoping Opinion to be issued by PINS (on behalf of the SoS).
- 5.4.2 Under Regulation 10(6) of the EIA Regulations, the SoS must undertake consultation with statutory consultation bodies, including environmental bodies (such as Natural England, the Environment Agency and Historic England) and relevant planning authorities (including the ten host local planning authorities) before adopting a Scoping Opinion.

5.5 Statutory Consultation

- 5.5.1 Prior to submission of the application for a DCO, the Applicants will undertake statutory consultation in accordance with the Planning Act 2008 (Ref. 1) and the EIA Regulations (Ref. 2). In accordance with Section 47(1) of the Planning Act 2008, the Applicants will prepare a SoCC. This will outline how the Applicants intend to formally consult with the local community about the Proposed Development, including, in accordance with Regulation 12 of the EIA Regulations, and how they intend to publicise and consult on the PEIR. The Applicant is required to consult the local authorities identified pursuant to Section 43 of the Planning Act 2008 on the draft SoCC and they will have a period of at least 28 days following receipt of the request to comment on a draft SoCC prior to its publication for inspection by the public.
- 5.5.2 The outcomes of the non-statutory and statutory consultations will be considered as part of the EIA process and feedback will be incorporated into the final Proposed Development prior to the submission of the DCO application. The outcomes of consultation and how regard has been had to feedback will be reported in the Consultation Report submitted with the DCO application.

5.6 Ongoing Technical Engagement

- 5.6.1 Technical engagement on the Proposed Development has been undertaken and is ongoing as part of the Regulatory Alliance for Progressing Infrastructure Development (RAPID) gated process. RAPID is comprised of representatives from Ofwat, the Environment Agency and the Drinking Water Inspectorate. Engagement with the National Appraisal Unit, comprising the Environment Agency and Natural England, has been undertaken throughout the RAPID process and has included bi-monthly meetings to provide

comprehensive updates and receive feedback on environmental assessments and monitoring.

- 5.6.2 Engagement on the emerging proposals for the Minworth and GUC Strategic Resource Options (SRO) began in 2020 and continued through RAPID Gates 1, 2 and 3. This has included the preparation of an extensive body of technical work which, for Gate 1 and Gate 2 is available on the Affinity Water website (Ref. 4). The assessments for Gate 3 have been completed and the reports will be published as part of the Gate 3 submission to RAPID to be made once the EIA Scoping Opinion has been received. The technical assessments completed and consulted on through the RAPID process have assisted in defining the Proposed Development and requirements for mitigation to date. Gate 4 of the RAPID process will be completed in parallel with the preparation of the DCO application for the Proposed Development.
- 5.6.3 In addition to the regulatory engagement completed as part of the RAPID process, ongoing technical engagement with statutory stakeholders will be undertaken as part of the EIA work. This will include (but not be limited to) discussion on proposed assessment methodologies, assumptions and limitations, baseline conditions, likely significant effects and mitigation options. A forum of the ten host authorities referred to as the Local Authority Liaison Group (LALG) has been established to enable the Applicants to provide project updates and receive feedback on the emerging proposals. Via LALG it intended that topic-specific technical working groups will be established to engage of particular environmental topics and aspects of the Proposed Development.
- 5.6.4 Further details on topic-specific technical engagement undertaken to date and proposed to be undertaken is set out within **Chapters 8 to 22** of this EIA Scoping Report.

5.7 References

- Ref. 1 Planning Act (2008). Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed 20/03/2025].
- Ref. 2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 20/03/2025].
- Ref. 3 Affinity Water, Severn Trent and Canal & River Trust (2024) Grand Union Canal Transfer project website. Available at: <https://guctransfer.co.uk/> [Accessed 20/03/2025].
- Ref. 4 Affinity Water Website (2024) Strategic Resource Options. Available at: <https://affinitywater.uk.engagementhq.com/strategic-resource-options> [Accessed 20/03/2025].

Chapter 6: EIA Approach

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6. EIA Approach

6.1 Introduction

- 6.1.1 This chapter sets out the proposed overarching approach to the Environmental Impact Assessment (EIA) of the Proposed Development. Topic-specific methods of assessment are presented in **Chapters 8-22** of this EIA Scoping Report.
- 6.1.2 This chapter is supported by:
- a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 6-1: Distance Based Zone of Influence of ≤ 500 m;**
 - ii. **Figure 6-2: Distance Based Zone of Influence of 1 km and Above;**
 - iii. **Figure 6-3: Zone of Influences 1 Hour Drive Time; and**
 - iv. **Figure 6-4: Zone of Influences Hydrological Features.**
 - b. The following appendices in Volume 3 of this EIA Scoping Report:
 - i. **Appendix 6-1: Indicative Long List of Cumulative Schemes; and**
 - ii. **Appendix 6-2: Transboundary Effects Screening Matrix.**

6.2 The Purpose and Process of EIA

Purpose

- 6.2.1 EIA is a process for identifying the likely significant environmental effects (beneficial and adverse) of a project to inform the decision-making process for development consent to be granted. The EIA process will culminate in the preparation of an Environmental Statement (ES), in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations') (Ref. 1), that will provide an assessment of the likely significant effects associated with the Proposed Development during the construction and operation phases.
- 6.2.2 Schedule 4(4) of the EIA Regulations specifies that the ES should describe the:
- “...factors...likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.”*
- 6.2.3 Regulation 5(2) of the EIA Regulations requires the interaction between these factors to be considered. In addition, Regulation 5(4) requires an ES to consider “...the expected significant effects arising from the vulnerability of

the proposed development to major accidents or disasters that are relevant to that development”.

- 6.2.4 The EIA process aims to be systematic, analytical, impartial, consultative and iterative allowing opportunities for environmental concerns to be addressed in the design and evolution of the Proposed Development.
- 6.2.5 A number of iterations are probable to take place in response to likely environmental impacts identified during the EIA process, stakeholder engagement and consultation prior to the final design being submitted for approval. This iterative design process is fundamental and is described further below.

EIA Process

- 6.2.6 In October 2024, under Section 35 of the Planning Act 2008 (Ref. 2), the Secretary of State (SoS) directed that the Proposed Development would be defined as a Nationally Significant Infrastructure Project (NSIP), to be treated as a project for which a Development Consent Order (DCO) is required from the SoS. The key documents produced as part of the DCO EIA process comprise:
 - a. **EIA Scoping Report:** The Scoping Report (this document) sets out the environmental effects from the Proposed Development that appear likely to be significant at this stage. It therefore helps define which environmental matters should be scoped into the EIA and assessed in the ES. The Scoping Report also identifies the different methodologies used for the assessment, based on recognised good practice and guidance. It is intended to assist the Planning Inspectorate (PINS) – who will act on behalf of the SoS – in reaching a Scoping Opinion. PINS will follow Advice Note Three: ‘EIA notification and consultation’ (Ref. 3) when notifying and consulting the prescribed consultation bodies on the scope of ESs for NSIPs;
 - b. **Preliminary Environmental Information Report (PEIR):** The PEIR is defined in the EIA Regulations (Regulation 12(2)(b)) as:
“...information referred to in regulation 14(2) which has been compiled by the applicant; and is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)”. The PEIR helps inform consultees consultation responses during the Statutory Consultation and provides an opportunity for both the design of the Proposed Development and the EIA to take into consideration any comments received through this consultation; and
 - c. **ES:** The ES will be based on the Scoping Opinion issued by PINS, and it will present the results of the EIA of the Proposed Development. It will identify the likely significant environmental effects that would result if the Proposed Development were consented and detail the measures envisaged to prevent or offset any significant adverse environmental effects, as well as seeking to enhance beneficial effects where practicable.

6.3 Receptor-based approach

- 6.3.1 In this EIA Scoping Report, and ultimately the ES, the methodology for assessing the significance of an effect will vary between environmental aspects. A receptor-based approach is proposed. Receptors are those aspects of the environment which may be sensitive to change as a result of the Proposed Development. This approach determines the significance of effect based on the environmental sensitivity (or value or importance) of a receptor and the magnitude of change from baseline conditions that it experiences.
- 6.3.2 When deciding on which receptors to include in the EIA, consideration was given to Regulation 5(2) and Schedule 4 paragraph 4 of the EIA Regulations.
- 6.3.3 Where aspect-specific guidance requires that particular criteria or scales for determining significance are to be used, this is outlined in the relevant topic chapter. The EIA Scoping Report, and ultimately the ES, is also supported by professional judgement and discussion from the technical specialist author to justify the final judgements on significance.
- 6.3.4 In instances where limited information is available, assessments have and will continue to apply a precautionary principle, in that reasonable 'worst-case' scenario is assessed.

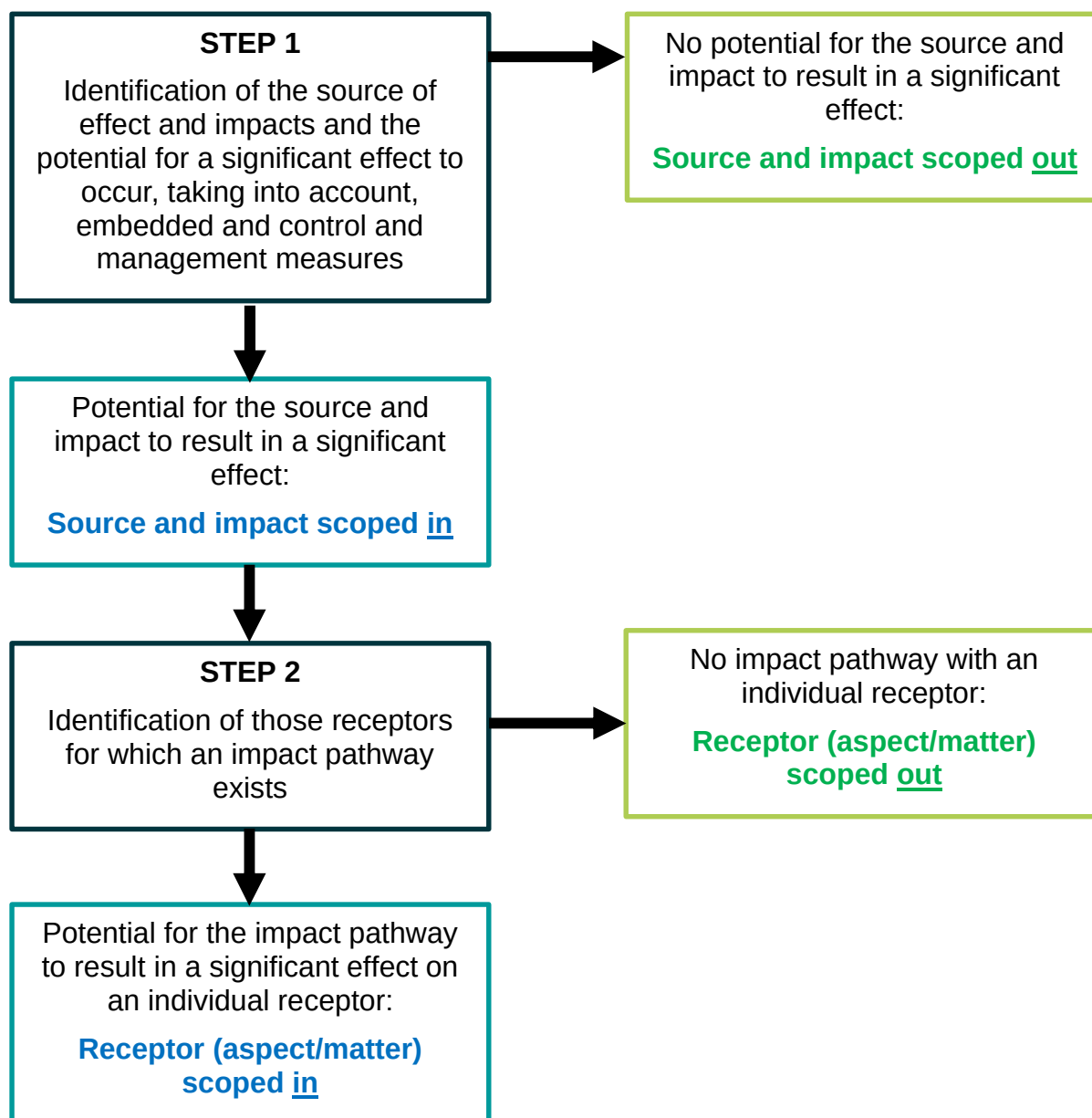
6.4 The 'Rochdale Envelope' approach

- 6.4.1 At this stage of the design, an element of flexibility needs to be retained, both in the parameters of the Proposed Development and in the application site boundary, in order to address uncertainties where some elements are yet to be confirmed. The EIA Scoping Boundary and the parameters of the Proposed Development are therefore based on a suitable 'Rochdale Envelope' having regard to the PINS's Advice Note Nine: 'Rochdale Envelope' (Ref. 4), allowing for a realistic worst-case assessment to be undertaken and providing sufficient flexibility for the design to evolve.
- 6.4.2 The Scoping Report establishes the relevant design parameters for the purposes of the Scoping Opinion. Where uncertainty surrounds a particular parameter, the Scoping Report assumes a maximum design scenario, i.e. it has established those parameters likely to result in the maximum adverse effect (the worst-case scenario).
- 6.4.3 The reasonable worst-case scenario for any given design parameter may vary by environmental aspect, depending on how that particular parameter may interact with the receptor being considered.

6.5 Determining the scope of the assessment

- 6.5.1 The EIA scoping process establishes which aspects of the environment are likely to be significantly affected by a project and involves identifying:
 - a. The people and environmental resources (collectively known as 'receptors') that could be significantly affected by the Proposed Development; and
 - b. The work required to take forward the assessment of the likely significant effects.

- 6.5.2 Scoping is an important procedure, which sets the context for the EIA process. It is intended to inform a proportional and robust approach to assessment through initial evaluation and reporting of identified likely significant effects in a Scoping Report.
- 6.5.3 Effective scoping enables agreement to be reached on the aspects and methodologies to be taken forward, assessed and reported in much greater detail in the ES. It also provides an opportunity for early interaction with stakeholders, strengthening the assessment evidence base and allowing active participation of interested parties in project development and decision making. This can in turn improve project design, environmental soundness and social acceptability.
- 6.5.4 The approach taken in preparation of this Scoping Report has also been informed by PINS's Advice Note Seven: 'Environmental Impact Assessment: Process Preliminary Environmental Information and Environmental Statements' (Ref. 5) and reflects that the EIA Regulations require an ES to focus on aspects of the environment likely to be subject to significant effects. In line with guidance and legislation, this Scoping Report seeks to, where appropriate, scope out aspects/matters from further assessment with suitable justification provided. This will streamline the assessment to focus on likely significant effects and ensure the EIA is proportionate in accordance with the Institute of Environmental Management and Assessment's (IEMA) 'Delivering Proportionate EIA' guidance document (2017) (Ref. 6).
- 6.5.5 When considering which aspects of the environment have the potential to be significantly affected by the Proposed Development and therefore which aspects should be scoped into the assessment, a conceptual 'source-pathway-receptor' approach has been adopted which considers the following criteria:
- a. **Source:** location of a material or activity that may be harmful, i.e. the origin of the potential impacts (such as pipeline installation and a resultant impact, e.g. mobilisation of contaminants);
 - b. **Pathway:** the route by which a harmful action or material is able to reach the receptor (e.g. the mobilisation of contaminants could enter a local surface waterbody); and
 - c. **Receptor:** the feature or aspect of the receiving environment that is impacted, such as: humans, property, ecology, habitat, landscape, atmosphere, water (for the example above, species living within the local waterbody).
- 6.5.6 Once the above criteria have been identified, they should be examined to assess the potential impact(s) upon a receptor, and ultimately the significance of the effect upon the receptor. In general, the impact assessment for each aspect will adopt this approach when considering the potential impacts arising during the construction and operation phases of the Proposed Development. This approach allows for a transparent impact assessment and clear justification as to why particular aspects are either scoped in, or scoped out of, the EIA process. This approach is presented in **Plate 6-1** below.

Plate 6-1: Process for determining 'source-pathway-receptor'

Technical scope

- 6.5.7 The technical scope of assessment for each environmental aspect is detailed in **Chapters 8 to 22** of this EIA Scoping Report and this covers the scoping in and out of impacts and effects to be assessed as part of the EIA. Justification is provided for the individual approach and scoping of matters to be considered in the assessment for each environmental aspect. The technical scope also details the approach to baseline data collection and assessment methodologies.

Spatial Scope

- 6.5.8 As described in **Chapter 3: Description of the Proposed Development** (and shown on figures presented in Volume 2 of the EIA Scoping Report), an 'EIA Scoping Boundary' has been defined for the purposes of this EIA Scoping Report to indicate areas in which land, or rights over or under land,

are anticipated, at this stage, to potentially be required for works associated with the Proposed Development. The land required for the Proposed Development, within the envelope of the EIA Scoping Boundary, is subject to change as design work progresses (and will be assessed in the PEIR and ES), considering environmental and technical factors, and consultation feedback. It is however considered to provide a sound basis for the purpose of identifying potential significant environmental effects.

- 6.5.9 As described in **Chapter 3: Description of the Proposed Development**, for Part 2 of the Proposed Development, the EIA Scoping Boundary has been divided into an 'Indicative Work Area' and an 'Indicative Non-Work Area'. The Indicative Work Area for Part 2 of the Proposed Development includes areas in which land, or rights over or under land, are anticipated, at this stage, to potentially be required for works associated with the Proposed Development. The Indicative Non-Work Area includes areas of land where no works are proposed, however, which are required to operate the Proposed Development. For the avoidance of doubt, it is only Part 2 of the Proposed Development, where a differentiation between Indicative Work Areas and Non-Work Areas is necessary. For all other parts of the Proposed Development, there are no Non-Work Areas.
- 6.5.10 PINS Advice Note Seven (Ref. 5), PINS recommends that a shapefile *"...representing the proposed DCO site boundary (including any temporary, permanent and associated development)"* is submitted with the Scoping Report. This has been provided separately for the EIA Scoping Opinion Request.
- 6.5.11 The spatial scope for each environmental aspect, i.e. the area over which changes to the environment are predicted to occur as a consequence of the Proposed Development, will depend on the nature of the potential effects and the location of receptors that could be affected. It takes account of:
- a. The physical area of the Proposed Development;
 - b. The nature of the baseline environment;
 - c. The manner and extent to which environmental impacts may occur; and
 - d. Relevant guidance, best practice and/or legislation.
- 6.5.12 The geographical extent of the study areas will thus generally be greater than the EIA Scoping Boundary and will vary depending on the environmental aspect and specific receptors or resources under consideration for that aspect. For each aspect, the study area proposed is of sufficient size to encompass the spatial extent over which relevant impacts on receptors or resources might occur.
- 6.5.13 Each of the technical methodologies (**Chapters 8 to 22**) describes the study area to be considered, providing a clear explanation as to why the study area has been adopted. The spatial scope of each assessment may be refined for both the PEIR and the ES in response to comments from consultees and/or further assessment or survey work.

Temporal scope

- 6.5.14 The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur, and are typically defined as either being temporary or permanent:
- a. **Permanent:** these are effects that will remain even when the Proposed Development is complete, although these effects may be caused by environmental changes that are permanent or temporary; or
 - b. **Temporary:** these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes.
- 6.5.15 In order to predict the potential environmental effects of the Proposed Development, it will be necessary to determine the environmental conditions that currently exist within the EIA Scoping Boundary and surroundings, in the absence of the Proposed Development. These are known as 'baseline conditions'.
- 6.5.16 The EIA will assess the changes (impacts) to the current and future baseline during the construction and operation of the Proposed Development.

Decommissioning effects

- 6.5.17 The EIA Scoping Report seeks to scope out decommissioning effects on the basis that the Proposed Development will be operated indefinitely.
- 6.5.18 However, as part of maintenance during the operation phase of the Proposed Development, there is likely to be replacement of plant/equipment (such as pipeline) as a result of general wear and tear and life expectancy. Therefore, the ES project description will clearly set out the predicted requirements and timescales for dismantling and replacement of equipment during operation, including the process and methods, and any land use requirements. Where this information is not known, parameters representing a worst-case scenario will be provided. The ES will also assess any likely significant effects arising from this activity. Any measures required to mitigate significant adverse effects from such activity will be described and demonstrably secured in the DCO.

Baseline scenarios

- 6.5.19 The ES will identify the following baseline scenarios:
- a. **Existing baseline:** current baseline conditions based on desktop studies and surveys. The baseline is the reference level of the environmental conditions without implementation of the Proposed Development, against which the potential impacts of the Proposed Development are to be assessed; and
 - b. **Future baseline:** the future conditions without the Proposed Development in place, against which the potential impacts of the Proposed Development are to be assessed, if these conditions differ substantially from the existing baseline. When describing the future baseline scenario for each technical topic, the current baseline will be extrapolated to take account of anticipated change factors including,

but not limited to, those caused by changing climatic conditions, natural evolution or planned management of habitats, changes to policy or legislation, expected new development (including other planned infrastructure projects) to provide a description of the likely changes to the baseline environment over an appropriate timescale that can be supported by datasets and modelling.

Assessment scenarios

6.5.20 The ES will consider the following assessment scenarios:

- a. **Construction assessment:** impacts from across the whole duration of the construction period will be considered within the environmental assessments. Where appropriate for some topics, such as traffic, air quality and noise and vibration, a peak year of construction will be assessed, as this will represent a worst-case scenario; and
- b. **Operational assessment:** impacts at the opening year of the Proposed Development will be considered. A further future year of assessment may also be considered for landscape and visual effects, when any mitigation planting has fully established.

6.5.21 Further details of any topic specific considerations for assessment scenarios are provided in **Chapters 8 to 22** of this EIA Scoping Report.

6.5.22 The environmental assessments will use defined temporal scales to characterise the duration of potential effects. When addressing the duration of an effect, the following terminology will be used:

- a. **Temporary:** short, medium or long-term (e.g. a short-term temporary effect relates to an activity with a duration from several weeks to a few months, a medium-term temporary effect is estimated to be several months to a year and long-term estimated to be several years);
- b. **Reversible:** effects which occur temporarily but cease once the impact causing activity has stopped; and
- c. **Permanent:** effects that are non-reversible, generally associated with the complete and operational Proposed Development.

6.5.23 The temporal nature of effects may extend longer than the phase in which the effects originally occur. For example, effects as a result of vegetation clearance during construction may be experienced for a number of years after construction has been completed, until any replanted habitats have matured. For the purposes of the EIA, the effects are described under the phase within which the impact arises, (i.e. in the above example, vegetation loss is assessed under the construction phase).

6.6 Assessment of effects and determining significance

Overview

6.6.1 For consistency, and to allow comparison between aspects, the methodology described in this section will be applied when preparing the ES. This methodology is designed to consider whether impacts of the Proposed Development would have an effect on any environmental receptors. Assessments will consider the magnitude of impacts and the sensitivity of

resources or receptors that could be affected in order to classify the significance of effects.

- 6.6.2 The conclusion that is made on whether an effect should be considered significant is based upon professional judgement, with reference to the description of the Proposed Development and available information about:
- The magnitude and other characteristics of the potential changes (impacts) that are expected to be caused by the Proposed Development;
 - The sensitivity of receptors to these changes;
 - The effects of these changes on relevant receptors; and
 - The value of receptors (where relevant).
- 6.6.3 For each environmental aspect, the categories of resource or receptor sensitivity and magnitude of impact will be described or defined.
- 6.6.4 The sensitivity or value of a receptor is largely the product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, higher value receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be designated as being sensitive or important at a county or district level.
- 6.6.5 The use of a receptor also plays a part in the classification of its value or sensitivity. For example, when considering visual amenity, a receptor which is residential in nature may be valued more than a place of work as the environmental quality of the residential receptor is more likely to be an important part of that receptor's use. General criteria for defining the importance or sensitivity of receptors are set out in **Table 6-1**.

Table 6-1: Sensitivity of Receptors

Sensitivity	Description
High	Receptor has little or no ability to absorb change without fundamentally altering its character. For example: - Receptor has capacity to return to baseline conditions within the project life, e.g. low tolerance to change and low recoverability such as a physical feature formed over a geological time scale, or loss of access with no alternatives; - The receptor is a designated feature of a protected site or is rare or unique; or - Receptor is economically valuable.
Medium	Receptor has moderate capacity to absorb change without significantly altering its character, however some damage to the receptor will occur. For example: - Receptor has intermediate tolerance to change; - Medium capacity to return to baseline condition, e.g. >5 of up to 10 years; or - The receptor is valued but not protected.

Sensitivity	Description
Low	The receptor is tolerant to change without significant detriment to its character. Some minor damage to the receptor may occur. For example: • Receptor has high tolerance to change. • High capacity to return to baseline condition, e.g. within 1 year or up to 5 years; • May affect socio-economic behaviour but is not a nuisance to users; or • The receptor common and/or widespread.
Very Low	The receptor is tolerant to change with no effect on its character. The Project activity does not have a detectable effect on survival or viability.

6.6.6 The magnitude of change affecting a receptor that would result from the Proposed Development will be identified on a scale from minor alterations or change, up to major changes or the total or substantial loss of the receptor. For certain aspects, the magnitude of change would be related to guidance on levels of acceptability (e.g. for air quality or noise) and is therefore based on numerical parameters. For others it will be a matter of professional judgement to determine the magnitude of change, using descriptive terminology.

6.6.7 **Table 6-2** sets out the guidelines of the assessment of the magnitude of impact. Where relevant, individual topic chapters set out variations in magnitude description requirements.

Table 6-2: Impact Magnitude

Magnitude	Criteria
High	Long-term and/or regional level loss; or major alteration to key elements / features of the baseline condition such that post development character / composition of the baseline will be fundamentally changed.
Medium	Medium-term loss and/or local level change (greater than the Proposed Development's footprint) or alteration to one or more key elements / features of the baseline conditions such that post development character / composition of the baseline condition will be materially changed.
Low	Short-term, site-specific and/or a minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character / composition of the baseline condition will be similar to the pre-development situation.
Very Low	Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation.

6.6.8 The environmental aspect chapters (**Chapters 8 to 22**) provide greater detail on the approach to the assessment and specific guidelines for the definition of impact magnitude and resource or receptor sensitivity. Where applicable standards mandated by professional bodies (e.g. the Chartered Institute of

Ecology & Environmental Management [CIEEM] or the Landscape Institute) will also be considered.

Determination of significance

- 6.6.9 The significance of effects is derived with reference to information about the nature of the Proposed Development, the sensitivity or value of receptors that could be affected, together with the magnitudes of change that are likely to occur.
- 6.6.10 For many environmental aspects, significance can be determined by using a matrix. Variations to this matrix approach, which may be applicable to specific environmental aspects are detailed within the respective chapters (**Chapters 8 to 22**), along with descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant. Definitions of how the categories that are used in the matrix are derived for each environmental aspect are also set out.
- 6.6.11 In addition, professional judgement is applied in the assessment, as the boundaries between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions may need clarifying.
- 6.6.12 The overarching significance matrix that will be used to classify effects is shown in **Table 6-3**. Reference is made to:
- 'Major' effects, which will always be determined as being significant;
 - 'Moderate' effects can be significant, or not significant, based on specific scenarios and/or professional judgement; and
 - 'Minor' or 'negligible' effects, which will always be deemed as 'not significant'.
- 6.6.13 Effects can be either beneficial or adverse.

Table 6-3: Classification of effects

Magnitude	Value and sensitivity of receptor			
	Very Low	Low	Medium	High
Very Low	Negligible	Negligible	Minor	Minor
Low	Negligible	Minor	Minor	Moderate
Medium	Minor	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

- 6.6.14 **Table 6-4** provides general definitions of effects, although this may vary depending upon the topic. Where relevant, the respective topic chapter in the ES will provide any alternative definitions.

Table 6-4: Generic effect definitions

Effect	Criteria
Major	These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national

Effect	Criteria
	importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.
Moderate	These effects, if adverse, are likely to be important at a local scale and on their own could have a material influence on decision making.
Minor	These effects may be raised as local issues and may be of relevance in the detailed design of the project but are unlikely to be critical in the decision-making process.
Negligible	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.

6.7 Mitigation Measures and Monitoring

Categories of Mitigation Measures

- 6.7.1 In accordance with Regulation 14(2)(c) of the EIA Regulations, the ES will include a description of the “...*measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects of the Project on the environment*”. For each environmental aspect, the EIA process will systematically identify impacts and effects and take into consideration mitigation measures that the Proposed Development will adopt.
- 6.7.2 These mitigation measures include avoidance, best practice and design commitments, which are classified into the following:
- Embedded mitigation (inherent):** Measures which form part of the design of the Proposed Development. They can include modifications to the location, design or operation of the Proposed Development made during the pre-application phase. Examples would include amending the location of the Proposed Development to avoid a sensitive feature such as a designated nature conservation site or reducing the height of a structure to minimise visual effects. They form an inherent part of the Proposed Development, and do not require additional action to be taken;
 - Standard measures (inexorable):** Measures that would occur with or without input from the EIA feeding into the design development process. These include actions that will be undertaken to meet other existing legislative requirements or actions that are considered to be standard good practice used to manage commonly occurring environmental effects. Examples include construction management measures implemented to meet statutory standards concerning the risk of nuisance or pollution effects; and
 - Additional mitigation (foreseeable):** Measures that require further activity in order to achieve the anticipated outcome, for example action post-consent. Examples could also include an Archaeological Written Scheme of Investigation which outlines proposals for further investigation post-consent.

Design and Control Measures

- 6.7.3 EIA is an iterative process and opportunities for measures to mitigate effects will be considered throughout the design evolution of the Proposed Development and embedded into the design. These are referred to as 'design and control measures' and would be implemented as part of the Proposed Development. Generally, these measures are embedded (inherent) measures, as defined in the previous section. The assessment of likely significant effects takes these measures into account when drawing conclusions regarding significance of effects.
- 6.7.4 The iterative design evolution process involves collaborative working between the design and environment. This may be through the consideration and adoption of alternatives or through measures incorporated within the final design itself. Where possible, these measures will be developed with input from key stakeholders together with appropriate technical standards, policies and guidance.
- 6.7.5 Through the EIA process potentially significant adverse environmental effects will be fed back into the design process to verify whether they can be avoided or otherwise mitigated in accordance with the mitigation hierarchy (i.e. avoid, prevent, reduce, offset – as defined in IEMA's 'Implementing the Mitigation Hierarchy from Concept to Construction' [Ref. 7]). Alongside this, good practice control measures will be identified with reference to legislative requirements and measures of standard practice to manage commonly occurring effects.
- 6.7.6 Another category of 'design and control measures' is standard measures (inexorable). This is required by statute or legislation and can also be assumed to occur. Such measures will be taken into account when drawing conclusions regarding significance of effects.

Additional Mitigation

- 6.7.7 Following the application of design and control measures, where the potential for a significant environmental effect remains, additional mitigation will be considered to avoid, reduce or compensate this effect.
- 6.7.8 The ES will report on the anticipated effects of the Proposed Development following the implementation of all mitigation to determine the 'residual effects'. A clear statement will be made as to whether the residual effects are significant or not significant.
- 6.7.9 Residual effects may be beneficial as well as adverse.

Monitoring

- 6.7.10 The ES will outline proportionate monitoring methods to be employed to ensure the effectiveness of mitigation. This will set out who will be responsible for monitoring, and the setting of clear objectives and parameters for monitoring. The ES will also identify the actions that will be undertaken should monitoring results fall below these set parameters.

6.8 Assessment of Residual Effects and Significance

- 6.8.1 Following the identification of the Proposed Development's mitigation measures, the assessment of significance will be re-evaluated to determine whether there is likely to be a residual effect and if it remains significant.
- 6.8.2 Residual effects assessed as 'moderate' or 'major' after consideration of the Proposed Development's mitigation measures will normally require additional analysis and consultation in order to discuss and possibly further mitigate, where possible. Where further mitigation is not possible, a residual significant effect may remain.

6.9 Cumulative Effects Assessment

- 6.9.1 A cumulative effects assessment (CEA) will be carried out and will examine the result from the combined impacts of the Proposed Development with other developments on the same single receptor or resource as required under Paragraph 5 of Schedule 4 of the EIA Regulations (Ref. 1). The interaction of environmental effects occurring as a result of the Proposed Development will also be assessed in accordance with Regulation 5(2).
- 6.9.2 The EIA will include the assessment of two types of cumulative effects: **effect interactions** (also known as 'in-combination' effects) and **cumulative effects** with other developments. These are described further in the following sections.

Effect Interactions

- 6.9.3 Regulation 5(2)(e) of the EIA Regulations requires that the ES considers the interaction between population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and the landscape associated with a Proposed Development. In-combination effects are those that result from the interaction between the individual effects of the Proposed Development (i.e. interaction of environmental aspects such as air quality and noise), combined together on a single receptor or resource at a single point in time. The interaction between the individual effects may combine to result in a significant effect, even where the individual effects were not significant.
- 6.9.4 There are no specific, relevant guidelines on how the assessment of effect interactions should be undertaken, and so the assessment will be undertaken on a qualitative basis, using the results of the individual technical assessments, informed by professional judgement.
- 6.9.5 The EIA will predict beneficial and adverse effects during the construction and operational phases of the Proposed Development, which are classified as minor, moderate or major. Where several of these effects occur on one receptor or receptor group, they could theoretically interact or combine to produce a combined significant overall effect.
- 6.9.6 Residual effects, which are classified as negligible will be excluded from the assessment of the effect interactions as, by virtue of their definition they are considered to be imperceptible effects to an environmental / socio-economic resource or receptor.

6.9.7 The effects on receptors or receptor groups will be tabulated to determine the potential for effect interactions and, therefore, any combined effects. Criteria set out within will be used to determine the significance of effect interactions.

6.9.8 **Table 6-5** provides the effects interactions significance criteria.

Table 6-5: Effect Interactions Significance Criteria

Significance Category	Typical Descriptors of Effect
Major	Where the combined impacts of the Proposed Development upon an individual or collection of environmental receptors would be highly significant (beneficial or adverse). Effects would be: • Widespread/large-scale for receptors of high value; or • Permanent for a receptor or receptors of high value.
Moderate	Where the combined impacts of the Proposed Development upon an individual or collection of environmental receptors would be significant (beneficial or adverse). Effects would be: • Permanent for a receptor or receptors of medium value; • Localised for a receptor or receptors of high value; or • Temporary for a receptor or receptors of high value.
Minor	Where the combined impacts of the Proposed Development upon an individual or collection of environmental receptors would be noteworthy but not significant (beneficial or adverse). Effects would be: • Permanent for a receptor or receptors of low value; • Localised for a receptor or receptors of medium value; or • Temporary for a receptor or receptors of medium value.
No significant effect interactions	Where the combined impacts of the Proposed Development are not likely to lead to a change in the effects at a receptor, when compared with considering these impacts in isolation.

Cumulative Effects with Other Developments

6.9.9 As outlined in Schedule 4 paragraph 5(e) of the EIA Regulations, the ES is required to consider the “...*cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources*”. Cumulative effects of the Proposed Development together with the effects of other developments/schemes may result in significant effects. This may be the result of effects on the environment during construction or operation of the Proposed Development.

6.9.10 The cumulative effects assessment methodology is based on the PINS’s Advice Note Seventeen: ‘Cumulative effects assessment relevant to nationally significant infrastructure projects’ (Ref. 8) on the assessment of cumulative effects, which identifies a four-stage approach, as follows:

- a. Stage 1: Establish the study area and identify a long list of 'other developments' (the 'development schedule');
 - b. Stage 2: Identify a shortlist of 'other developments' for the cumulative impact assessment;
 - c. Stage 3: Information gathering; and
 - d. Stage 4: Assessment.
- 6.9.11 The cumulative assessment will be undertaken on a topic-by-topic basis rather than scheme-by-scheme as recommended by Appendix 2 of PINS's Advice Note Seventeen. This will be done so that a cumulative assessment of the Proposed Development with all identified cumulative developments could be provided. Information recommended to be provided by Appendix 2 of PINS's Advice Note Seventeen will still be presented.
- 6.9.12 In general, where the Proposed Development results in a negligible effect, it will not be considered that the Proposed Development could significantly contribute to a cumulative effect with other developments. This is because, by virtue of their definition, negligible effects are considered to be imperceptible changes to an environmental / socio-economic resource or receptor. Therefore, the cumulative effects assessment will focus on effects of the Proposed Development that are minor, moderate and major.

Stage 1: Establishing the Long List of Other Developments

- 6.9.13 The Stage 1 activities include establishing the Proposed Development's likely Zone of Influence (ZOI) associated with each of the environmental topic areas assessed in the ES. **Table 6-6** sets out the expected ZOIs identified for each environmental topic, which will be confirmed within the ES. **Figures 6-1 to 6-4** in Volume 2 of the EIA Scoping Report show the ZOI distances from the EIA Scoping Boundary that the environmental topics will assess in the ES.
- 6.9.14 A long list of other developments will be collated on the basis of the search criteria set out within **Table 6-7**. For planning applications granted under the Town and Country Planning Act 1990 (Ref. 9), it is considered that any development with a consent older than five years will have been built out or lapsed after the three-year consent for commencement has passed. As such, planning applications made under the Town and Country Planning Act 1990 from the last five years will be considered (i.e. from February 2020).
- 6.9.15 In considering cumulative impacts, it is essential to assess whether any large-scale, long-term development projects consented more than five years ago will have construction timelines that overlap with the construction phase of the Proposed Development. This will also be evaluated to ensure that any combined effects from concurrent developments are appropriately addressed within the assessment.
- 6.9.16 Each development within the long list of other developments will be reviewed to determine its status at the time of undertaking the assessment and assigned a final status and tier, as described in **Table 6-8**, informed by the guidance and levels presented within of PINS's Advice Note Seventeen and Appendix 1 of the Note.

- 6.9.17 The indicative long list of other developments (presented in **Appendix 6-1**, in Volume 3 of this EIA Scoping Report) will be consulted on with the local planning authorities that host the Proposed Development.

Table 6-6: Zol extents for assessment of cumulative effects

EIA Topic	Zol Extent
Agriculture and Soils	250 m from the EIA Scoping Boundary
Air Quality and Odour	<u>Dust, odour, other particulate matter emissions from construction works:</u> • Within 250 m from the EIA Scoping Boundary; • Within 50 m from the routes expected to be affected by the construction phase traffic for a distance of up to 0.5 km from the EIA Scoping Boundary access/egress points; and • Up to 250 m from the site access/egress point with the public highway. <u>Road traffic emissions:</u> • Within 200 m from all roads that trigger the traffic flow screening criteria, referred to as the affected road network (ARN).
Climate	• Greenhouse Gas emissions assessment – no cumulative assessment undertaken, refer to Chapter 10: Climate; • Climate Change Resilience – within EIA Scoping Boundary; and • In-combination Climate Impacts – reflects other ES chapters.
Cultural Heritage	• 500 m of the EIA Scoping Boundary for Parts 1b, 2, 3 and 4b and 1 km for Parts 1a and 4a for designated assets; and • 500 m of the EIA Scoping Boundary for all Parts for non-designated heritage assets.
Ecology – Aquatic & Terrestrial	• 2 km from EIA Scoping Boundary for protected and noticeable species; and • 10 km from EIA Scoping Boundary for international and national nature conservation designations.
Ground Conditions	250m for land contamination and 1km for hydrogeology receptors.
Human Health	Reflects other ES chapters.
Landscape and Visual Amenity	3 km from EIA Scoping Boundary for Parts 1b, 2, 3 and 4b and 5 km from EIA Scoping Boundary for Parts 1a and 4a of the Proposed Development.
Major Accidents and Disasters	5 km from EIA Scoping Boundary.

EIA Topic	Zol Extent
Noise and Vibration	• 300 m from EIA Scoping Boundary for construction and operational noise; • 100 m from EIA Scoping Boundary for construction vibration; and • 50 m of modelled road links.
Socio-economics	• Up to a 60 minute drive time area from EIA Scoping Boundary for economy and employment effects; and • 2 km from EIA Scoping Boundary for other effects (e.g. effects on PRowS, land use impacts and impacts on local and private assets).
Traffic and Transport	• Zol will be established by determining the most probable routes for construction traffic for both the movement of materials and employees once the locations of the construction compounds have been finalised. • In addition, any roads crossed by the Proposed Development (e.g. for the construction of new pipelines) as well as junctions in proximity to such crossings will form part of the transport and traffic Zol. The extent of the assessment will be dependent on the type of construction proposed for such crossings e.g. if road closures will be required for a certain amount of time (then a larger extent may be required due to potential route diversions) or just partial closures.
Waste and Materials	Primary Zol comprises the EIA Scoping Boundary for waste and materials. Secondary Zol covers the local authority administrative boundaries, the Midlands and the UK for material resources.
Water Environment and Food Risk	The Zol for hydrological changes comprises: • The Rivers Tame and Trent; • The whole route of Coventry Canal, Oxford Canal and Grand Union Canal, including hydraulically connected canal arms, within Part 2 of the Proposed Development; • Drayton and Daventry reservoirs within Part 3 of the Proposed Development; • Watercourses crossed by Parts 1b and Part 4b of the Proposed Development; and • Full extent of Water Framework Directive (WFD) groundwater bodies hydraulically connected to the Proposed Development The Zol with respect to groundwater takes account of the WFD groundwater bodies and associated hydraulic connections with and supporting contributions to groundwater abstractions, groundwater discharges, karst landforms (if any), groundwater flood risk areas and groundwater dependent terrestrial ecosystems (GWDTE).

EIA Topic	ZoI Extent
	The ZoI therefore represents the maximum possible extent of any hydrogeological impact of the Proposed Development; however, it does not mean that all receptors identified within the ZoI will be impacted or even considered as part of the impact assessment. The criteria for impact assessment will be developed during the assessment period.

Table 6-7: Search criteria for other developments

Other Development		No. of Housing Units	House Land (Ha)	Non-Residential Floorspace (sqm)	Non-Residential Floorspace (ha)	Distance from EIA Scoping Boundary
Nationally Significant Infrastructure Projects (NSIPs)		N/A	N/A	All	All	5km
Other Strategic Resource Options (SROs)		N/A	N/A	All	All	5km and any other SROs impacting on the same watercourses as the Proposed Development
Transport and Works Act Orders; Mineral and Waste EIA applications; and Transport Allocations in non-statutory plans (e.g. Local Transport Plans)		N/A	N/A	All	All	5km
Town and Country Planning Act 1990 Applications or Allocations within Local Plans	Large Scale Major	≥ 200	> 4	>10,000	> 2.0	5km
	Small Scale Major	10 - 199	0.5 - 4.0	1,000 - 10,000	1.0 - 2.0	1km
	Minor non-householder	1 - 9	< 0.5	< 1,000	< 1.0	500m

Table 6-8: Tier Status Criteria

Tier	Stage	Decreasing level of information likely to be available ↓
1	Under Construction	
	Permitted application(s), whether under the Planning Act 2008 or other regimes, but not yet implemented.	
	Submitted application(s) whether under the Planning Act 2008 or other regimes but not yet determined.	
2	Projects in PINS's Programme of Projects where a scoping report has been submitted.	
3	Projects in PINS's Programme of Projects where a scoping report has not been submitted.	
	Identified in the relevant development plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption) recognising that there will be limited information on the relevant proposals.	
	Identified in other plans and programmes (as appropriate) which set the framework for future developments consents/approvals, where such a development is likely to come forward.	

Stage 2: Establishing a Short List of Other Developments

- 6.9.18 This stage will involve reviewing the long list of other developments to identify those to be taken forward ('shortlisted') into the cumulative assessment.
- 6.9.19 The shortlisting process will involve the application of inclusion/exclusion criteria and will be informed by the professional judgement of the environmental specialists undertaking the EIA and through engagement with the relevant local planning authorities. The criteria for determining which other developments to shortlist to the cumulative effects assessments include considering the temporal overlap of the other developments with the Proposed Development, the level of information available for them and their likelihood to result in cumulative effects with the Proposed Development on the basis of their scale or their potential to become a new receptor for effects from the Proposed Development.
- 6.9.20 Developments and projects that are already in existence, i.e. those which are completed and operational, will be considered to form part of the environmental baseline conditions within which the Proposed Development is implemented.
- 6.9.21 Similarly, where other developments are expected to be completed prior to the construction of the Proposed Development, and where the effects of those projects are fully determined, these will be considered within the future environmental baseline adopted in the EIA.
- 6.9.22 In determining which of the developments should be shortlisted, a minimum level of information is necessary. In accordance with PINS's Advice Note Seventeen, generally only developments with at least an EIA Scoping Report or ES available will be considered for shortlisting.
- 6.9.23 This stage (and the next stages) will be undertaken for the PEIR and ES.

Stage 3: Gathering Information

- 6.9.24 This stage will involve reviewing the available information relating to the shortlisted other developments to establish the details of their likely environmental effects.
- 6.9.25 This considers factors including: the Zol of environmental topics assessed; the planned timescales for construction and operation; and details of their potential or likely significant effects.

Stage 4: Assessment

- 6.9.26 Stage 4 will involve identifying where cumulative effects are likely to occur with the shortlisted other developments and assessing the significance of those effects on environmental receptors and resources, taking into account any mitigation measures. The cumulative effects assessment will use the same significance criteria as adopted for each technical topic chapter (see **Chapters 8 to 22**).

6.10 Indirect, Secondary and Transboundary effects

Indirect and Secondary Effects

- 6.10.1 Indirect and secondary environmental effects are those which are not a direct result of the project, often produced away from the project site or through a complex pathway. An example is that an operational effect of an oilfield development would be oil pumped from the wells. This, subsequently refined offsite as fuel, will lead to carbon emissions when this fuel is eventually burnt, resulting in a secondary effect on climate change that may or may not be significant. The potential for significant indirect and secondary effects will be considered in the EIA and any identified will be reported in the ES.

Transboundary Effects

- 6.10.2 The EIA Regulations require an ES to consider the transboundary effects of a development (paragraph 5 of Schedule 4). Transboundary effects are those that might cross boundaries and affect receptors in neighbouring states, such as the Republic of Ireland or France. However, given the nature of the Proposed Development and its proposed location, significant transboundary effects are unlikely as there are no obvious pathways for effects to occur outside of the United Kingdom.
- 6.10.3 As outlined in the PINS's Advice Note Twelve: 'Transboundary Impacts and Process' (Ref. 10) the screening process for transboundary effects will be carried out by PINS. Information to inform this screening assessment will be provided as part of the DCO application for consent.
- 6.10.4 The Transboundary Effects Screening Matrix is provided in **Appendix 6-2**, in Volume 3 of this EIA Scoping Report.

6.11 Assumptions and Limitations

- 6.11.1 Assumptions and limitations are addressed under each environmental aspect for the Proposed Development, as identified in the appropriate Scoping Report chapters.

6.12 IEMA Quality Mark

- 6.12.1 AECOM holds the IEMA EIA Quality Mark (pictured right) as recognition of the quality of our EIA product and continuous training of our environmental consultants.



- 6.12.2 The IEMA Quality Mark 'checklists' for undertaking EIA and preparation of ESs have been referred to throughout preparation of this ES to ensure that this ES meets the stringent IEMA Quality Mark standards. The 'checklists' cover the following aspects: EIA Regulatory Compliance, EIA Context and Influence, EIA Content and EIA Presentation.
- 6.12.3 A Statement of Competence in accordance with Regulation 14(4)(a) of the EIA Regulations will also be submitted with the ES.

6.13 References

- Ref. 1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 20/03/2025].
- Ref. 2 Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed 20/03/2025].
- Ref. 3 Planning Inspectorate (2017) Advice Note Three: EIA notification and consultation (Version 7). Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-eia-notification-and-consultation> [Accessed 20/03/2025].
- Ref. 4 Planning Inspectorate (2018) Advice Note Nine: Rochdale Envelope, (Version 3). Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope> [Accessed 20/03/2025].
- Ref. 5 Planning Inspectorate (2020) Advice Note Seven: Environmental Impact Assessment: Process Preliminary Environmental Information and Environmental Statements, (Version 7). Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an> [Accessed 20/03/2025].
- Ref. 6 Institute of Environmental Management and Assessment (IEMA) (2017) Delivering Proportionate EIA.
- Ref. 7 IEMA (2024) Implementing the Mitigation Hierarchy from Concept to Construction.
- Ref. 8 Planning Inspectorate (2019) Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects, (Version 2). Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects->

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- Ref. 9 Town and Country Planning Act 1990. Available at:
<https://www.legislation.gov.uk/ukpga/1990/8/contents> [Accessed 20/03/2025].
- Ref. 10 Planning Inspectorate (2020) Advice Note Twelve: Transboundary Impacts and Process, (Version 6). Available at:
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Chapter 7: Other Assessments

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7. Other Assessments

7.1 Introduction

- 7.1.1 The EIA will be undertaken considering other relevant environmental assessments, with a view to avoiding duplication. A summary of other relevant environmental assessments required by various legislation and planning policy is provided below.
- 7.1.2 This chapter is supported by:
- a. The following appendices in Volume 3 of this EIA Scoping Report:
 - i. **Appendix 7-1: Habitats Regulations Screening Report**; and
 - ii. **Appendix 7-2: Water Framework Directive Scoping Report**.

7.2 Habitats Regulations Assessment

- 7.2.1 A Habitats Regulations Assessment (HRA) will be undertaken by the Secretary of State for all protected sites within the national site network that could be impacted by the Proposed Development, including:
- a. Special Areas of Conservation (SAC) and proposed SACs;
 - b. Special Protection Areas (SPA) and proposed SPAs;
 - c. Ramsar sites; and
 - d. Areas secured as sites compensating for damage to European sites.
- 7.2.2 The Applicants will prepare a report to inform the HRA in accordance with the Conservation of Habitats and Species Regulations 2017 (Ref. 1), relevant guidance (Ref. 2, Ref. 3, Ref. 4, Ref. 5) and case law (Ref. 6, Ref. 7). The report to inform the HRA will consider the likely significant effects of the Proposed Development on the conservation objectives of the protected sites. A summary of the protected sites within the Zone of Influence (Zol) of the Proposed Development is provided within **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial** of this EIA Scoping Report.
- 7.2.3 As part of the Regulators' Alliance for Progressing Infrastructure Development (RAPID) process, the Applicants have undertaken assessment of potential impacts on protected sites within the national site network at Gate 2 and at Gate 3. Natural England has been involved in the work to date. The work undertaken for the RAPID process is summarised in a HRA Screening Report included at **Appendix 7-1** (Volume 3 of this EIA Scoping Report) and includes a Likely Significant Effect (LSE) test.

7.3 Water Framework Directive Compliance Assessment

- 7.3.1 A Water Framework Directive (WFD) Compliance Assessment will be undertaken in accordance with the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 8) and relevant guidance (Ref. 9, Ref. 10, Ref. 11). This will consider the extent to which the Proposed Development could impact on the current and future target WFD status of water bodies, including those of the Rivers Tame and Trent.

- 7.3.2 A WFD assessment of the current design iteration of the Proposed Development has been completed at Gate 2 and updated at Gate 3, as part of the RAPID process; these assessments focused on scheme operation. A summary of this work, as well as scoping of construction phase impacts and the proposed scope of further detailed assessment is presented in a WFD Scoping Report included at **Appendix 7-2** (Volume 3 of this EIA Scoping Report).
- 7.3.3 The findings of the WFD assessment will be used to inform the EIA and will aid in the identification of mitigation, as set out within **Chapter 22: Water Environment and Flood Risk** of this EIA Scoping Report. A final WFD Compliance Assessment will be submitted with the DCO application.

7.4 Flood Risk Assessment

- 7.4.1 A Flood Risk Assessment (FRA) will be undertaken to consider the risk of flooding to and from the Proposed Development in accordance with the National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 12), National Planning Policy Framework (NPPF) (Ref. 13) and Planning Practice Guidance (PPG) (Ref. 14).
- 7.4.2 The findings of the FRA will be used to inform the EIA, as set out within **Chapter 22: Water Environment and Flood Risk** of this EIA Scoping Report. The FRA will be appended to the ES.

7.5 Biodiversity Net Gain and Environmental Net Gain

- 7.5.1 Early strategy work to incorporate Biodiversity Net Gain (BNG) within the Proposed Development has been undertaken. As BNG is not an EIA matter, a separate BNG Report, in accordance with the NPSWRI (Ref. 12) and the Environment Act 2021 (Ref. 15), will be prepared for submission with the DCO application. A BNG score for the Proposed Development will be calculated using Defra's statutory biodiversity metric tools and guides (Ref. 16) (or the equivalent available tools at the time of the DCO submission).
- 7.5.2 High-level BNG assessment has been completed for the Proposed Development on the basis of the current design proposals, as part of the RAPID process. This will be developed further and a BNG Report will be submitted with the DCO application.
- 7.5.3 In addition to delivering biodiversity net gain, NPSWRI (Ref. 12) states that *"...developments may also deliver wider environmental gains relevant to the local area, and to national policy priorities, such as reductions in greenhouse gas emissions, reduced flood risk, improvements to air or water quality, or increased access to natural greenspace"*. In accordance with the requirements of the NPS, a statement will be included with the DCO application demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into the design (including any relevant operational aspects) of the Proposed Development.

7.6 Equality Impact Assessment

- 7.6.1 An Equality Impact Assessment (EqIA), which will provide information in terms of groups with protected characteristics under the Equality Act 2010 (Ref. 17) and social inequalities, will be relevant for consideration of vulnerable groups and health inequalities. Equality effects will be considered in a separate EqIA which will be submitted as part of the DCO application if significant impacts are identified at the screening stage.

7.7 Other Permits, Consents and Licenses

- 7.7.1 The principal consent for the construction, operation and maintenance of the Proposed Development will be an order made by the Secretary of State (SoS) for Environment, Food and Rural Affairs for development consent ('the DCO') under section 103 of the Planning Act 2008 (Ref. 17). The DCO consent would, however, need to be supplemented by other permits, consents and licences.
- 7.7.2 The water discharge at Atherstone to the Coventry Canal within Part 1b of the Proposed Development will require a Water Discharge Activity Permit (Ref. 20) and an abstraction licence (Ref. 19) will be required for the abstraction of water from the Grand Union Canal to the abstraction, storage and treatment site within Part 4a of the Proposed Development. These would be sought in parallel to the DCO application process, with the aim that an agreement in principle could be agreed with the Environment Agency, to demonstrate to the SoS that the permits and licences to operate the Proposed Development could be obtained.

7.8 References

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- Ref. 13 Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities & Local Government (MHCLG) (2018 to 2021) and Department for Levelling Up, Housing and Communities (DLUHC) (2025) National Planning Policy Framework – Last updated 7th February 2025. Available at:
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- Ref. 15 Environment Act 2021. Available at:
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Chapter 8: Agriculture and Soils

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8. Agriculture and Soils

8.1 Introduction

- 8.1.1 This chapter presents the scope and methodology for the assessment of potential significant agriculture and soils effects arising from the construction and operation of the Proposed Development.
- 8.1.2 The agriculture and soils assessment interfaces with other EIA topics and should be considered alongside **Chapter 13: Ecology – Terrestrial**, **Chapter 14: Ground Conditions**, and **Chapter 19: Socio-economics** of the EIA Scoping Report.
- 8.1.3 This chapter is also supported by:
 - a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 8-1: Part 1a and Part 1b – Provisional Agricultural Land Classification;**
 - ii. **Figure 8-2: Part 1a and Part 1b – Soilscales;**
 - iii. **Figure 8-3: Part 4a and Part 4b – Provisional Agricultural Land Classification;** and
 - iv. **Figure 8-4: Part 4a and Part 4b – Soilscales.**

8.2 Legislation, Planning Policy Context, and Guidance

- 8.2.1 Legislation, planning policy and guidance relating to agriculture and soils is outlined below.

Legislation

- 8.2.2 The legislation relevant to agriculture and soils assessment includes:
 - a. The Town and Country Planning (Development Management Procedure) (England) Order 2015 (Ref. 1), Schedule 4, Part (y) requires that the local planning authority consults Natural England, if the area of a proposed permanent development exceeds 20 hectares (ha) of Best and Most Versatile (BMV) agricultural land; and
 - b. The Construction (Design and Management) (CDM) Regulations 2015 (Ref. 2) may apply when agricultural soil surveys are conducted alongside other ground investigations.

National Policies, Plans and Strategies

- 8.2.3 The national policies, plans and strategies relevant to the agriculture and soils scope and method of assessment are summarised within **Table 8-1**.

Table 8-1: National policies, plans and strategies – Agriculture and Soils

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resource Infrastructure (NPSWRI) (Ref. 3)	• Paragraph 4.10.3 refers to the protection of BMV land and reiterates the policy set out within the NPPF, summarised below; • Paragraph 4.10.4 refers to the protection of soil resources; • Paragraph 4.10.14 requires for the Applicant to minimise and assess impacts on BMV land and soil resources, and requires for the assessment to be supported by relevant survey information; and • Paragraph 4.10.17 sets out the requirement to specify mitigation for the protection of soils.	• Potential effects on soils and agricultural land are outlined in Section 8.6; • The approach to how these will be assessed is discussed in Section 8.7; and • The approach to mitigation is discussed in Section 8.8.
National Planning Policy Framework (NPPF) (Ref. 4)	• Paragraph 187 sets out protection and enhancement of soils. Recognition of the economic and other benefits of the BMV agricultural land; and • Paragraph 188 provides that where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.	

Local Policy

- 8.2.4 The local policies listed in **Table 8-2** are considered relevant to the scope and method of assessment of potential agriculture and soils impacts presented in this chapter.

Table 8-2: List of relevant local policy – Agriculture and Soils

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: Area specific policies GA5 and GA6.	Ref. 5	Area specific policies GA5 and GA6 require that development will need to consider impacts on soil resources during construction and operation, adhering to Department for Environment Food and Rural Affairs' (Defra) Code of Practice to protect soil (Ref. 26).
	New Local Plan for Birmingham 2042	Ref. 6	No new policies relevant to soils and agricultural land. However, the document will be monitored as it progresses through the Local Plan review process.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: LP 29: Natural landscape.	Ref. 7	Policy LP 29 requires that development will not degrade soil quality and that all development applications that affect the natural environment will be required to provide sufficient information and an assessment of those proposals on the natural assets.
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: - NE4: Managing Flood Risk and Water Quality; and - BE3: Sustainable Design and Construction.	Ref. 8	Policy NE4 seeks measures to reduce soil run-off into watercourses. Policy BE3 requires development proposals to minimise the pollution of environmental receptors including soil.
	Borough Plan Review 2021-2039	Ref. 9	No new policies relevant to soils and agricultural land. However, the document will be monitored as it progresses through the Local Plan review process.
Coventry City Council	Coventry Local Plan (2011-2031)	Ref. 10	Policies do not specify soils but the importance of the green belt and natural environment and recognises the importance of retaining land in agriculture.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Local Plan Review: Issues and Options Consultation (2023).	Ref. 11	No new policies relevant to soils and agricultural land. However, the document will be monitored as it progresses through the Local Plan review process.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: ED4: Wider Urban and Rural Economy.	Ref. 12	Policy ED4 promotes the development and diversification of agriculture and land-based rural businesses but seeks that schemes avoid development on best quality agricultural land.
	Rugby Borough Local Plan review – issues and options consultation (2023).	Ref. 13	No new policies relevant to soils and agricultural land. However, the document will be monitored as it progresses through the Local Plan review process.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: R1 Spatial Strategy for Rural Areas.	Ref. 14	Policy R1 requires that developments within rural areas are appropriate to agricultural development.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: ENV5: Biodiversity.	Ref. 15	Policy ENV5 does not refer to soil but highlights that should a proposal lead to the loss or deterioration of irreplaceable habitats (of which soil is a key component), then development will not be permitted.
	New Local Plan for West Northamptonshire 2041 EC5 Rural Economy.	Ref. 16	Policy EC5 requires that development proposals respect the environmental quality and character of the rural area and protect the BMV agricultural land.
Milton Keynes City Council	Plan: MK 2016 – 2031: DS5 Open Countryside; and	Ref. 17	Policy DS5 recognises that within open countryside development will only be granted if it is essential to agriculture (or other rural interests)

Local authority	Relevant local policy	Reference	Relevance to the assessment
	NE7: Protection of Best and Most Versatile Agricultural Land.		NE7 requires that development involving the loss of agricultural land should seek to use areas of poorer quality land (grades 3b, 4 and 5 of the Agricultural Land Classification [ALC]) in preference to that of a higher quality unless other sustainability considerations suggest otherwise.
	New City Plan: Ambition and Objectives Consultation 2023	Ref. 18	No new policies relevant to soils and agricultural land. However, the document will be monitored as it progresses through the Local Plan review process.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: NE7 Best and Most Versatile Agricultural Land.	Ref. 19	NE7 requires that proposals involving development of agricultural land shall be accompanied by an assessment identifying the Grades (1 to 5) of ALC. Where development involving BMV agricultural land (Grades 1, 2 and 3a) is proposed, those areas within the EIA Scoping Boundary should be preferentially used as green open space and built structures avoided.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives	Ref. 20	No new policies relevant to soils and agricultural land. However, the document will be monitored as it progresses through the Local Plan review process.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: - CC8 Pollution and Land Instability; and - DC5 Agricultural Land.	Ref. 21	Policy CC8 requires that all development proposals have regard to guidance in relation to pollution, including to soil. Policy DC5 states that development proposals which would result in the significant loss of Grades 2 and 3a agricultural land will only be permitted where it can be demonstrated that the location of the proposed development is necessary in order to provide a scheme that is of valuable public benefit and overrides the need to protect land. Any development within these areas will need to be supported by an ALC assessment.

Guidance and Standards

- 8.2.5 Relevant guidance and standards which have been used as part of the scoping process are listed below and will also be taken into account as part of the EIA:
- a. Institute of Environmental Management and Assessment (IEMA) published the first guidance for the consideration of the impacts of development on soils and land in EIA: A New Perspective on Land and Soil in Environment Impact Assessment (the 'IEMA guidance') (Ref. 22);
 - b. The Ministry of Agriculture, Fisheries and Food's (MAFF's) Agricultural Land Classification (ALC) of England and Wales Revised guidelines and criteria for grading the quality of agricultural land (Ref. 23) provides the current guidelines and criteria for grading the quality of agricultural land in England and Wales;
 - c. Natural England's Guide to Assessing Development Proposals on Agricultural Land (2021) (Ref. 24). The guidance also summarises the required survey methodology (also presented in Natural England's 2012 Technical Information Note 049 (TIN049) (Ref. 25);
 - d. Defra's Construction Code of Practice for the Sustainable Use of Soil on Development Sites (Ref. 26) provides technical guidance on the handling, storage and (re) use of soil within construction projects;
 - e. The Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings (Ref. 27) contains information that is applicable to soils outside of mineral workings, containing details of good practice methods for stripping, handling, storage, reinstatement and management of soil resources. This guidance updates and replaces the MAFF's Good Practice Guide for Handling Soils (2000); and
 - f. The British Society of Soil Science (BSSS) Guidance Document 3: Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (2021) (Ref. 28).

8.3 Consultation

- 8.3.1 During non-statutory consultation, concerns were raised regarding potential impacts of pipeline construction on agricultural land. Such impacts are included within the scope of the assessment. Natural England is a statutory consultee for developments leading to the permanent loss of more than 20 ha of BMV land. Whilst the area of both Part 4a options (Sites B and H) exceeds 40ha in size, the permanent land take of BMV land is not anticipated to exceed 20 ha. This will be subject to field survey and consultation obligations will be met.
- 8.3.2 These topics will be addressed accordingly in the next stage of EIA at PEIR and ES.
- 8.3.3 Furthermore, as part of the EIA process, consultation will be undertaken with the local planning authorities and Natural England to inform the assessment

and mitigation of temporary effects on BMV land for the Proposed Development.

8.4 Study Area

- 8.4.1 Parts 2 and 3 of the Proposed Development would principally comprise non-agricultural land. Only a limited amount of non-agricultural soil resource may be impacted. Any impacts on the soil resource within these areas would be mitigated through standard construction practices and as such, Parts 2 and 3 of the Proposed Development are scoped out of further assessment and the study area for the agriculture and soils assessment.
- 8.4.2 Part 1a includes land identified within provisional ALC mapping as agricultural (presented in **Table 8-3** below and in **Figure 8-1** in Volume 2 of this EIA Scoping Report). The allocation of both agricultural and non-agricultural categories demonstrates the limitations of the resolution of provisional ALC mapping. It is evident from aerial imagery that the entire Part 1a EIA Scoping Boundary is non-agricultural. Furthermore, this land is owned by Severn Trent and is not used for agricultural purposes. As such, Part 1a has also been scoped out of further assessment and does not form part of the study area for the agriculture and soils assessment.

Table 8-3: ALC grades for Part 1a: Minworth AWTP

Provisional ALC grade	Area (ha)
Grade 3	10.8
Non-agricultural	18.3
Total	29.2*

**Note the parts do not add up to the total due to rounding.*

- 8.4.3 Potential impacts from the Proposed Development on soils and agricultural land will be confined to the EIA Scoping Boundary where construction and operational activities would take place for Parts 1b, 4a and 4b of the Proposed Development. No buffer is applied as the impacts to soils and agricultural land only occur on the land that is directly impacted by the Proposed Development.
- 8.4.4 The cumulative effects assessment with other developments will consider an extended 250 m study area from the EIA Scoping Boundary.

8.5 Baseline Conditions

Existing Baseline

- 8.5.1 This section provides a summary of the baseline conditions in respect of soils and agricultural land within the study area. In preparation of this section of the EIA Scoping Report, National Soil Map of England and Wales (NATMAP) Vector data was purchased from LandIS. LandIS is the Land Information System, and is a substantial environmental information system operated by Cranfield University, UK, designed to contain soil and soil-related information. NATMAP is the most detailed available soils mapping covering England and Wales and is based upon survey data from the Soil Survey of England and Wales, it provides soil association data at a

1:250,000 scale. The NATMAP data are presented in **Figure 8-2** for Part 1 and in **Figure 8-4** for Part 4 in Volume 2 of this EIA Scoping Report.

8.5.2 Additionally, the following sources of information were studied:

- a. Multi-Agency Geographical Information for the Countryside (MAGIC). (Ref. 29);
- b. LandIS Soils Guide (Ref. 30);
- c. Provisional ALC 1:250,000 mapping (1993) (Ref. 31 and Ref. 32); and
- d. Aerial photography from Google Earth Pro.

8.5.3 ALC (Ref. 23) is the standard method for classifying the quality of agricultural land in England and Wales. Land is assessed according to its versatility, productivity and workability, based upon inter-related parameters including climate, relief, soil characteristics and drainage. These factors form the basis for classifying agricultural land into one of five grades (with Grade 3 land divided into Subgrades 3a and 3b), ranked from excellent (Grade 1) to very poor (Grade 5). Grades 1, 2 and Subgrade 3a represent BMV land.

8.5.4 There are no detailed published ALC survey reports or mapping available on MAGIC within the EIA Scoping Boundary for Parts 1b, 4a and 4b of the Proposed Development (Ref. 29). The most detailed published ALC data covering the EIA Scoping Boundary are the 1:250,000 scale Provisional ALC mapping (Ref. 31 and Ref. 32). The scale of the mapping is not accurate at the field level as it generally does not pick up variations in ALC grade for areas less than approximately 80 ha. Additionally, it does not provide a subdivision of Grade 3 land into Subgrade 3a (good quality, BMV) and Subgrade 3b (moderate quality, non-BMV), and the Grade 3 land must therefore be considered as having the potential to be of BMV quality.

8.5.5 Analysis of provisional ALC grades is tabulated for Part 1b, Part 4a and Part 4b. Sectional options for the pipeline within Part 4b are expressed independently, resulting in an area of overlap with the adjacent length of pipeline. The tables of approximate ALC grades within the EIA Scoping Boundary, are provided in **Table 8-4** to **Table 8-8**. The information is illustrated for Part 1b in **Figure 8-1** and for Part 4 in **Figure 8-3** in Volume 2 of this EIA Scoping Report.

Table 8-4: ALC grades for Part 1b

Provisional ALC grade	Approximate Area (ha)
Grade 2	89.2
Grade 3	166.1
Grade 4	15.5
Non-agricultural	29.9
Urban	9.5
Total	310.2

Table 8-5: ALC grades for Site B and Site H of Part 4a

Provisional ALC grade	Site B	Site H
	Approximate Area (ha)	Approximate Area (ha)
Grade 2	0	0
Grade 3	43.8	42.3
Grade 4	2.9	0
Non-agricultural	0	0
Total	46.7	42.3

Table 8-6: ALC grades for options SP2, SP2A and SP2B of Part 4b

Provisional ALC grade	Option SP2	Option SP2A	Option SP2B
	Approximate Area (ha)	Approximate Area (ha)	Approximate Area (ha)
Grade 2	0	0	0
Grade 3	244.7	42.1	60.1
Grade 4	64.8	60.1	0
Non-agricultural	21.0	1.0	0
Total	330.5	103.2	60.1

Table 8-7: ALC grades for options SP5, SP6 and SP7 of Part 4b

Provisional ALC grade	Option SP5	Option SP6	Option SP7
	Approximate Area (ha)	Approximate Area (ha)	Approximate Area (ha)
Grade 2	18.1	0	0
Grade 3	79.4	14.1	36.0
Grade 4	55.7	48.3	0.3
Non-agricultural	3.8	0	0
Total	157.0	62.4	36.3

Table 8-8: ALC grades for options SP10, SP10A and SP10B of Part 4b

Provisional ALC grade	Option SP10	Option SP10A	Option SP10B
	Approximate Area (ha)	Approximate Area (ha)	Approximate Area (ha)
Grade 2	28.8	0	0
Grade 3	180.7	21.5	32.6
Grade 4	0	0	0
Non-agricultural	13.2	22.3	0

Provisional ALC grade	Option SP10	Option SP10A	Option SP10B
	Approximate Area (ha)	Approximate Area (ha)	Approximate Area (ha)
Total	222.7	43.8	32.6

- 8.5.6 Simple descriptors of the soil associations present within Parts 1b, 4a and 4b are provided in **Table 8-9** to **Table 8-20**. The spatial information is illustrated for Part 1b in **Figure 8-2** and for Part 4 in **Figure 8-4** in Volume 2 of this EIA Scoping Report.

Table 8-9: Soil Associations within Part 1b

Name	Description	Approximate Area (ha)
MIDELNEY	Stoneless clayey soils mostly overlying peat.	17.1
ARROW	Deep permeable coarse loamy soils affected by groundwater.	77.7
OXPASTURE	Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	13.0
BARDSEY	Slowly permeable seasonally waterlogged loamy over clayey and fine silty soils over soft rock.	24.9
BROMSGROVE	Well drained reddish coarse loamy soils mainly over soft sandstone but deep in places.	35.6
BROCKHURST1	Slowly permeable seasonally waterlogged reddish fine loamy over clayey soils.	29.0
WHIMPLE2	Reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	51.8
COMPTON	Stoneless mostly reddish clayey soils affected by groundwater.	20.1
WHIMPLE3	Reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	14.6
RUFFORD	Slowly permeable seasonally waterlogged reddish coarse loamy over clayey soils.	1.3
EARDISTON2	Well drained often reddish coarse loamy soils over sandstone.	7.0
POWYS	Shallow well drained loamy soils over rock.	15.1
NEUTRAL RST OPENCAST	Restored opencast coal workings. Slowly permeable seasonally	3.1

Name	Description	Approximate Area (ha)
	waterlogged compacted fine loamy and clayey disturbed soils. Often stony with thin topsoils.	
Total		310.3

Table 8-10: Soil Associations within option Site B of Part 4a

Name	Description	Approximate Area (ha)
BISHAMPTON2	Deep fine loamy and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging	11.5
OXPASTURE	Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	32.4
FLADBURY1	Stoneless clayey soils, in places calcareous variably affected by groundwater.	2.8
Total		46.7

Table 8-11: Soil Associations within option Site H of Part 4a

Name	Description	Approximate Area (ha)
EVESHAM	Slowly permeable calcareous clayey soils.	42.3

Table 8-12: Soil Associations within option SP2 of Part 4b

Name	Description	Approximate Area (ha)
BLOCK	Moderately permeable calcareous loamy soils over chalky gravel variably affected by groundwater.	15.0
HANSLOPE	Slowly permeable calcareous clayey soils.	63.8
FRILFORD	Deep well drained sandy and coarse loamy soils.	25.6
EVESHAM3	Slowly permeable calcareous clayey, and fine loamy over clayey soils.	120.0
RAGDALE	Slowly permeable seasonally waterlogged clayey and fine loamy over clayey soils.	63.1
FLADBURY1	Stoneless clayey soils, in places calcareous variably affected by groundwater.	6.6

Name	Description	Approximate Area (ha)
OXPASTURE	Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	33.9
BEARSTED1	Well drained coarse loamy and sandy soils over sand or sandstone, in places ferruginous.	1.9
Open water	Lake	0.5
Total		330.4

Table 8-13: Soil Associations within option SP2A of Part 4b

Name	Description	Approximate Area (ha)
FRILFORD	Deep well drained sandy and coarse loamy soils.	32.0
RAGDALE	Slowly permeable seasonally waterlogged clayey and fine loamy over clayey soils.	52.4
OXPASTURE	Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	18.5
Open water	Lake	0.2
Total		103.1

Table 8-14: Soil Associations within option SP2B of Part 4b

Name	Description	Approximate Area (ha)
EVESHAM3	Slowly permeable calcareous clayey, and fine loamy over clayey soils.	29.6
HANSLOPE	Slowly permeable calcareous clayey soils.	30.5
Total		60.1

Table 8-15: Soil Associations within option SP5 of Part 4b

Name	Description	Approximate Area (ha)
BLOCK	Moderately permeable calcareous loamy soils over chalky gravel variably affected by groundwater.	36.3
WANTAGE	Well drained calcareous silty soils, in places shallow over argillaceous chalk.	40.5
ANDOVER1	Shallow well drained calcareous silty soils over chalk on slopes and crests.	18.0

Name	Description	Approximate Area (ha)
GROVE	Moderately permeable fine loamy calcareous soils over chalky gravel affected by groundwater.	19.4
UPTON1	Shallow well drained calcareous silty soils over chalk. Mainly on moderately steep, sometimes very steep land.	13.2
EVESHAM2	Slowly permeable calcareous clayey soils.	19.8
FLADBURY1	Stoneless clayey soils, in places calcareous variably affected by groundwater.	9.9
Total		157.1

Table 8-16: Soil Associations within option SP6 of Part 4b

Name	Description	Approximate Area (ha)
EVESHAM2	Slowly permeable calcareous clayey soils.	8.0
EVESHAM3	Slowly permeable calcareous clayey, and fine loamy over clayey soils.	6.4
FLADBURY1	Stoneless clayey soils, in places calcareous variably affected by groundwater.	48.0
Total		62.4

Table 8-17: Soil Associations within option SP7 of Part 4b

Name	Description	Approximate Area (ha)
BLOCK	Moderately permeable calcareous loamy soils over chalky gravel variably affected by groundwater.	0.4
EVESHAM3	Slowly permeable calcareous clayey, and fine loamy over clayey soils.	30.5
FLADBURY1	Stoneless clayey soils, in places calcareous variably affected by groundwater.	5.4
Total		36.3

Table 8-18: Soil Associations within option SP10 of Part 4b

Name	Description	Approximate Area (ha)
BLOCK	Moderately permeable calcareous loamy soils over chalky gravel variably affected by groundwater.	56.0
WANTAGE1	Well drained calcareous silty soils, in places shallow over argillaceous chalk.	5.8
UPTON1	Shallow well drained calcareous silty soils over chalk. Mainly on moderately steep, sometimes very steep land.	20.5
BATCOMBE	Fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal water logging.	108.4
COOMBE1	Well drained calcareous fine silty soils deep in valley bottoms,	28.1
EVESHAM3	Slowly permeable calcareous clayey, and fine loamy over clayey soils.	3.8
Total		222.6

Table 8-19: Soil Associations within option SP10A of Part 4b

Name	Description	Approximate Area (ha)
UPTON1	Shallow well drained calcareous silty soils over chalk. Mainly on moderately steep, sometimes very steep land.	14.3
BATCOMBE	Fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal water logging.	29.5
Total		43.8

Table 8-20: Soil Associations within option SP10B of Part 4b

Name	Description	Approximate Area (ha)
BATCOMBE	Fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal water logging.	32.6

Future Baseline

- 8.5.7 Potential changes to the baseline conditions for agriculture and soils may occur over the lifespan of the Proposed Development due to climate change. The rate and implications of change cannot be reliably modelled at the field scale. Farmers regularly review their crop rotation, crop choice and seed type; shifting climatic patterns will be one part of these business decisions. Therefore, for the purposes of the EIA, the future baseline is assumed to be unchanged.

8.6 Potential Effects

8.6.1 The assessment will consider the following potential effects within the EIA Scoping Boundary:

- a. Impacts on ALC agricultural land including the loss of BMV land;
- b. Potential for disturbance/damage or improvement through changes in land management; and
- c. Loss of soil resources (including biosecurity).

8.6.2 Disturbance may result in the impairment of soil function, quality and resilience. This effect would comprise changes such as:

- a. Compaction and smearing (damage to soil structure);
- b. Conditions within the soil profile conducive to excessive drying or wetness;
- c. Mixing of distinct soil horizons (e.g. topsoil with subsoil) reducing their potential reuse;
- d. Damage or removal of vegetation layer;
- e. Changes in the soil profile stone content;
- f. Loss of nutrients (e.g. nitrogen), biota (e.g. bacteria, fungi, earthworms) and reduction in soil fertility; and
- g. Loss of ecosystem services, such as the ability of the soil to support food production and habitat creation.

8.6.3 The inappropriate removal, handling and storage of soil resources during construction activities may also render them unsuitable for reuse in site restoration and, therefore, constitutes a loss of soil resource (e.g. the mixing of topsoil and subsoil; the mixing of soils of differing textures, or the mixing of soils with non-soil substrate or other unsuitable materials) as this mixing cannot be reversed nor the constituent materials returned to their original state. Incorrect handling leading to mixing and loss of suitability is considered the greatest risk to soil retention.

8.6.4 During large-scale projects such as the Proposed Development, there is the potential for disease and pathogen transfer between different areas of agricultural land (i.e., a biosecurity risk). This is considered in the loss of soil resource as the main cause of potential disease and pathogen transfer and is the transfer of soil from infected to uninfected areas via vehicles, plant and machinery. Details of biosecurity risks presented by Invasive Non-Native Species are provided within **Chapter 13: Ecology – Terrestrial**.

8.6.5 The potential effects from the Proposed Development are presented within **Table 8-21**, which summarises the rationale for scoping in the construction effects on soils and agriculture of Parts 1b, 4a and 4b and scoping out the operational effects.

Table 8-21: Potential effects– Soils and Agricultural Land

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Phase	Rationale
Loss and disturbance of soil resources related to agricultural land may occur <i>in situ</i> , for example through trafficking by vehicles or through soil removal, handling, storage and subsequent reinstatement, which may result in the impairment of soil function, quality or resilience.	In	Parts 1b, 4a and 4b	Construction	Part 4a would require permanent removal of soil function for agriculture. The significance of this loss would reflect ALC grade and soil type and would follow IEMA guidelines (Ref. 22). There would be temporary disturbance to soils and agricultural land during the construction phase of Parts 1b and 4b from: • Stripping and stockpiling of topsoil and subsoil, storage and reinstatement; • Ground excavation; • Trenchless drilling (e.g. Horizontal Directional Drilling [HDD]); • Stockpiling materials; and • Vehicle movements onsite. As such, this aspect is scoped into the EIA.
	Out		Operation	There will be no disturbance of soils and agricultural land once the Proposed Development is complete and operational. Any maintenance or repair works would be ad hoc and limited and managed in accordance with standard industry practice. As such, this potential effect is scoped out of the EIA. Geo-environmental considerations relating to non-agricultural soils are provided within Chapter 14: Ground Conditions.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Phase	Rationale
	n/a	Parts 1a, 2 and 3	Construction / Operation	No agricultural land is required for these parts of the Proposed Development. Geo-environmental considerations relating to non-agricultural soils are provided within Chapter 14: Ground Conditions . As such, Parts 1a, 2 and 3 are scoped out of the agriculture and soils assessment.
Impacts on agricultural land through restriction to agricultural function within the farm holding.	Out	Parts 1b, 4a and 4b	Construction / Operation	The restriction to agricultural function from permanent and temporary use of farmland is a potential socio-economic impact and is captured in Chapter 19: Socio-Economics . Geo-environmental considerations relating to non-agricultural soils are provided within Chapter 14: Ground Conditions . As such, Parts 1b, 4a and 3 are scoped out of further assessment.
	n/a	Parts 1a, 2 and 3	Construction / Operation	No agricultural land is required for these parts of the Proposed Development. Geo-environmental considerations relating to non-agricultural soils are provided within Chapter 14: Ground Conditions . As such, Parts 1a, 2 and 3 are scoped out of further assessment.

8.7 Approach to Assessment

Establishing Baseline Conditions

- 8.7.1 A survey of soils to provide ALC information will be undertaken for Part 4a following standard Natural England guidelines (Ref. 23) and using suitably qualified and experienced soil scientists. It is proposed to define the baseline conditions for soils and ALC grading within Parts 1b and 4b with desktop information until the pipeline routes, within the corridors, are established. For the EIA, soils and ALC survey will be undertaken following the same Natural England guidelines. Surveys will be at an approximate density of one inspection per ha, including one soil pit for each soil type identified.
- 8.7.2 Within Parts 1b and 4b, the value of ALC and related soil survey data is principally to establish baseline data, in order that temporarily disturbed soils may be reinstated to their original condition, and to accurately consider any impacts on BMV land. Undertaking surveys for Parts 1b and 4b once the detailed design is known would allow the survey to focus on the actual area of proposed works. This allows for a more focussed characterisation of the baseline conditions of the pipeline route rather than the full EIA Scoping Boundary, which provides a degree of flexibility for the final alignment of the pipeline route.

Assessment Methodology

- 8.7.3 IEMA guidance document 'A New Perspective on Land and Soil in Environmental Impact Assessment' (Ref. 22) advocates a wider approach to assessing the soil functions, ecosystem services and natural capital provided by land and soils. It does not include a definitive methodology, nonetheless, it establishes sensitivity of receptors and proposes thresholds for impact magnitude, which are discussed from paragraph 8.7.5. The proposed assessment methodology is therefore based on determining the sensitivity of receptors and magnitude of impacts in order to derive a conclusion on the significance of effects, as set out within sections below.

Assessment Criteria

- 8.7.4 Definitions of magnitude of impact, sensitivity or importance of the receptor and significance of effect are derived from IEMA guidelines and will be used in the Preliminary Environmental Information Report (PEIR) and in more detail in the Environmental Statement (ES).

Sensitivity of Receptors

- 8.7.5 The criteria for assessing receptor sensitivity are defined in **Table 8-23**. The sensitivity of receptors may be related directly to ALC grading and this is most appropriate for permanent land use change. The IEMA guidelines also quantify elements to develop sensitivity criteria based on Field Capacity Days (FCD), which is when large soil pores are filled with water, and/or Wetness Class. Wetness classes are related to the periodicity of water in the rooting zone and is derived from a combination of soil texture, structure and the relationship with climate. These sensitivity criteria are most appropriate in relation to temporary effects and the development of soil management approaches to prevent soil degradation.

Table 8-22: Receptor sensitivity of soils in relation to habitat designation and ALC

High	Medium	Low	Negligible
Soils directly supporting a designated site of international importance (e.g. SAC, SPA, Ramsar).	Soils directly supporting a designated site of national importance (e.g. SSSI).	Soils supporting non-statutory designated sites (e.g. Local Wildlife Site (LWS), Local Nature Reserve (LNR), LGS, Sites of Nature Conservation Importance (SNCI)).	Soils supporting non-designated notable or priority habitats. Previously developed land formerly in 'hard uses' with little potential to return to agriculture
ALC grade 1 & 2	ALC Subgrade 3a	ALC Subgrade 3b	ALC Grade 4 & 5

Table 8-23: Receptor sensitivity of soil resources

Soil Resources	High	Medium	Low	Negligible
Soils with high clay and silt fractions	Field Capacity Days (FCD) greater than or equal to 150	FCD less than 150	n/a	n/a
Medium-textured soils	FCD greater than or equal to 225	FCD less than 225	n/a	n/a
Soils with high sand fraction	n/a	n/a	FCD less than 225	n/a
Soil wetness class	Class V or VI	Class III and IV	Class I and II	n/a

Magnitude of Impact

- 8.7.6 The threshold areas within the IEMA guidelines (Ref. 22) are primarily for permanent sealing of land or land quality downgrading and are presented in **Table 8-24**. Further professional judgement, with explanation, will be provided in the ES if moderation of these thresholds is adopted.
- 8.7.7 Where temporary works are undertaken, all soil resources will be retained within the EIA Scoping Boundary and not exported for reuse elsewhere.

Table 8-24: Magnitude of Impacts

	Large	Moderate	Small	Negligible
Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading) and / or restriction to agricultural function	Greater than 20 ha	Between 5 and 20 ha	Less than 5ha	No discernible loss

Assessment of Effects and Level of Significance

- 8.7.8 The classification and likely significance of the effect resulting from the magnitude of impact and receptor sensitivity will be evaluated in accordance with the matrix shown in **Table 6-4** in **Chapter 6: EIA Approach**.
- 8.7.9 Moderate and major effects are considered significant, minor and negligible effects are considered not significant. Descriptions of how the magnitudes of effects may be interpreted are provided in **Table 6-5** in **Chapter 6: EIA Approach**.

Assumptions, Limitations, and Uncertainties

- 8.7.10 The assessment will assume that during the construction phase, excavation / earthworks / cutting may be required anywhere within the EIA Scoping Boundary (worst-case situation).

8.8 Approach to Mitigation

- 8.8.1 Based on the assessment of the baseline conditions and the identification of any potential impacts, recommendations for / commitments to mitigation measures will be made, where relevant, in the ES.
- 8.8.2 Where impacts cannot be avoided, measures will be taken to minimise impacts on the surrounding land and farming operations, through consultation with landowners and tenants. An Outline Soil Management Plan (SMP) would be submitted with the DCO application for the Proposed Development to set out measures to be employed by contractors, so that the soil resource within the EIA Scoping Boundary is not lost as a result of the works associated with the Proposed Development.

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Chapter 9: Air Quality and Odour

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9. Air Quality and Odour

9.1 Introduction

- 9.1.1 This chapter presents the scope and methodology for the assessment of potential significant effects arising from the construction and operation of the Proposed Development on air quality and odour.
- 9.1.2 The chapter considers emissions of air pollutants on human health, public amenity, designated ecological sites and designated local air quality management areas. These emissions include fugitive particulate matter (dust, PM₁₀ and PM_{2.5} size fractions), odour from construction or maintenance works during the operational phase and the emissions of oxides of nitrogen (Nox) and nitrogen dioxide (NO₂) and particulate matter from road vehicles movements associated with the construction and operation of the Proposed Development.

9.2 Legislation, Planning Policy Context, and Guidance

- 9.2.1 Legislation, planning policy and guidance relating to air quality and odour is outlined below.

Legislation

- 9.2.2 The applicable legislation includes:
- Environmental Protection Act 1990 (Ref. 1);
 - Environment Act 1995 (Ref. 2);
 - Environment Act 2021 (Ref. 3);
 - The Air Quality (England) Regulations 2000 (Ref. 4), as amended by the Air Quality (England) (Amendment) Regulations 2002 (Ref. 5);
 - The Air Quality Standards Regulations 2016 (Ref. 6);
 - National air quality legislation originating from the European Union (EU) (Ref. 7); and
 - The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Ref. 8).

National Policies, Plans and Strategies

- 9.2.3 The relevant national policies, plans and strategies for Air Quality and Odour are summarised below and within **Table 9-1**. These documents have informed the assessment methodology, identification of sensitive receptors and study area.

Table 9-1: National policies, plans and strategies – Air Quality and Odour

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 11)	Air Quality: Paragraphs 4.2.3 to 4.2.14 'Setting our requirements for the Applicant's air quality assessment and mitigation'.	The policy sets out requirements for methodology, including assessment criteria, the use of Defra air quality projections in the baseline assessment and appropriate mitigation. The policy explicitly states that the air quality effects of the Proposed Development on wildlife and biodiversity should be assessed in accordance with the Biodiversity and Nature Conservation Section 4.3 of the NPSWRI.
	Common law nuisance and statutory nuisance: Paragraphs 3.9.1 to 3.9.3 setting out matters for consideration.	All matters relating to common law nuisance or statutory nuisance may be relevant to the consideration of emissions of air pollutants and odorous substances (smell).
National Planning Policy Framework (NPPF) (Ref. 12)	Paragraphs 174 and 186 identify the requirement to take air pollution into account.	Identifies national air quality objectives and limit values as relevant assessment criteria and highlights the need to consider if any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan, if there is one.
Air Quality Strategy (AQS) 2023 (Ref. 9)	The Air Quality Strategy framework for local authority delivery was revised in 2023 (Ref. 9) and supersedes AQS: Volume 1 (Ref. 10) in England only. The AQS (Ref. 9) sets out the actions that the Department for Environment, Food and Rural Affairs (Defra) expects local authorities to take in support of the long-term air quality goals. It provides a framework to enable local authorities to make best use of their powers and make improvements for their communities.	The AQS summarises the air quality objectives established through legislation set out in paragraph 9.2.2. The air quality objectives for England, for the pollutants of relevance to this assessment are displayed in Table 9-2 .

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	Local authorities have a duty to address exceedances of air quality objectives in their area, including declaring Air Quality Management Areas (AQMAs) and publishing Air Quality Action Plans (AQAPs) setting out the measures they will take with the aim of achieving ongoing compliance. The AQS summarises current objectives and targets but does not define them.	

Table 9-2: Key Air quality Strategy Objectives

Pollutant	Objective ($\mu\text{g}/\text{m}^3$)*	Averaging Period	Maximum Permitted Exceedances
Nitrogen Dioxide (NO_2)	200 $\mu\text{g}/\text{m}^3$	1 hour	18 times per year (i.e. 99.79 th percentile)
	40 $\mu\text{g}/\text{m}^3$	Annual	-
Particulate Matter (PM_{10})	40 $\mu\text{g}/\text{m}^3$	Annual	-
	50 $\mu\text{g}/\text{m}^3$	24 Hour	35 times per year (i.e. 90.4 th percentile)
Particulate Matter ($\text{PM}_{2.5}$)	20 $\mu\text{g}/\text{m}^3$	Annual	-

* $\mu\text{g}/\text{m}^3$ = micrograms per cubic metre

Local Policy

- 9.2.5 The local policies listed in **Table 9-3** are considered relevant to the scope and method of assessment of potential air quality and odour impacts presented in this chapter.

Table 9-3: List of relevant local policy – Air Quality and Odour

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • Policy TP37 – Health; and • Policy TP38 – A sustainable transport network.	Ref. 13	Policy TP37 – The City Council's commitment to reducing health inequalities, increasing life expectancy and improving quality of life by seeking to improve air quality and reduce noise within the city. Policy TP38 – The policy seeks to promote the use of modes of transport that improve air quality and addresses existing air quality problems.
	Birmingham City Council Air Quality Action Plan: • Action 6: Develop Policies to Support Better Air Quality.	Ref. 14	The Policy describes how a new development will be required to implement or support actions that make a positive contribution to improving air quality. It is the aim of the policy to implement a system to reduce emissions from construction, by reducing emissions of dust and particulate matter from construction and demolition activities and manage emissions of NO _x from construction and demolition machinery by way of controls through the planning system on Non-Road Mobile Machinery (NRM).
	New Local Plan for Birmingham 2042	Ref. 15	No new policies for air quality and odour identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • Policy LP29 – Development Considerations.	Ref. 16	The Policy builds on NPPF requirements, by requiring development to avoid and address unacceptable impacts upon neighbouring amenities through air quality or other pollution.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Air Quality Supplementary Planning Document.	Ref. 17	The document sets out guidance and requirements for air quality assessments for new developments. The suggested approach is consistent with the good practice methods proposed in this scoping document.
Warwickshire County Council	None specific to air quality or odour.	-	N/A
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: Policy HS2 - Strategic accessibility and sustainable transport highlights an air quality action plan that forms an appendix to the Warwickshire County Council Local Transport Plan 2011-2026.	Ref. 18	Transport proposals in line with those identified in the Coventry and Warwickshire Local Transport Plan (Ref. 19). The policy identifies a need for development proposals to consider how they accord with the Air Quality supplementary planning documents.
	Nuneaton and Bedworth Borough Council Supplementary Planning Document: Air Quality.	Ref. 19	The document sets out guidance and requirements for air quality assessments for new developments. The suggested approach is consistent with the good practice methods proposed in this scoping document.
	Nuneaton and Bedworth Air Quality Action Plan 2022.	Ref. 21	The Plan outlines the actions that the Borough Council will take to improve air quality in Nuneaton and Bedworth until the NO ₂ air quality objective is achieved, such as encouraging active travel, by reducing travel demand, encouraging freight onto different modes, or increasing the use of non-diesel and petrol vehicles. These measures will inform proposed mitigation for the Proposed Development.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Borough Plan Review 2021-2039.	Ref. 22	No new policies for air quality and odour identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Coventry City Council	Coventry Local Plan (2011-2031): Policy EM7: Air Quality describes the approach to assessment of air quality impacts and links to the West Midlands Transport Emissions Framework and associated policies aimed at promoting sustainable low emission transport.	Ref. 23	The action plan focuses on the use of the national air quality objective as the key assessment metric for local air quality management and the importance of effectiveness of mitigation measures in supporting the ongoing achievement of the objective values.
	Air Quality Supplementary Planning Document.	Ref. 24	The document sets out guidance and requirements for air quality assessments for new developments. The suggested approach is consistent with the good practice methods proposed in this scoping document.
	Local Plan Review: Issues and Options Consultation (2023).	Ref. 25	No new policies for air quality and odour identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: Policy HS5: Traffic Generation and Air Quality, Noise and Vibration describes the authorities approach to minimising air quality impact through the use of sustainable transport modes.	Ref. 26	Informs potential mitigation options for transport related emissions.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Rugby Borough Council Air Quality Supplementary Planning Document.	Ref. 27	Includes supplementary guidance for the implementation of Policy HS5 and the mitigation requirements for new developments.
	Rugby Borough Local Plan review – issues and options consultation (2023).	Ref. 28	No new policies for air quality and odour identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: Policy BN9 – Planning for Pollution Control relates to the need to maintain and improve air quality in accordance with national air quality standards.	Ref. 29	The policy relates to the good practice approach of designing out air quality impacts where possible and providing proportionate mitigation if required.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: Policy HO2 – Daventry, Micklewell Park Extension relates to a site adjacent to the Proposed Development that would introduce air quality sensitive receptors.	Ref. 30	The planned redevelopment of an area introducing new future receptors into the study area.
	New Local Plan for West Northamptonshire 2041: Policy PL2 – Air Quality.	Ref. 31	The policy relates to the good practice approach of designing out air quality impacts where possible and providing proportionate mitigation if required.

Local authority	Relevant local policy	Reference	Relevance to the assessment
Milton Keynes City Council	Plan: MK 2016 – 2031: Policy EH7 – Promoting Healthy Communities.	Ref. 32	Milton Keynes Council is committed to reducing health inequalities, increasing life expectancy and improving quality of life of the borough. Proposals should be designed to achieve the aspiration below: Seeking to improve air quality and reduce noise by locating and designing pollution generating land uses and roads to avoid adverse impacts on sensitive land uses and securing necessary mitigation measures to make development acceptable.
	Plan: MK 2016 – 2031: Policy NE6 – Environmental Pollution describes a good practice approach to air quality impact assessment and highlights the role of management plans to manage odour and air quality impacts.	Ref. 32	The policy relates to the assessment methodology and approaches to mitigation of air quality and odour impacts.
	New City Plan: Ambition and Objectives Consultation 2023.	Ref. 33	No new policies for air quality and odour identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Buckinghamshire Council	Aylesbury Vale Local Plan 2013-2033: Policy NE5 – Pollution, air quality and contaminated land describes how air quality impacts should assess and the need to mitigate air quality impacts to achieve ongoing compliance with national air quality standards.	Ref. 34	The policy relates to the methodology for the Air Quality and Odour assessment.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives.	Ref. 35	No new policies for air quality and odour identified at this stage. However, the document will be monitored

Local authority	Relevant local policy	Reference	Relevance to the assessment
			as it progresses through the Local Plan review process.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: - Policy CC8: Pollution and Land Instability lists the air quality guidance that all developers should have regards to. - Policy HQ1: High Quality Development requires adverse impacts on air quality and amenity to be considered in planning applications.	Ref. 36	Policy CC8 – provides guidance on methodology and assessment criteria that align with the NPPF requirements. Policy HQ1 – aligns with NPPF requirements for assessment methodology, receptor selection and mitigation.

Guidance and Standards

- 9.2.6 Relevant guidance and standards which have been used as part of the scoping process are listed below; these will also be taken into account as part of the EIA:
- a. Planning Practice Guidance (PPG) (Ref. 37);
 - b. Institute of Air Quality Management (IAQM) (2017) Guidance on land-use planning and development control: Planning for air quality (Ref. 38);
 - c. IAQM (2024) Guidance on the Assessment of Dust from Demolition and Construction (Ref. 39);
 - d. Department for Environment Food and Rural Affairs (Defra) (2022) LAQM Technical Guidance (TG22) (Ref. 40);
 - e. IAQM (2020) A guide to the assessment of air quality impacts on designated nature conservation sites (Ref. 41); and
 - f. Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001) (2018) (Ref. 42).

9.3 Consultation

- 9.3.1 A summary of key topics raised during non-statutory consultation with regards to air quality and odour is provided below:
- a. Impact on local residents during construction in relation to dust; and
 - b. Concerns relating to choice of construction accesses to/from the Proposed Development, including use of the canal network for transporting construction materials.
- 9.3.2 These topics will be addressed accordingly in the next stage of EIA at PEIR and ES.
- 9.3.3 Furthermore, as part of the EIA process at PEIR and ES stages, consultation will be undertaken with the local planning authorities (as required) to inform the assessment and mitigation for the Proposed Development.

9.4 Study Area

- 9.4.1 This section sets out the study areas adopted for each element of the Proposed Development.
- 9.4.2 The study area includes receptors that would be sensitive to direct and indirect impacts if they were generated by the Proposed Development. Based on the IAQM's Guidance on the Assessment of dust from demolition and construction (Ref. 39), the study area for dust and odour considers sensitive receptors:
- a. within 250 m of the EIA Scoping Boundary;

- b. within 50 m of the routes expected to be affected by the construction phase traffic for a distance of up to 0.5 km from the EIA Scoping Boundary access/egress points; and
 - c. up to 250 m from the EIA Scoping Boundary's access / egress points.
- 9.4.3 For road traffic emission assessments, the study area includes the consideration of sensitive receptors within 200 m of the affected road links expected to be impacted by the construction phase traffic (to be informed by the scope of **Chapter 20: Traffic and Transport**). Affected road links are determined using criteria outlined in the IAQM's guidance on land-use planning and development control: Planning for Air Quality (Ref. 38), defined in Section 9.7.
- 9.4.4 For sensitive ecological receptors, this has been informed by **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial**. As the ecological surveys progress at later stages in the EIA, this will further identify specific sensitive ecological receptors that have the potential to be impacted by emissions generated from the Proposed Development.

Part 1a: Minworth AWTP

- 9.4.5 The EIA Scoping Boundary for the Minworth AWTP (Part 1a of the Proposed Development) is located to the north-east of Birmingham near Royal Town of Sutton Coldfield. Potentially sensitive human health receptors within the study area include residential properties located on Oaklands and Coleshill Road in the village of Curdworth. Potentially sensitive ecological receptors within 250 m of the Part 1a EIA Scoping Boundary include the Birmingham and Black Country Nature Improvement Area.

Part 1b: Minworth to Atherstone Pipeline

- 9.4.6 The Minworth to Atherstone pipeline corridor (Part 1b of the Proposed Development) and surrounding landscape in the area is predominantly agricultural fields. Potentially sensitive human health receptors include residential properties within the defined study area along the pipeline corridor located around Lea Marston, Hurley, Baxterley and Atherstone. Potentially sensitive ecological receptors include the Whitacre Heath Site of Special Scientific Interest (SSSI), Bentley Park Wood SSSI and areas of ancient woodland within the 250 m study area.

Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals

- 9.4.7 The outfall and works to the Coventry, Oxford and Grand Union Canal (Part 2 of the Proposed Development) spans eight local authorities, starting in North Warwickshire and continuing approximately 130 km south, ending in Central Bedfordshire. The majority of the Part 2 EIA Scoping Boundary runs through countryside. For the purposes of the EIA, the air quality and odour study area does not include Part 2 EIA Scoping Boundary (Indicative Non-Working Areas – as presented on **Figure 1-1** in Volume 2 of this EIA Scoping Report) as there are no physical works proposed here and therefore no air quality or odour impacts would arise.

- 9.4.8 Potentially sensitive human receptors include residential properties within 250 m of the Part 2 EIA Scoping Boundary (Indicative Working Areas), schools, hospitals and permanent (leisure, residential and trade) moorings of canal boats.
- 9.4.9 Ecological receptors within the Part 2 EIA Scoping Boundary (Indicative Working Areas) include (but not limited to) Nene Valley Nature Improvement Area (NIA), Newbold Quarry Local Nature Reserve (LNR), Ashlawn Cutting LNR, Linnell Road LNR, Boon's Quarry SSSI and areas of ancient woodland. There are no National Nature Reserves (NNR), National Parks, Ramsar sites, Special Areas of Conservation (SAC), Special Protection Areas (SPA), or Suitable Alternative Natural Green Space (SANG) within the study area.

Part 3: Daventry and Drayton Reservoirs

- 9.4.10 Potentially sensitive human receptors include public rights of way within 250 m of the Part 3 EIA Scoping Boundary
- 9.4.11 Daventry Reservoir is located to the east of Daventry between Daventry and Norton, in Northamptonshire. Daventry Reservoir lies within Daventry Country Park LNR and Nene Valley Nature Improvement Area is within the Part 3 EIA Scoping Boundary.
- 9.4.12 There are no NNRs, National Parks, Ramsar Sites, SSSIs, SACs, SPAs, SANG, or ancient woodland within 250 m of the Part 3 EIA Scoping Boundary.

Part 4a: Abstraction, Storage and Treatment

- 9.4.13 The development includes the abstraction point from GUC near Leighton Buzzard, the water treatment works and treated water pumping station to pipeline. The EIA Scoping Boundary is adjacent to Dunstable AQMA and the development will contribute road traffic movements through the Luton AQMA No.2. Development in the areas includes pipeline and tunnel work.
- 9.4.14 Potential sensitive human receptors include residential properties within 250 m of the Part 4a EIA Scoping Boundary, schools, places of worship and permanent moorings of canal boats.
- 9.4.15 Potential sensitive ecological sites in the area include Dunstable Downs country park and the following SSSIs, Totternhoe Chalk Quarry, Dallow Downs and Windon Hill, Houghton Regis Marl Lakes and Blows Down.

Part 4b: Pipeline to an Underground Reservoir near Luton

- 9.4.16 The development includes the pipeline and the Underground Reservoir near Luton. The development will contribute road traffic movements through the Luton AQMA No.2. on the M1 motorway north of Junction 11.
- 9.4.17 Potentially sensitive human receptors include residential properties within 250 m of the Part 4b EIA Scoping Boundary, schools and places of worship.
- 9.4.18 Potentially sensitive ecological sites in the area include Dunstable Downs country park and the following SSSIs, Totternhoe Chalk Quarry, Dallow Downs and Windon Hill, Houghton Regis Marl Lakes and Blows Down.

Summary

9.4.19 **Table 9-4** provides a summary of the study areas by Proposed Development Part.

Table 9-4: Summary of Study Areas – Air Quality and Odour

Reference point	Study Area
Part 1a: Minworth AWTP	• Within 250 m of the EIA Scoping Boundary; • Within 50 m of the routes expected to be affected by the construction phase traffic, for a distance of up to 0.5 km from the EIA Scoping Boundary access/egress points; and • Up to 250 m from the EIA Scoping Boundary's access/egress points.
Part 1b: Minworth to Atherstone Pipeline	
Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals	
Part 3: Daventry and Drayton Reservoirs	
Part 4a: Abstraction, Storage and Treatment	
Part 4b: Pipeline to Underground Reservoir near Luton	

9.5 Baseline Conditions

Existing Baseline

- 9.5.1 This section provides a summary of the baseline conditions in respect of air quality and odour. The local planning authorities undertake routine ongoing monitoring of ambient air quality as part of their local air quality management duties and the measurements made are located in areas of concern. However, these monitoring locations are too remote from the proposed study areas for the assessment and are not representative of conditions within the EIA Scoping Boundary, and have therefore not been used to describe baseline conditions.
- 9.5.2 Nevertheless, Defra publish projected background concentration maps and these background concentrations have been used to describe baseline conditions across the study areas for NO₂ and particulate matter (PM₁₀ and PM_{2.5} size fractions) (Ref. 43).
- 9.5.3 The odour climate in the combined study area for the Proposed Development includes odour from a mixture of urban and agricultural land uses, including the management of wastewater and solid waste and construction works from HS2 Phase 2. As the Proposed Development does not introduce any new sources of odour or significantly different odours, it is not proposed to undertake baseline odour surveys as the Proposed Development does not have the potential to change the baseline odour climate.

Part 1a: Minworth AWTP

- 9.5.4 Part 1a of the Proposed Development is located within Birmingham City Council's administrative area, which has a city-wide AQMA declared (Ref. 14). The background air quality concentrations at the Minworth AWTP EIA

Scoping Boundary are 50% or less than the air quality objective values for NO₂ and particulate matter in 2024 and projected to decrease further up to 2030. The air quality standards are not at risk of exceedance within or adjacent to the study area.

- 9.5.5 Baseline odour sources include odours from inputs to Minworth WwRC, but not from the facilities outputs that would feed into the Proposed Development. There have been occasional complaints of odour from specific chemicals used to stabilise material extracted from HS2 tunnelling operations. There are no baseline odours of direct relevance to this assessment.

Part 1b: Minworth to Atherstone Pipeline

- 9.5.6 Part 1b of the Proposed Development is located within North Warwickshire Borough Council's administrative area. The background air quality concentrations within the study area are 50% or less than the objective values for NO₂ and particulate matter in 2024 and projected to decrease further up to 2030.
- 9.5.7 There are no AQMAs declared within North Warwickshire Borough Council's administrative area, and air quality standards are not at risk of exceedance within or adjacent to the study area. There are no baseline odour sources of relevance to this assessment.

Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals

- 9.5.8 Part 2 of the Proposed Development is located within a number of local authority administrative areas.
- 9.5.9 North Warwickshire Borough Council, West Northamptonshire, Milton Keynes City Council, Buckinghamshire Council and Central Bedfordshire have no AQMAs declared adjacent to or within the EIA Scoping Boundary. The background air quality concentrations around the study area are 50% or less than the objective values for NO₂ and particulate matter in 2024 and projected to decrease further up to 2030.
- 9.5.10 The Midland Road/Corporation Street AQMA within Nuneaton and Bedworth Borough Council is adjacent to the Part 2 EIA Scoping Boundary. The background air quality concentrations around the study area are 75% or less than the air quality objective values for NO₂ and particulate matter in 2024.
- 9.5.11 Coventry City Council and Rugby Borough Council have declared administrative area-wide AQMAs respectively. The background concentrations are 50% or less than the relevant objective values for NO₂ and particulate matter within and adjacent to the study area in 2024 and the air quality standards are not at risk of exceedance.
- 9.5.12 The baseline odour climate includes infrequent and short term emissions of odorous substances emitted during the removal and transport of sediments from the canal as part of routine canal maintenance operations. These odours would impact upon users of the canal, public rights of way crossing the canal and canal side properties.

Part 3: Daventry and Drayton Reservoirs

- 9.5.13 Part 3 is located in West Northamptonshire Council's administrative area. The background air quality concentrations at the Part 3 EIA Scoping Boundary are 50% or less than the relevant air quality objective values for NO₂ and particulate matter in 2024 and the air quality standards are not at risk of exceedance.
- 9.5.14 West Northamptonshire Council's administrative area has no AQMAs declared adjacent to or within the Part 3 EIA Scoping Boundary.

Part 4a: Abstraction, Storage and Treatment

- 9.5.15 Part 4a of the Proposed Development is located within Central Bedfordshire Council's administrative area. The background air quality concentrations around the study area locations are 50% or less than the relevant air quality objective values for NO₂ and particulate matter in 2024 and the air quality standards are not at risk of exceedance.
- 9.5.16 Central Bedfordshire Council's administrative area has no AQMAs declared adjacent to or within the EIA Scoping Boundary.
- 9.5.17 The baseline odour climate includes infrequent and short term emissions of odorous substances emitted during the removal and transport of sediments from the canal as part of routine canal maintenance operations. These odours would impact upon users of the canal, public rights of way crossing the canal and canal side properties.

Part 4b: Pipeline to an Underground Reservoir near Luton

- 9.5.18 Part 4b of the Proposed Development is located within Central Bedfordshire and Buckinghamshire Council areas and adjacent to Luton Borough Council administrative area.
- 9.5.19 Dunstable AQMA within Central Bedfordshire's administrative area is within the Part 4b EIA Scoping Boundary. The background air quality concentrations around the study area are 50% or less than the relevant AQAL for NO₂, PM₁₀ and PM_{2.5} in 2024. The highest non-automatic monitoring within the Dunstable AQMA (diffusion tube SB37 Kerbside) was 31.1 µg/m³ (micrograms per cubic metre) in 2022 which is just over 75% of the standard. It is unclear at this stage if Central Bedfordshire Council is considering revoking the Dunstable AQMA Order. Further consultation with Central Bedfordshire Council will be undertaken to confirm this to inform the PEIR and ES.
- 9.5.20 Luton AQMA No.2 is not adjacent to the Part 4b EIA Scoping Boundary but the Proposed Development can reasonably be expected to generate additional road vehicle movements through the AQMA which is formed of properties facing onto the M1 to the north of Junction 11. Outside of the AQMA the background air quality concentrations at the Part 4b EIA Scoping Boundary and within the study area are 50% or less of the air quality objective values for NO₂ or particulate matter in 2024 and the air quality standards are not at risk of exceedance.
- 9.5.21 There are no AQMAs declared within the Buckinghamshire Council administrative area.

- 9.5.22 There are no sources of odour within the study area that are of relevance to this assessment.

Future Baseline

- 9.5.23 The future air quality within the study area is likely to improve slightly as the gradual reduction in older vehicles within the national fleet continues, with or without the widespread uptake of electric vehicles.
- 9.5.24 The odour climate in the study area is likely to remain similar to the current baseline conditions, which include odour from a mixture of urban and agricultural land uses.

9.6 Potential Effects

Construction Phase

- 9.6.1 The scoping of potential effects from the Proposed Development during the construction phase is presented within **Table 9-5** below.

Table 9-5: Potential effects during the construction phase – Air Quality and Odour

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Construction dust impacts, including the use of NRMM	Out	1a and 4a	The potential impacts from dust emissions arising from activities during the construction phase have been considered using an approach based on the IAQM Guidance (2024) (Ref. 39). Construction activities for Parts 1a and 4a of the Proposed Development are anticipated to include earthworks, concrete batching plant and the erection and fitting out of a steel frame building with low to moderate dust generating potential. Construction dust emissions will be controlled using good practice techniques and mitigation measures will be identified and secured through a Dust Management Plan as part of the Code of Construction Practice (CoCP). Therefore, no significant air quality or amenity impacts from dust generation are likely if a management plan is adopted.
	In	1b, 2, 3 and 4b	The potential impacts from dust emissions arising from activities during the construction phase has been considered using an approach based on the IAQM Guidance (2024) (Ref. 39). Construction activities for Parts 2 and 3 are anticipated to include pipeline cut and fill and small-scale drilling, construction of pumping stations, bypass weirs, bank raising, and other works to the canal network. Given the sensitivity of the canal network and users, this has been scoped in on a precautionary basis. Construction of the Minworth to Atherstone pipeline (Part 1b) and pipeline to an underground reservoir near Luton (Part 4b) would be undertaken in a phased manner for each Part with work activity progressing sequentially from one location to the next. The duration of works at any one location would be considered short-term. Construction activities for Parts 1b and 4b are anticipated to include pipeline cut and fill and small-scale boring

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			delivered using small crews that move from work site to work site along the pipeline corridor. The works are considered to have low dust generating potential. Construction dust emissions will be controlled using good practice techniques and mitigation measures will be identified and secured through a Dust Management Plan as part of the CoCP. However, due to the location of sensitive ecological receptors immediately adjacent to Part 1b EIA Scoping Boundary (e.g. Dunton Coppice Ancient Woodland, Holly Thicks Ancient Woodland and Gallops Hill Wood Ancient Woodland) a construction dust risk assessment has been scoped into the EIA.
Construction odour impacts, including the use of NRMM	Out	All	No significant odour impacts are expected to arise as part of the construction phase works, with any potential odours arising only during operation. However, any potential odour impacts would be managed through an Odour Management Plan (if required) as part of the CoCP.
Construction traffic emissions (outside an AQMA)	Out	Part 1b, 2 (partially), and 3	The majority of the Proposed Development will take place in areas outside AQMAs. However, Parts 1a, 4a and 4b are located within an AQMA(s) and are therefore not included in this particular assessment. The potential impacts from vehicle traffic emissions arising from activities during the construction phase for Parts 1b, 2 [partially] and 3 (i.e. those outside AQMAs) have been considered using an approach based on the IAQM Guidance (2017) (Ref. 38). The IAQM Guidance sets out the criteria to establish the need for an air quality assessment based on a 2-way (Annual Average Daily Traffic [AADT] flows that exceed 500 Light Duty Vehicles [LDV], or exceed 100 Heavy Duty Vehicles [HDV]). On the basis of professional judgement, it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria. Therefore, this has been proposed to be scoped out.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Construction traffic emissions (within or adjacent to an AQMA)	Out	Parts 1a, 2 (partially) 4a and 4b	Construction works within or adjacent to AQMAs declared by the Birmingham City Council, Rugby Borough Council, Coventry City Council and Central Bedfordshire occur as part of Part 1a and 2 [partially] of the Proposed Development. Construction works within or adjacent to AQMAs declared by Central Bedfordshire and Luton Borough Council occur as part of Parts 4a and 4b of the Proposed Development, The potential impacts from traffic emissions arising from activities during the construction phase have been considered using an approach based on the IAQM Guidance (2017) for areas within or adjacent to an AQMA (Ref. 38). The IAQM Guidance sets out the criteria (AADT more than 100 LDVs or more than 25 HDVs) to establish the need for an air quality assessment for the construction phase of a development. On the basis of professional judgement, it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria. Therefore, this has been proposed to be scoped out.

Operational Phase

- 9.6.2 The scoping of potential effects from the Proposed Development during the operational phase is presented within **Table 9-6** below.

Table 9-6: Potential effects during the operational phase – Air Quality and Odour

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Operational emissions, including use of NRMM	Out	All	The operation of the Proposed Development would generate emissions to air at comparable rates to the current baseline scenario. There would be no direct emissions from the operation of the Minworth AWTP (Part 1a) or the pumping stations along the canal network (Part 2, 3 and 4a) and the final transfer of water in Part 4b. No odour issues associated with the operation of the AWTP are anticipated. The Flocculation and Sedimentation (flocculation and sedimentation) process, which will be constructed adjacent to existing processes at Minworth WwRC, is an additional settlement process to those that exist already, and there are no gases emitted as part of the settlement process. The remaining AWTP processes are within a building and any odour would be contained within the building. If any odour is emitted from the Minworth AWTP or the pipeline and associated pumping stations it can be reasonably assumed to be at below local baseline levels and would not be perceptible to receptors in the area. Therefore, assessment of operational emissions and odour impacts during the operational phase can be scoped out.
Operational odour	Out	All	The Proposed Development does not have the potential to change the baseline odour climate at any relevant receptor location (in Part 1a, 1b, 2, 3, 4a, or 4b) as it cannot give rise to a new odorous emission that

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			are not already present in the baseline and the magnitude and frequency of emissions from canal maintenance activity would be unchanged from the baseline conditions.
Operational road traffic emissions	Out	All	Operation of the Proposed Development would generate very limited numbers of operational vehicles. Operational traffic will primarily comprise operators of the Minworth AWTP (Part 1a) and abstraction, storage and treatment site in Part 4a, and maintenance visits, as required, to the two pipelines (Part 1b and 4b) and canal network (Parts 2 and 3). On the basis of professional judgement, it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria. Therefore, this has been proposed to be scoped out.

9.7 Approach to Assessment

Establishing Baseline Conditions

9.7.1 Baseline air quality will be established on the basis of a desk-based study. Sources of baseline information for the desk-based study will include the following:

- a. Defra Background Maps (Ref. 43);
- b. Air Pollution Information Systems (APIS) (Ref. 44); and
- c. Odour complaint histories from local authority pollution control departments.

9.7.2 Potential sensitive receptors will be identified based on a review of aerial photography, Defra's Magic Map Application, the APIS database (Ref. 45), Proposed Development's plans and OS mapping, and with consideration to current guidance, including:

- a. IAQM (2024) Guidance on the Assessment of Dust from Demolition and Construction (Ref. 39);
- b. Defra (2022) LAQM Technical Guidance (TG22) (Ref. 43); and
- c. IAQM (2020) A guide to the assessment of air quality impacts on designated nature conservation sites (Ref. 41).

- 9.7.3 At this time no need has been identified to undertake project specific baseline odour surveys or baseline surveys for NO₂ or other pollutants. Where there is a known air quality constraint, such as at AQMAs local authority measurement data is already available.

Assessment Methodology

Quantitative construction works air quality assessment

- 9.7.4 A qualitative construction phase impact assessment will use the approach and criteria proposed by the IAQM Guidance (Ref. 39 and Ref. 41). The approach considers the potential magnitude of 'possible' emissions for works based on the scale, duration and nature of the required activities and the properties of the materials involved. The distance between the location of works, represented by the EIA Scoping Boundary, and potentially sensitive receptors is established for human health, public amenity and designated ecological site type receptors. This information is combined to estimate the risk of adverse impacts and the good practice control measures that should be adopted as embedded measure, prior to considering the likely effects and the need for site-specific mitigation measures.
- 9.7.5 Where scoped into the assessment, the dust risk assessment considers the potential impact on human health and public amenity within 250 m of the EIA Scoping Boundary and ecological sites with sensitive features located within 50 m of the EIA Scoping Boundary. Potential impacts of dusty material tracked out onto the public highway will be considered for all receptor types within 50 m of the roadside, for a distance of up to 0.5 km from the EIA Scoping Boundary access / egress points.

Quantitative construction road traffic local air quality assessment

- 9.7.6 The anticipated number of vehicles that will be in operation during construction and operation have been considered in the context of the guidance published by IAQM (2017) (Ref. 38) and IAQM (2024) (Ref. 39). The guidance sets out the criteria to establish the need for an air quality assessment for the construction phase of a development as causing a significant change in LDV or HDV traffic flows on local roads with relevant receptors. Indicative criteria includes:
- a. A change of LDV flows of:
 - i. More than 100 AADT within or adjacent to an AQMA; or
 - ii. More than 500 AADT elsewhere;
 - b. A change of HDV flows of:
 - i. More than 25 AADT within or adjacent to an AQMA; or
 - ii. More than 100 AADT elsewhere.
- 9.7.7 Where the predicted road traffic flows are below the criteria, they would not be expected to adversely affect air quality and therefore would be scoped out of the assessment. A review of the affected road links and traffic flow estimates will be undertaken at PEIR and ES to confirm the scoping out of the assessment for each Part of the Proposed Development.

- 9.7.8 If there are any road links where the traffic criteria are exceeded, these would be scoped into the assessment and modelled using the dispersion model software 'ADMS-Roads'.

Assessment Criteria

Sensitivity of Receptors

- 9.7.9 Sensitive receptors for air quality are generally public exposure receptors (sensitive locations where relevant exposure for the air quality criteria being assessed could occur, e.g. residential properties or schools) and ecological sites sensitive to dust deposition and nitrogen deposition.
- 9.7.10 The AQS objectives (as set out in the Air Quality Standards Regulations 2010 (Ref. 46) have been set at concentrations that provide protection to all members of society, including more vulnerable groups such as the very young, elderly or unwell. As such the sensitivity of receptors was considered when setting the objectives and therefore no additional subdivision of human health receptors on the basis of building or location type is necessary for long-term air pollutant concentration-based impacts.

Road traffic air quality effect descriptors

- 9.7.11 If any road traffic links are scoped into the assessment, the below assessment criteria would be used to determine the magnitude of effects and their significance.
- 9.7.12 A comparison of the modelled concentration at each receptor between the with and without the Proposed Development would be undertaken. This magnitude of change at each receptor would be classified as:
- Imperceptible – where the change in concentration is less than 0.4 $\mu\text{g}/\text{m}^3$ for NO_2 and PM_{10} and less than 0.2 $\mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$;
 - Very Small – where the change in concentration is more than 0.4 $\mu\text{g}/\text{m}^3$ for NO_2 and PM_{10} and more than 0.2 $\mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$;
 - Small – where the change in concentration is more than 0.6 $\mu\text{g}/\text{m}^3$ for NO_2 and PM_{10} and more than 0.3 $\mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$;
 - Medium – where the change in concentration is more than 2.2 $\mu\text{g}/\text{m}^3$ for NO_2 and PM_{10} and more than 1.1 $\mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$; and
 - Large – where the change in concentration is more than 4 $\mu\text{g}/\text{m}^3$ for NO_2 and PM_{10} and more than 2 $\mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$.
- 9.7.13 For consideration of a change in annual mean concentrations of a given magnitude, the IAQM (Ref. 38) have published recommendations for describing the effects of such impacts at individual receptors, for long-term average concentrations of all modelled pollutants.
- 9.7.14 The IAQM Guidance (Ref. 38) includes seven explanatory notes to accompany the terminology for the effect descriptors. In particular, it is noted that the descriptors are for individual receptors only and that overall significance is determined using professional judgement. The importance of recognising the appropriate level of accuracy for incremental changes or background concentrations is noted, and this is especially important when total concentrations are close to the objective value. For a given year in the future, it is impossible to define the new total concentration without

recognising the inherent uncertainty caused by year to year variations in meteorological conditions. This uncertainty is addressed by using a category that has a range around the objective value, rather than a single threshold value that is exactly equal to the objective value.

Table 9-7: Air Quality Effect Descriptors for Long-Term Changes in Ambient Pollutant Concentrations at Individual Receptors

Long-Term Average Concentration at Receptor in Assessment Year (% of AQAL)	Change in Concentration Relative to Air Quality Assessment Level (AQAL) (%)				
	Less than 1% Imperceptible	1% Very Small	2 – 5% Small	6 – 10% Medium	>10% Large
≤ 75%	Negligible	Negligible	Negligible	Minor	Moderate
76 – 94%	Negligible	Negligible	Minor	Moderate	Moderate
95 – 102%	Negligible	Minor	Moderate	Moderate	Major
102 – 109%	Negligible	Moderate	Moderate	Major	Major
≥ 110%	Negligible	Moderate	Major	Major	Major

- 9.7.15 A change in predicted annual mean concentrations of pollutants of less than 1% is considered to be an imperceptible impact magnitude. A change (impact) that is imperceptible, given normal bounds of variation, would not be capable of having a direct effect on local air quality and would always represent a negligible effect at any individual receptor. Effect descriptors for larger impact magnitudes reflect the risk of the predicted change resulting in concentrations increasing above air quality assessment levels, or if already above those levels, of interfering with action plan measures intended to reduce air pollutant concentrations.

Effect Significance

- 9.7.16 The significance of the reported likely effects is then considered for the Proposed Development in overall terms. The potential for the Proposed Development to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality are considered if relevant, but the principal focus is in determining the significance of any change to the likelihood of future achievement of the air quality objective values for NO₂, PM₁₀ and PM_{2.5}.
- 9.7.17 The achievement of local planning authority goals for local air quality management are directly linked to the achievement of the air quality objective values and as such, the assessment will focus on the likelihood of future achievement of the air quality objective values as a result of the Proposed Development.

9.8 Assumptions, Limitations, and Uncertainties

- 9.8.1 There are no limitations or assumptions that affect the consideration of air quality or odour impacts.

9.9 Approach to Mitigation

- 9.9.1 Construction related plant emissions are anticipated to represent a small source of emissions relative to ambient local conditions in the vicinity of the EIA Scoping Boundary based on the scale of work that would occur and the number of plant vehicles that would be required. However, suitable control measures for plant and motorised equipment will be recommended based on advice prescribed in IAQM Guidance (2024) (Ref. 39) and incorporated into the CoCP. This will include the requirement for contractors to prepare a Dust Management Plan and an Odour Management Plan as embedded good/standard practice measures.

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Chapter 10: Climate

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10. Climate

10.1 Introduction

- 10.1.1 This chapter presents the scope and methodology for the assessment of potential significant effects of the Proposed Development on the climate and the impact of climate change on the Proposed Development.
- 10.1.2 The chapter includes a summary of the baseline conditions, policy context and the approach to the assessment of possible construction and operational effects. Matters that are proposed to be scoped in and out of the Environmental Impact Assessment (EIA) are identified.
- 10.1.3 In line with Institute of Environmental Management and Assessment (IEMA) guidance (Ref. 1 and Ref. 2) and the requirements of The Infrastructure Planning (Environmental Impact Assessment) 2017 (as amended) (Ref. 3), the climate change aspects considered within this chapter comprise three assessments which are described in **Table 10-1**.

Table 10-1: Definition of climate assessment elements

Assessment Type	Definition
Greenhouse gas (GHG) Impact assessment	The impact of GHG emissions arising from the Proposed Development on the climate over its lifetime.
Climate Change Resilience Assessment (CCRA)	The resilience of the Proposed Development to climate change impacts, including how the design will mitigate potential climate change impacts.
In-combination climate change Impact (ICCI) assessment	The combined impact of the Proposed Development and future climate change on the surrounding environment.

- 10.1.4 While the climate assessment elements outlined within **Table 10-1** are considered within this single EIA Scoping Report chapter, it is proposed that the GHG Impact Assessment and the CCRA and ICCI assessments are reported in two separate Environmental Statement (ES) chapters, these being 'Carbon' and 'Climate' respectively.
- 10.1.5 The chapter should be read in conjunction with the below relevant topic chapters of this EIA Scoping Report:
- Chapter 17: Major Accidents and Disasters;**
 - Chapter 21: Waste and Materials;** and
 - Chapter 22: Water Environment and Flood Risk.**

10.2 Legislation, Planning Policy Context, and Guidance

- 10.2.1 Legislation, planning policy and guidance relevant to the scope and method of climate assessment are outlined below.

Legislation

Climate Change Act 2008 & Climate Change Act (2050 Target Amendment) Order 2019

- 10.2.2 The Climate Change Act 2008 (Ref. 4) set a legally binding target for the UK to reduce its GHG emissions from 1990 levels by at least 80% by 2050. This target is supported by legally binding five-year 'carbon budgets' and an independent body to monitor progress, the Climate Change Committee (CCC). The UK carbon budgets restrict the amount of GHG emissions the UK can legally emit in a defined five-year period.
- 10.2.3 The Climate Change Act 2008 was amended in 2019 (Ref. 5) to revise the previous 80% reduction target and legislate for net zero emissions by 2050. In 2020, the 6th Carbon Budget (Ref. 10) was published by the CCC for consideration by the UK Government and is the first budget to reflect the amended trajectory to net zero by 2050.
- 10.2.4 The UK carbon budgets will be used to determine significance of GHG emissions from the Proposed Development, as described in Section 10.7.

United Nations Framework on Climate Change Paris Agreement

- 10.2.5 The Paris Agreement (Ref. 6) is an agreement under the United Nations Framework Convention on Climate Change (UNFCCC) dealing with GHG emissions mitigation, adaptation and finance starting in the year 2020. It requires all signatories (including the UK) to strengthen their climate change mitigation efforts to keep the increase in global average temperatures to well below 2°C this century above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C (Ref. 6).

Carbon Budget Order 2021

- 10.2.6 Under the Carbon Budgets system, every tonne of greenhouse gases emitted up to 2050 will count. Where emissions rise in one sector, the UK will have to achieve corresponding falls in another. The following Carbon Budgets have been published to date:
- The Carbon Budgets Order 2009 (Ref. 7) sets the carbon budget totals for the 1st (2008-2012), 2nd (2013-2017) and 3rd (2018-2022) Carbon Budget periods;
 - The Carbon Budget Order 2011 (Ref. 8) sets the carbon budget total for the 4th (2023-2027) Carbon Budget period;
 - The Carbon Budget Order 2016 (Ref. 9) sets the carbon budget total for the 5th (2028-2032) Carbon Budget period; and
 - The Carbon Budget Order 2021 (Ref. 10) sets the carbon budget total for the 6th 3+6+++ (2033-2037) Carbon Budget period.

National Policies, Plans and Strategies

- 10.2.7 The relevant national policies, plans and strategies for climate change are summarised within **Table 10-2**.

Table 10-2: National policies, plans and strategies – Climate Change

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
Carbon Budget Delivery Plan (CBDP) (Ref. 11)	The CBDP¹ was issued by the UK Government and sets out the Government's detailed proposals and policies to enable the delivery of the 4th, 5th and 6th Carbon Budgets in accordance with the Climate Change Act (Ref. 4). The CBDP outlines several key strategies to meet these carbon reduction targets: • <i>Decarbonising Power Generation</i>: Transitioning to renewable energy sources like wind, solar, and nuclear to reduce emissions from the power sector. • <i>Energy Efficiency</i>: Implementing measures to improve energy efficiency in buildings, transportation, and industry to lower overall energy consumption. • <i>Carbon Capture and Storage</i>: Developing and deploying technologies to capture and store carbon dioxide emissions from industrial processes and power generation. • <i>Electrification of Transport</i>: Promoting the use of electric vehicles and developing the necessary infrastructure to support widespread adoption.	The CBDP outlines the strategies and measures necessary to meet carbon reduction targets. Regarding the development of a Climate assessment, the CBDP offers key guidance across: • <i>Baseline Setting</i>: The plan guides baseline development for current GHG emissions (i.e., current baseline), which is essential for assessing the impact of a proposed development. • <i>Mitigation Measures</i>: The plan offers guidelines on implementing mitigation measures for the reduction of GHG emissions across a project's lifetime; this ensures developments align with national and international carbon reduction goals. • <i>Significance of Evaluation</i>: The plan aids the evaluation of the significance of GHG emissions from a development. • <i>Reporting and Monitoring</i>: The plan outlines the requirements for reporting and monitoring GHG emissions, ensuring transparency and accountability throughout a project life cycle.

¹ In May 2024, the High Court ruled that the CBDP was unlawful, due to the policies and proposals it contains being found inadequate to meet the UK's carbon budgets (see Ref. 13). The Government was ordered to draw up a revised plan within 12 months.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	• <i>Sustainable Agriculture and Land Use</i>: Encouraging practices that reduce emissions from agriculture and enhance carbon sequestration in forests and soils. • <i>Innovation and Technology</i>: Investing in research and development of new technologies that can help reduce emissions and improve sustainability.	
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 13)	The NPSWRI outlines the UK Government's approach to ensuring a sustainable and resilient water supply system amidst changing environmental conditions: • <i>Climate Change and Water Resources</i> – the document highlights the effect of climate change on water availability by changing rainfall patterns, increasing the likelihood of droughts, and altering seasonal water flows. In particular, the water industry must adapt to these changes by developing infrastructure and management strategies that are resilient to a wider range of climate scenarios. • <i>Policy and Planning</i> – the document notes that policies, programs, and investment decisions must consider the extent of climate change and its impacts on water resources. It mandates the integration of adaptation measures into the design and operation of water infrastructure and emphasises detailed consideration of climate change effects.	The NPSWRI includes numerous requirements relevant to climate change adaptation and mitigation and greenhouse gas assessments: • <i>Section 3.7</i>: Requires an Applicant to consider the potential impacts of climate change on new water infrastructure projects across design, construction, and operational stages. The NPSWRI notes that the consideration of impacts must follow the latest UK planning practice guidance on climate change allowances and identify appropriate mitigation/adaptation measures. In addition, adaptation measures should be based on UK Climate Projections, the most recent UK Climate Change Risk Assessment, and statutory consultation responses. • <i>Section 4.4</i>: Requires an Applicant to assess the climate impact of the project (including embodied carbon), both from construction and operation, such that it can be assessed against the Government's climate obligations. In addition, evidence of appropriate mitigation measures in design, construction and operation should be presented by the

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	• <i>Mitigation and Offsetting</i> – the document discusses the need for water resources projects to mitigate their environmental impact, including greenhouse gas emissions. It suggests measures such as using energy-efficient technologies, energy recovery processes, renewable energy sources, and offsetting emissions through environmental improvements. • <i>Biodiversity and Environmental Considerations</i> – the document underlines the importance of enhancing biodiversity and the natural environment as part of water resources development, including the requirement for Biodiversity Net Gain and consideration of wider strategic environmental outcomes.	Applicant. The Applicant should demonstrate that it has investigated feasible options in terms of using: energy efficient technology or processes, energy recovery technologies or processes, renewable energy sources, renewable energy initiatives, and greenhouse gas offsetting measures.
National Planning Policy Framework (NPPF) (Ref. 14)	The NPPF, revised in December 2024, sets out the Government's planning policies for England and how these are expected to be applied. The NPPF states that planning systems should support the transition to a low carbon future, including: • Contributing to the reduction in GHG emissions; • Minimising vulnerability and improving resilience; • Encouraging the reuse of existing resources; and • Supporting renewable and low-carbon energy and Infrastructure.	The NPPF is relevant to climate assessments for multiple reasons: • <i>Policy guidance</i> – the NPPF provides clear policy guidance on how planning should address climate change. It emphasises the need for developments to contribute to the reduction/mitigation of GHG emissions. • <i>Assessment requirements</i> – the NPPF outlines the necessity for planning applications to be accompanied by assessments that consider the environmental impacts, including lifetime GHG emissions. • <i>Climate Change Mitigation and Adaptation</i> – the NPPF encourages the incorporation of measures to mitigate and adapt to climate change within assessments. This

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
		includes promoting energy efficiency, renewable energy sources, and sustainable transport options, to name a few. • <i>Risk Management</i> – the NPPF requires that assessments consider the full range of potential climate change impacts, including flood risk, and water scarcity.

Local Policy

- 10.2.8 The local policies listed in **Table 10-3** are considered relevant to the scope and method of assessment of potential climate change impacts presented in this chapter.

Table 10-3: List of relevant local policy – Climate Change

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan (BDP) 2011-2031: • Policy TP2 - Adapting to climate change; • Policy TP3 - Sustainable construction; • Policy TP4 - Low and zero carbon energy generation; and • Policy TP6 - Management of flood risk and water resources.	Ref. 15	The BDP 2011-2031 is relevant to a climate assessment as it provides a comprehensive framework for addressing climate change through its various policies. For example, the BDP mandates the integration of climate resilience measures in new developments (Policy TP2) such as the Proposed Development, the adoption of sustainable construction practices (Policy TP3), the promotion of low and zero-carbon energy generation (Policy TP4), and effective flood risk management (Policy TP6). The noted policies collectively ensure that new developments should mitigate their impact on the global climate and contribute to Birmingham's broader climate change objectives.
	New Local Plan for Birmingham 2042.	Ref. 16	The New Local Plan for Birmingham 2042 includes numerous policies related to a climate assessment. Key measures related to the Proposed Development include key design requirements for development projects, such as the integration of renewable energy, green infrastructure, and strict energy efficiency standards for new buildings. This aspires to ensure Birmingham's growth meets climate change targets and supports a sustainable future.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • Policy LP10 – Natural Environment and Carbon Sequestration • Policy LP14 – Landscape;	Ref. 17	These policies collectively encourage the development and use of renewable energy sources, promote sustainable design and construction practices, focus on managing flood risk, promote green infrastructure, encourage sustainable transport modes, and require new

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy LP33 – Water and Flood Risk Management; and - Policy LP35 – Renewable Energy and Energy Efficiency.		developments to incorporate climate change resilience measures.
Warwickshire County Council	Warwickshire County Council (WCC) Plan 2022-2027.	Ref. 18	The Council Plan supports WCC's climate emergency declaration (Ref. 19) and integrates climate change mitigation and adaptation into its broader vision for Warwickshire's future. The Council Plan includes several initiatives and commitments linked to climate change; this includes building upon the WCC Climate Change Action Plan.
	Climate Change Action Plan 2021.	Ref. 20	This Action Plan outlines policies aimed at reducing carbon emissions, enhancing climate resilience, and fostering sustainable development across Warwickshire. It establishes a county-wide target to achieve net-zero emissions by 2050 while also incorporating adaptation measures to address climate change impacts, including flooding and extreme heat.
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: - Policy NE1 - Green Infrastructure; - Policy NE2 - Open Space; - Policy NE3 - Biodiversity and Geodiversity; - Policy NE4 – Managing flood risk and water quality;	Ref. 21	These policies focus on reducing carbon emissions and enhancing climate resilience. They also strengthen green infrastructure and preserve open spaces. The plan aims to protect biodiversity and geodiversity while promoting sustainable design and construction. Additionally, it encourages the use of renewable and low-carbon energy, improves environmental quality for better health, and effectively manages flood risks.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy BE2 - Renewable and Low Carbon Energy; • Policy BE3 - Sustainable Design and Construction; and • Policy HS5 – Health.		
	Borough Plan Review 2021-2039.	Ref. 22	The Borough Plan Review 2021-2039 is relevant to the climate assessment as it updates policies to address climate challenges by encouraging greater use of renewable energy and enhanced energy efficiency, promoting sustainable design and construction practices to reduce carbon emissions, incorporating advanced flood risk management measures like Sustainable Drainage Systems (SuDS), expanding green spaces to support biodiversity and resilience, promoting sustainable transport options such as public transport, cycling, and walking, and requiring new developments to integrate climate resilience features.
Coventry City Council	Coventry Local Plan (2011-2031): • Policy EM1 - Planning for Climate Change Adaptation; • Policy EM2 - Building Standards; • Policy EM3 - Renewable Energy Generation; • Policy EM4 - Flood Risk Management; • Policy EM5 - Sustainable Drainage Systems (SuDS);	Ref. 23	These policies are relevant to the climate assessment as they require new developments to incorporate climate resilience measures, promote sustainable construction and energy-efficient standards, support renewable energy projects, focus on flood risk management through SuDS, aim to improve air quality, encourage green infrastructure, and develop a sustainable transport network to reduce GHG emissions.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy GE1 - Green Infrastructure; and - Policy AC1 - Accessible Transport Network.		
	Local Plan Review: Issues and Options Consultation (2023).	Ref. 24	This plan is relevant to climate change as it addresses key strategies for reducing carbon emissions, enhancing climate resilience, and promoting sustainable development. The review considers the integration of renewable energy sources, implementation of sustainable construction practices, effective flood risk management through SuDS, expansion of green infrastructure, and the promotion of sustainable transport options such as public transport, cycling, and walking. These measures ensure that future developments align with climate change mitigation and adaptation goals, supporting a sustainable and resilient future for the community.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: - Policy SDC1 - Sustainable Design; - Policy SDC4 - Sustainable Buildings; - Policy SDC5 - Flood Risk Management; - Policy SDC6 - Sustainable Drainage Systems (SuDS); - Policy SDC7 - Protection of the Water Environment and Water Supply;	Ref. 25	These policies collectively address climate change by promoting sustainable design and construction, supporting renewable energy projects, and implementing effective flood risk management through SuDS. They aim to protect water resources, enhance biodiversity, and develop green infrastructure. Additionally, they focus on creating healthy, safe, and inclusive communities which seeks to promote access to Public Rights of Way. This comprehensive approach ensures that new developments contribute to climate change mitigation and adaptation, aligning with sustainability goals for Rugby Borough.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy SDC8 - Supporting the Provision of Renewable Energy and Low Carbon Technology; • Policy HS1 - Healthy, Safe and Inclusive Communities; • Policy NE1 - Protecting Designated Biodiversity and Geodiversity Assets; and • Policy NE2 – Strategic Green and Blue Infrastructure.		
	Rugby Borough Local Plan review – issues and options consultation (2023).	Ref. 26	The review addresses the climate change impacts of new developments by promoting renewable energy integration, enhancing energy efficiency standards, implementing rigorous flood risk management and SuDS, expanding green infrastructure for biodiversity and urban resilience, encouraging sustainable transport options, and incorporating climate resilience measures in planning and design. These updates ensure new developments contribute to climate change mitigation and adaptation, aligning with local and national sustainability goals.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: • Policy S10 - Sustainable Development Principles; • Policy S11 - Low Carbon and Renewable Energy; • Policy BN7 - Flood Risk;	Ref. 27	These policies collectively ensure that new developments contribute to climate change mitigation and adaptation through sustainable development practices, renewable energy use, effective flood risk management, pollution control, and promoting sustainable transport initiatives. This comprehensive approach aligns with broader climate change objectives, fostering a sustainable and resilient future for the region.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy BN9 - Planning for Pollution Control; and • Policy C1 - Changing Behaviour and Achieving Modal Shift.		
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: • Policy ENV4 - Green Infrastructure; • Policy ENV5 - Biodiversity; • Policy ENV8 - Renewable Energy; • Policy ENV9 – Renewable Energy and Low Carbon Development; • Policy ENV10 - Design; and • Policy ENV11 – Local Flood Risk Management.	Ref. 28	These policies address climate change by promoting green infrastructure, enhancing biodiversity, supporting renewable and low carbon energy projects, managing flood risks and water resources, and controlling pollution.
	New Local Plan for West Northamptonshire 2041.	Ref. 29	The updated plan is relevant to addressing climate change as it promotes renewable energy integration, enhances energy efficiency standards, and advocates for sustainable design and construction practices. It includes robust flood risk management through SuDS and expands green infrastructure to support biodiversity and improve air quality. The plan encourages sustainable transport options such as public transport, cycling, and walking to reduce emissions, and requires new developments to incorporate climate resilience measures, including heat-resistant materials and water conservation technologies. By

Local authority	Relevant local policy	Reference	Relevance to the assessment
			protecting and enhancing natural habitats, the plan ensures that future developments contribute to climate change mitigation and adaptation, fostering a sustainable, low-carbon, and resilient community.
Milton Keynes City Council	Plan: MK 2016 – 2031: • Policy CT1 – Sustainable Transport Network; • Policy FR1 - Managing Flood Risk; • Policy FR2 - Sustainable Drainage Systems (SuDS) and Integrated Flood Risk Management; • Policy NE3 – Biodiversity and Geological Enhancement; • Policy NE4 – Green Infrastructure; • Policy NE6 – Environmental Pollution; and • Policy SC1 – Sustainable Construction.	Ref. 30	In summary the plan ensures that new developments address climate change by incorporating sustainable transport, flood resilience, and energy-efficient design. It promotes green infrastructure, biodiversity protection, and pollution control to enhance environmental quality and carbon sequestration. The plan also supports the use of renewable energy and sustainable drainage solutions, ensuring developments are low-carbon, climate-resilient, and aligned with wider sustainability goals.
	New City Plan: Ambition and Objectives Consultation 2023.	Ref. 31	The updated plan is relevant for addressing climate change. It promotes renewable energy integration, higher energy efficiency standards, and sustainable construction practices. The plan includes advanced flood risk management with SuDS, enhances green infrastructure to support biodiversity and resilience, and encourages sustainable transport options like public transport, cycling, and walking. Additionally, it requires new developments to incorporate climate resilience features and focuses on protecting natural habitats. These updates ensure future

Local authority	Relevant local policy	Reference	Relevance to the assessment
			developments in Milton Keynes align with climate change mitigation and adaptation goals, fostering a sustainable, low-carbon, and resilient urban environment.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: • Policy S1 - Sustainable Development for Aylesbury Vale; • Policy NE1 Biodiversity and Geodiversity; • Policy C3 - Renewable Energy; • Policy I1 - Green Infrastructure; and • Policy I4 - Flooding.	Ref. 32	In summary the plan addresses climate change by promoting renewable energy, enhancing green infrastructure, protecting biodiversity and managing flood risks. These policies ensure that new developments contribute to climate change mitigation and adaptation, fostering a sustainable and resilient community.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives.	Ref. 33	The updated plan is relevant for addressing climate change, promoting renewable energy integration, higher energy efficiency standards, and sustainable construction practices. It includes advanced flood risk management with SuDS, enhances green infrastructure for biodiversity and resilience, and encourages sustainable transport options like public transport, cycling, and walking. Additionally, it requires new developments to incorporate climate resilience features and focuses on protecting natural habitats, ensuring future developments contribute to climate change mitigation and adaptation, fostering a sustainable, low-carbon, and resilient community.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035:	Ref. 34	The Central Bedfordshire Local Plan 2015 to 2035 addresses climate change by promoting energy efficiency, renewable energy, effective flood risk management, and sustainable construction. It also encourages sustainable

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy CC1 - Climate Change and Sustainability; • Policy CC2 - Sustainable Energy Development; • Policy CC3 - Flood Risk Management; • Policy CC4 – Development close to Watercourses; and • Policy CC5 – Sustainable Drainage.		transport, ensuring that new developments reduce climate impacts and enhance resilience, supporting a sustainable and adaptable future for the area.

Guidance and Standards

10.2.9 Relevant guidance and standards which have been used as part of the scoping process are listed below and will also be taken into account when carrying out the climate assessment:

- a. Planning Practice Guidance: Climate Change (Ref. 35);
- b. IEMA: Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (Ref. 1);
- c. The GHG Protocol (World Resources Institute and World Business Council for Sustainable Development (WRI & WBCSD) (Ref. 36);
- d. IEMA: Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (Ref. 2);
- e. University of Bath: Inventory of Carbon and Energy (ICE), Version 4 (Ref. 37);
- f. PAS 2080: 2023 Carbon management in buildings and infrastructure (Ref. 38);
- g. UK Water Industry Research: Supporting Whole Life Carbon Reduction (Ref. 39); and
- h. UK Climate Change Risk Assessment 2022 (CCRA3) (Ref. 40).

10.3 Consultation

10.3.1 During non-statutory consultation, the following topics were raised and will be considered as part of the scope of assessment:

- a. Low water flows and the release of GHGs;
- b. The risk of water transfer schemes becoming redundant if rainfall patterns change due to climate change; and
- c. Concerns regarding more frequent and intense flood events as a result of climate change.

10.4 Study Area

Greenhouse Gas Impact Assessment

10.4.1 The study area for the GHG impact assessment will include:

- a. Direct GHG emissions arising through demolition/as a result of the site clearance/ remediation (for site establishment only, not decommissioning), construction, operation and maintenance of the Proposed Development within the EIA Scoping Boundary; and
- b. Indirect GHG emissions attributed to the Proposed Development occurring outside the EIA Scoping Boundary, including embodied carbon in materials, transportation, waste processing, and waste disposal.

Climate Change Risk Assessment

- 10.4.2 The study area for the Climate Change Risk Assessment (CCRA) is the EIA Scoping Boundary (including all assets and staff on site) during the construction and operation of the Proposed Development.

In-Combination Climate Change Impact Assessment

- 10.4.3 The study area for the In-Combination Climate Change Impact (ICCI) Assessment will be determined by other EIA topic assessments, as described in other chapters of this EIA Scoping Report and to be reported in the ES. The other relevant topic chapters in this EIA Scoping Report include:
- a. **Chapter 8: Agriculture and Soils;**
 - b. **Chapter 11: Cultural Heritage;**
 - c. **Chapter 12: Ecology – Aquatic;**
 - d. **Chapter 13: Ecology – Terrestrial;**
 - e. **Chapter 14: Ground Conditions;**
 - f. **Chapter 15: Human Health;**
 - g. **Chapter 17: Major Accidents and Disasters;**
 - h. **Chapter 20: Traffic and Transport;**
 - i. **Chapter 21: Waste and Materials; and**
 - j. **Chapter 22: Water Environment and Flood Risk.**

10.5 Baseline Conditions

Existing Baseline

Greenhouse Gas Impact Assessment

- 10.5.1 In line with IEMA guidance (Ref. 1), the existing baseline for the GHG Impact Assessment is the business as usual scenario where the Proposed Development is not developed and the existing site (i.e., land use and assets within the EIA Scoping Boundary) remains unchanged.
- 10.5.2 The GHG baseline will be established by identifying existing GHG emissions sources within the EIA Scoping Boundary, assuming that the Proposed Development does not progress.
- 10.5.3 The baseline for the GHG impact assessment will include the emissions associated with any operational activities from existing infrastructure within the EIA Scoping Boundary. Where available, data will be used to quantify these GHG emissions. However, given the scale of the Proposed Development, the GHG impact assessment will focus on developing a 'business as usual' scenario that represents current operations, against which the Proposed Development will be assessed. The specific infrastructure included and the practical approach for gathering this data will be defined at the assessment stage.
- 10.5.4 Where data is unavailable, benchmarks and estimates will be used based on professional judgement. However, if no benchmarks or estimates are

available for existing operations within the EIA Scoping Boundary, a baseline with no GHG emissions from the EIA Scoping Boundary will be used for a worst-case assessment of the effects of the Proposed Development.

Climate Change Risk and In-Combination Climate Change Impact assessments

- 10.5.5 The current baseline has been determined by examining historical climate data for the EIA Scoping Boundary and its surrounding area, sourced from the Met Office website. Data from the Coleshill (Warwickshire) meteorological station (Ref. 41), located approximately 5 km from the Minworth AWTP, provides climate averages for the period 1981-2010, as summarised in **Table 10-4**. Additional historical climate data will be collected to inform the CCRA and ICCI Assessments during the assessment, with data gathered from supplementary locations covering the whole extent of the Proposed Development.

Table 10-4: Historic climate data for the Proposed Development location (Ref. 41)

Climatic Variable	Baseline data (1981-2010)
Mean annual maximum daily temperature (°C)	13.76
Warmest month on average (°C)	July (21.76)
Coldest month on average (°C)	February (1.21)
Mean annual rainfall (mm)	712.41
Wettest month on average (mm)	October (73.11)
Driest month on average (mm)	February (43.80)

Future Baseline

- 10.5.6 In addition to the existing baseline outlined above, a desk-based study will be undertaken to inform the future baseline characterisation on which the impact assessment will be based.
- 10.5.7 No surveys will be required for the GHG Impact Assessment, CCRA and the ICCI Assessment. The principal data sources used to inform the future baseline conditions are outlined below.

Greenhouse Gas Impact Assessment

- 10.5.8 The future baseline for the assessment of the impact of the Proposed Development on climate change is a projected 'business as usual' scenario where the Proposed Development is not constructed.
- 10.5.9 A scenario where the Proposed Development is consented will be calculated and compared to the future baseline scenario to calculate the life cycle GHG emissions impact of the Proposed Development.
- 10.5.10 The scenario without the Proposed Development provides a future baseline against which the GHG emissions impact with the Proposed Development can be assessed. This future baseline will extend across the Proposed Development's construction and operational phases.

10.5.11 For this GHG Impact Assessment, the future baseline would consist of terrestrial carbon stocks associated with current land use practices and operational emissions from any existing assets within the EIA Scoping Boundary.

Climate Change Risk and In-Combination Climate Change Impact assessments

10.5.12 The future baselines for across the life cycle of the Proposed Development will be based on UK Climate Projection 2018 (UKCP18) data from the Met Office for the 25 km grid squares in which the Proposed Development is located. A summary for the Minworth AWTP location is presented within **Table 10-5** below. Multiple 25 km grid squares will be used during the climate assessment to account for the different infrastructure elements included within the Proposed Development.

10.5.13 UKCP18 uses a range of possible scenarios, classified as Representative Concentration Pathways (RCPs), to inform differing future emission trends. These RCPs “...specify the concentrations of greenhouse gases that will result in total radiative forcing increasing by a target amount by 2100, relative to preindustrial levels” (Ref. 42). RCP8.5 is considered to be the worst-case global scenario with the greatest concentration of GHGs in the atmosphere and has been used as the purposes of this assessment as a worst-case scenario.

Table 10-5: Climate Change Baseline and Projection (Ref. 41)

Climatic Variable	Baseline data	Projection (change) (RCP 8.5)				Projected Trend	Source
	1981-2010	2020-2049	2040-2069	2070-2099	Beyond 2100		
Temperature							
Mean annual maximum daily temperature	13.8°C	+1.0°C (+0.4°C to +1.6°C)	+1.8°C (+0.9°C to +2.8°C)	+3.6°C (+2.0°C to +5.3°C)	No projection data is available, trend towards increasing temperatures is expected to continue.	↑	UKCP18
Mean summer maximum daily temperature	20.7°C	+0.5°C (+1.4°C to +2.2°C)	+2.5°C (+1.1°C to +3.8°C)	+4.9°C (+2.5°C to +7.4°C)		↑	UKCP18
Mean winter minimum daily temperature	1.4°C	+0.9°C (+0.1°C to +1.7°C)	+1.6°C (+0.5°C to +2.8°C)	+3.0°C (+1.2°C to +4.9°C)		↑	UKCP18
Number of days of air frost per annum	50	Reports have shown that the number of frost air and ground frost days have decreased since the 1960s. Combined with detailed studies, these long-term trends point to a long-term warming trend of the UK's climate and a reduction in cold events.				↓	Met Office
Warmest month on average	July (21.8°C)	+1.6°C (+0.4°C to +2.7°C)	+2.8°C (+1.1°C to +4.5°C)	+5.8°C (+2.6°C to +8.9°C)	No projection data is available, trend towards increasing temperatures is expected to continue.	↑	UKCP18
Coldest month on average	February (1.2°C)	+0.8°C (+0.0°C to +1.7°C)	+1.6°C (+0.3°C to +2.9°C)	+2.9°C (+0.8°C to +4.9°C)		↑	UKCP18
Precipitation							

Climatic Variable	Baseline data	Projection (change) (RCP 8.5)				Projected Trend	Source
	1981-2010	2020-2049	2040-2069	2070-2099	Beyond 2100		
Mean annual rainfall	712.4mm	+0.8% (-4.8% to +6.5%)	-1.1% (-8.0% to +5.7%)	+0.3% (-10.2% to +10.3%)	No projection data available, but there is potential for the overall trend in increased rainfall to continue.	↑↓	UKCP18
Mean summer rainfall	59.8mm	-7.4% (-26.7% to +10.9%)	-16.4% (-41.4% to +8.7%)	-32.8% (-61.2% to +0.9%)	No projection data is available. It is possible for the decrease in summer rainfall trend to continue.	↓	UKCP18
Mean winter rainfall	58.1mm	+5.8% (-3.6% to +15.8%)	+8.0% (-3.7% to +22.0%)	+19.3% (-0.3% to +43.4%)	No projection data is available, an increase in winter rainfall is possible.	↑	UKCP18
Wettest month on average	October (73.1mm)	+5.0% (-17.1% to +27.6%)	+13.1% (-15.9% to +41.1%)	+18.3% (-18.5% to +56.8%)	No projection data is available.	↑	UKCP18
Driest month on average	February (43.8mm)	+8.6% (-6.8% to +25.4%)	+10.8% (-11.2% to +34.3%)	+19.0% (-12.2% to +55.0%)	No projection data is available.	↑	UKCP18
Other							
Droughts	The Met Office has projected a trend towards drier summers on average, with the trend being stronger under a high GHG emission scenario compared to a					↑	Met Office

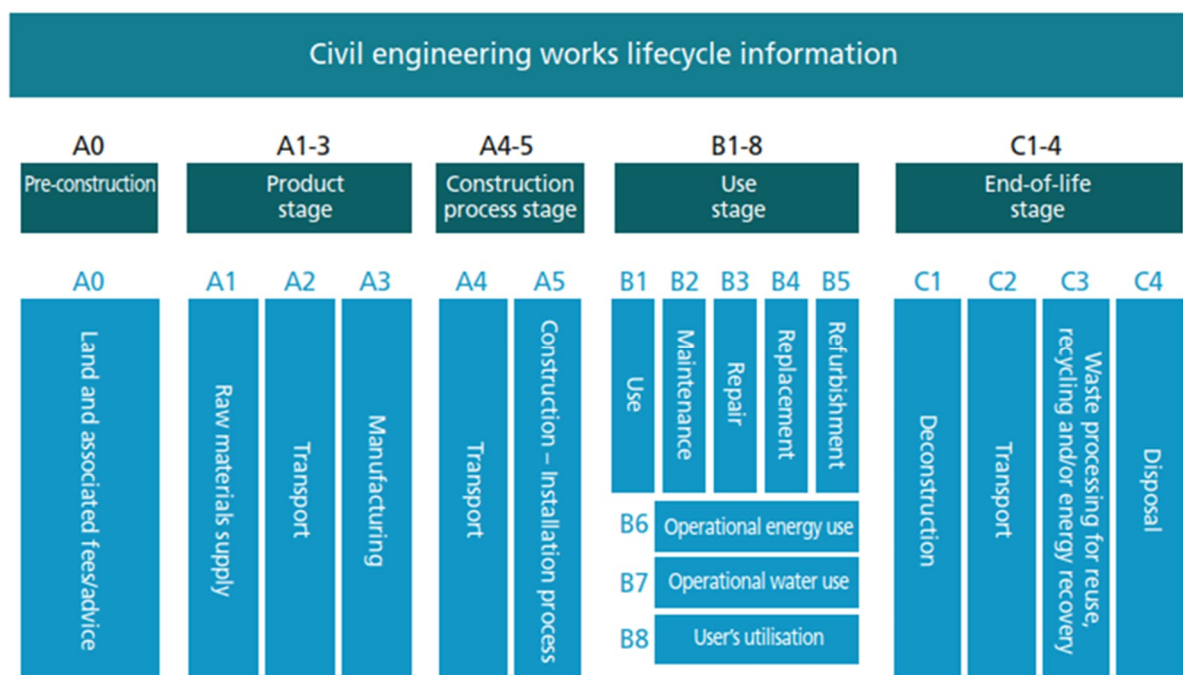
Climatic Variable	Baseline data	Projection (change) (RCP 8.5)				Projected Trend	Source
	1981-2010	2020-2049	2040-2069	2070-2099	Beyond 2100		
	low one, however, it is the distribution of rainfall throughout the seasons that will determine UK drought risk.						
Storms	Climate change is expected to lead to more frequent and intense winter storms across the UK. Summer storms are expected to become less frequent due to a northward shift of the jet stream.					↑	Met Office
Wildfires	The wildfire hazard is classified as high according to the information that is currently available to the Think Hazard tool (Ref. 45). This means that there is greater than 50% chance of experiencing weather that could support a hazardous wildfire that may poses some risk of life and property loss in any given year.					↑	Met Office

10.6 Potential Effects

Greenhouse Gas Impact Assessment

- 10.6.1 For the GHG Impact Assessment, the potential effect of the Proposed Development is the increase in GHG emissions to the global atmosphere. Increasing GHG emissions contribute to global climate change; this is already contributing to a diverse and wide-range of impacts on the environment and society. Known effects of climate change include the increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, sea level rise, and ocean acidification. These effects are largely accepted to be negative, transboundary, and cumulative from many global actions.
- 10.6.2 **Plate 10-1** below shows the life cycle stages of the civil engineering works assessment within the PAS 2080:2023 Guidance (Ref. 38), this has been used to inform the scope and reporting framework for the GHG impact assessment.

Plate 10-1: Life cycle stages of civil engineering works assessment (adapted from PAS 2080:2023)



- 10.6.3 On the basis of the model shown in **Plate 10-1**, in-scope activities associated with the Proposed Development that could result in GHG emissions are presented in **Table 10-6**.

Table 10-6: Potential effects from the GHG Impact Assessment of the Proposed Development

Life cycle stage	PAS 2080:2023 Module	PAS 2080:2023 Sub-Module	Primary emission sources	Scoped In / Out
Pre-construction	A0	Land and associated fees/advice	Activities in A0 include, but are not limited to, non-physical processes before construction, such as preliminary studies, impact assessments, risk assessments, stakeholder engagement, design and technical studies, product/material tests, site surveys and acquisition of land and design.	In
Product stage	A1 – A3	Raw material extraction and manufacturing of products that are required to build the equipment for the Proposed Development. Transportation of materials for such processes/ manufacturing (where available).	Embodied GHG emissions from energy use in the extraction of materials and manufacture of components and equipment. GHG emissions from the transportation of products and materials during their processing and manufacture.	In
Construction process stage	A4	Transportation of construction materials to the EIA Scoping Boundary.	Transport of construction materials is included under the construction process stage, where these are not included in embodied GHG emissions.	In
	A5	On-site construction activity. Transport of construction workers.	GHG emissions from energy (electricity, fuel, etc.) consumption for plant and vehicles, and generators on site. GHG emissions from fuel use for worker commuting. GHG emissions from disposal of waste.	In

Life cycle stage	PAS 2080:2023 Module	PAS 2080:2023 Sub-Module	Primary emission sources	Scoped In / Out
		Disposal of any waste generated during the construction processes.	GHG emissions from fuel consumption for transportation of waste. Land use change during construction.	
Operation stage	B1 – B8	Energy use from operation of the Proposed Development. Maintenance activities. Manufacture and use of chemicals in the water treatment process.	GHG emissions from the use of grid electricity. GHG emissions associated with maintenance activities (e.g. replacement components and fuel use). GHG emissions associated with chemical use during the water treatment process. Process emissions of methane and nitrous oxide from on-site activities. GHG emissions are associated with the transportation of workers from operational sites.	In
Decommissioning stage	C1 – C4	On-site decommissioning activity. Transportation and disposal of waste materials. Transportation of workers.	Energy (e.g., electricity, fuel) consumption from plant, vehicles, and generators within the site. GHG emissions from disposal and transportation of waste. GHG emissions from the transportation of workers to the site. Land use change during decommissioning work.	Out – Decommissioning has been scoped out in line with Section 6.5 of Chapter 6 EIA Approach .

Climate Change Risk Assessment

10.6.4 **Table 10-7** details the scoped-in climate change risks to the Proposed Development based on the UKCP18 projections.

Table 10-7: Potential scoped in effects related to climate change risk

Climate Parameter	Rationale for Scoping Opinion	Scoped In / Out
Extreme weather events	The Proposed Development may be vulnerable to extreme weather events such as heatwaves, drought, wildfires, storm damage to structures and assets.	In
Temperature	Increased temperatures may increase the cooling requirements of the Proposed Development and could impact the structural integrity of buildings and materials.	In
Precipitation	Some parts of the Proposed Development may be located in areas of elevated flood risk. The Proposed Development may be vulnerable to changes in precipitation, such as damage to structures, materials, and drainage systems during periods of heavy precipitation.	In
Wildfire	The wildfire hazard is classified as high according to the information that is currently available to the Think Hazard tool (Ref. 45). This means that there is greater than 50% chance of experiencing weather that could support a hazardous wildfire that may pose some risk to the Proposed Development.	In
Wind	There is currently no evidence to suggest that climate change is increasing high wind events. The UK Climate report (Ref. 47) states that there are “...no compelling trends in storminess when considering maximum gust speeds over the last five decades.” However, due to the lack of credible data, the effects of increased wind strength will be considered qualitatively.	In
Sea Level Rise	Sea-level rise has been scoped out as the Proposed Development is located inland.	Out

In-Combination Climate Change Impact Assessment

10.6.5 The ICCI assessment will consider how the resilience of various receptors in the surrounding environment (such as local waterways or local heritage assets) are affected by the Proposed Development in combination with future climatic conditions. Potential ICCI scoped into the assessment are presented in **Table 10-8**.

Table 10-8: Potential Effects related to the ICCI Assessment

Climate Parameter	Rationale for Scoping Conclusion	Scoped In / Out
Extreme weather events	Discipline receptors might be vulnerable to the in-combination impact of extreme weather events such as heatwaves, wildfires, storm damage to structures and assets and environmental impacts from the Proposed Development.	In
Temperature	Increased temperatures may increase the cooling requirements of the Proposed Development and could impact the structural integrity of buildings and materials. Therefore, discipline receptors might be vulnerable to the in-combination impact of temperature changes and environmental impacts from the Proposed Development.	In
Precipitation	Some parts of the Proposed Development may be located in areas at elevated risk of flooding. Discipline receptors might be vulnerable to the in-combination impact of changes in precipitation, such as damage to structures, materials, and any drainage systems during periods of heavy precipitation and environmental impacts from the Proposed Development.	In
Wildfire	The wildfire hazard is classified as high according to the information that is currently available to the Think Hazard tool (Ref. 45). This means that there is greater than 50% chance of experiencing weather that could support a hazardous wildfire that may pose some risk to the Proposed Development. The ICCI assessment will consider increased risk from wildfires on environmental receptors as a result of the impact on the Proposed Development.	In
Wind	There is no evidence to suggest that climate change is increasing high wind events. The UK Climate report (Ref. 47) states there are “... <i>no compelling trends in storminess when considering maximum gust speeds over the last five decades</i> ”. However, the effects of increased wind strength in-combination with the Proposed Development will be considered qualitatively by the EIA technical disciplines.	In
Sea Level Rise	Sea-level rise has been scoped out as the Proposed Development is located inland.	Out

10.7 Approach to Assessment

Greenhouse Gas Impact Assessment

General Approach

- 10.7.1 The GHG impact assessment will quantify the GHG emissions over the life cycle of the Proposed Development, excluding decommissioning.

10.7.2 The assessment will adopt a project life cycle approach to identify 'hot spots' of GHG emissions (i.e. the project stage[s] likely to generate the largest mass of GHG emissions) and enable priority areas for mitigation to be identified. This approach is consistent with the principles set out in IEMA guidance (Ref. 1).

10.7.3 In line with the World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) GHG Protocol guidelines (Ref. 36), the GHG impact assessment will be reported as tonnes of carbon dioxide equivalent (tCO₂e). It will consider the seven Kyoto Protocol gases:

- a. Carbon dioxide (CO₂);
- b. Methane (CH₄);
- c. Nitrous oxide (N₂O);
- d. Sulphur hexafluoride (SF₆);
- e. Hydrofluorocarbons (HFCs);
- f. Perfluorocarbons (PFCs); and
- g. Nitrogen Trifluoride (NF₃).

10.7.4 Expected GHG emissions arising from the construction and operation phases will be quantified using a calculation-based methodology as per the following equation and aligned with the GHG Protocol (Ref. 36):

$$\text{Activity data} \times \text{GHG emissions factor} = \text{GHG emissions}$$

10.7.5 The resulting carbon footprint will be compared to the existing baseline conditions to identify the impact of the Proposed Development.

10.7.6 If relevant GHG activity data are unavailable, GHG emissions will be estimated based on benchmarks or approximations. Where quantification is not possible, the assessment will be qualitative. Any assumptions, inclusions and exclusions that inform the GHG emissions calculation will be clearly described.

10.7.7 The Inventory of Carbon and Energy (ICE) database v4 (Ref. 37) and Greenhouse Gas Reporting: Conversion Factors 2024 (Ref. 43) published by UK Government will be used to inform the GHG Impact Assessment. To inform the GHG Impact Assessment, it may be necessary to research specific emission factors related to chemical usage in the water treatment process during the operation of the Proposed Development. These will be presented and justified in the assessment.

10.7.8 The global climate will be identified as the receptor for the purposes of the GHG impact assessment. The sensitivity of the climate to GHG emissions is 'high'. The rationale is as follows:

- a. GHG emission impacts could compromise the UK's Carbon Budget Delivery Plan (Ref. 11) sectoral construction and Net-Zero Pathways and, therefore, the ability to meet its future carbon reduction trajectory;

- b. Any additional GHG impacts could compromise the wider UK's ability to reduce its GHG emissions and, therefore, the ability to meet its future legally binding carbon budgets;
- c. The extreme importance of limiting global warming to below 2°C above industrial levels, while pursuing efforts to limit such warming to 1.5°C as set out in the Paris Agreement (Ref. 6) and a recent report by the Intergovernmental Panel on Climate Change (IPCC) (Ref. 48) highlighted the importance of limiting global warming below 1.5°C; and
- d. Disruption to the global climate already has diverse and wide-ranging impacts on the environment, society, economic and natural resources. Known effects of climate change include increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound, global, likely, long-term to permanent, and are transboundary and cumulative from many global actions.

Sensitivity of Receptors

- 10.7.9 The receptor for GHG emissions is the global climate, as the effects of GHG emissions are not geographically constrained; all GHG emissions have the potential to result in a cumulative effector in the atmosphere. To assess the impact of GHG emissions from the Proposed Development, the UK carbon budgets will be used as a proxy for the climate.
- 10.7.10 GHG emissions arising during the construction phase will be contextualised² against the sectoral carbon budget for the construction sector as set out by the Carbon Budget Delivery Plan (Ref. 11) published by the UK Government.
- 10.7.11 During the operational phase, GHG emissions will originate from multiple sectors, making contextualisation challenging. Consequently, sector-specific budgets will not be used in the significance test for the Proposed Development. UK Carbon Budgets will be employed in the significance test to provide a broader context for assessing the impact.

Magnitude of Impact

- 10.7.12 The DESNZ 2024 emissions factors (Ref. 43) and embodied carbon data from the ICE Database V4.0 (Ref. 37) will be used as the source of emissions factors for calculating GHG emissions.
- 10.7.13 In GHG accounting, it is considered good practice to contextualise emissions against relevant pathways to net zero, such as pre-determined carbon budgets. Therefore, in line with IEMA GHG impact assessment guidance (Ref. 1), emission resulting from the Proposed Development will be contextualised against the UK carbon budgets (see **Table 10-9**) as proposed by the Climate Change Committee (CCC), agreed by Government, and ratified by parliament. This contextualisation will be applied in terms of both

² Contextualising emissions in line with IEMA guidance determines whether a project supports or undermines a trajectory towards net zero.

the sensitivity of the receptor and the magnitude of potential impacts, as appropriate.

10.7.14 In order to assess the Proposed Development's trajectory towards net zero by 2050, the CCC's Balanced Net Zero Pathway has been utilised in the absence of any nationally legally binding carbon budgets post-2037. In February 2025, the CCC advised the UK Government on the level of its 7th Carbon Budget (Ref. 44). The UK Government is expected to adopt the CCC's recommendations for the 7th Carbon Budget later in 2025. Beyond 2050, it is implied that the UK will remain at net zero.

10.7.15 The CCC balanced net-zero pathway is divided into 5-year periods post-2037 to match the previous six legally binding UK national carbon budgets. The proposed carbon budget periods derived from the net-zero pathway encompass the 8th and 9th indicative budget periods up to 2050 in line with the UK's 1.5-degree trajectory as detailed in **Table 10-9**.

10.7.16 However, it should be noted that the supplementary carbon budgets beyond 2037 have not been formally adopted by the UK Government or ratified by parliament. Therefore, they can only be used as an indicative measure to contextualise the Proposed Development's progress towards the UK net-zero trajectory.

Table 10-9: UK Carbon Budgets and Indicative Carbon Budgets Based Upon the CCC's Balanced Net-Zero Pathway

Carbon budget period	UK Carbon Budget (MtCO ₂ e)	Indicative Carbon Budgets based upon the CCC's balanced net-zero pathway (MtCO ₂ e)	Indicative CCC's Construction Carbon Budgets based upon the CCC's balanced net-zero pathway for Construction (MtCO ₂ e)
4 th (2023-2027)	1,950	-	254
5 th (2028-2032)	1,725	-	183
6 th (2033-2037)	965	-	95
7 th (2038-2042)	535 ³	-	34
8 th (2043-2047)	-	195	17
9 th (2048-2050)	-	17	9

Significance of effects

10.7.17 The IEMA guidance (Ref. 1) states that there are many different methods to evaluate quantified levels of GHG significance. The IEMA guidance does not consider standard EIA significance criteria to be appropriate to the assessments addressed within this chapter. Instead, the IEMA guidance

³ At the time this scoping report was produced, the levels set in the 7th Carbon Budget are only considered as advice from the CCC. These will not become legally binding until they are passed through Parliament, which is expected to happen later in 2025.

notes that professional judgement is required to contextualise a project's GHG impact.

10.7.18 The IEMA guidance states that mitigation should be considered from the outset and throughout the Proposed Development's lifetime while also helping deliver proportionate EIAs. Once the magnitude of emissions is determined, mitigation measures should be proposed. Any mitigation measures committed to within a proposed development must be included within the assessment.

10.7.19 The guidance describes five distinct levels of significance, which are not solely based on whether a project emits GHG emissions alone but on how the project makes a relative contribution towards achieving a science-based 1.5°C aligned transition towards net zero. The different significance levels are plotted against the UK's net zero compatible trajectory, as presented in **Table 10-10** to evaluate the Proposed Development's likely significance.

10.7.20 The effect of the Proposed Development can shift from significant to non-significant by incorporating mitigation measures that substantially improve on business as usual scenario and meet or exceed the science-based emissions trajectory of ongoing but declining emissions towards net zero.

Table 10-10: Definition of Levels of Significance

Significance Level	Effects	Description	Example in the IEMA guidance (Ref. 1)
Significant	Major adverse	A project that follows a 'business as usual' or 'do minimum' approach and is not compatible with the UK's net zero trajectory or accepted aligned practice or area-based transition targets. It is down to the practitioner to differentiate between the 'level' of significant adverse effects e.g., 'moderate' or 'major' adverse effects.	The project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
	Moderate adverse		The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects

Significance Level	Effects	Description	Example in the IEMA guidance (Ref. 1)
			falls short of fully contributing to the UK's trajectory towards net zero.
Not significant	Minor adverse	A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that. It may have residual emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78% reduction by 2035, thereby potentially avoiding significant adverse effects.	The project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
	Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory and has minimal residual emissions. This project is playing a part in achieving the rate of transition required by nationally set policy commitments.	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
Significant	Beneficial	A project that causes GHG emissions to be avoided or removed from the atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe	The project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-

Significance Level	Effects	Description	Example in the IEMA guidance (Ref. 1)
		climate change can be judged as having a beneficial effect.	project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

Climate Change Risk Assessment

General Approach

- 10.7.21 The CCRA will qualitatively assess the Proposed Development's resilience to climate change. This will be completed by identifying likely climate change risks on the assets of the Proposed Development across its lifetime.
- 10.7.22 The ES will provide a statement describing how the Proposed Development has been designed to improve its resilience to future climatic conditions.

Sensitivity

- 10.7.23 The receptor for the CCRA is the Proposed Development itself, including workers, infrastructure, and visitors.

Magnitude of Impact

- 10.7.24 As noted above, the CCRA will identify potential climate change risks on the Proposed Development and associated receptors. To quantify the impact magnitude of risks, the CCRA will consider the potential consequence and likelihood of occurrence of risks; this will take account of the mitigation measures incorporated into the Proposed Development's design.
- 10.7.25 The assessment will consider the UKCP18 climate projections across an 80-year period from 2020 to 2100 (i.e., covering the Proposed Development's construction and operational phases). The climate parameters to be considered in the CCRA during construction and operational phases of the Proposed Development include the following:
- Extreme weather events;
 - Temperature change;
 - Precipitation change;
 - Wildfires; and
 - Wind.
- 10.7.26 The following key terms and definitions relating to the CCRA will be used:
- Climate hazard – a weather or climate-related event, which has potential to do harm to environmental or community receptors or assets, for example, increased winter precipitation;
 - Climate change impact – an impact from a climate hazard which affects the ability of the receptor or asset to maintain its function or purpose;
 - Consequence – any effect on the receptor or asset resulting from the climate hazard having an impact;

- d. The criteria which will be used to determine the likelihood of a climate change hazard occurring are detailed in **Table 10-11**; and
- e. The event is defined as the climate event (such as heatwave), while the hazard is defined as an impact on the Proposed Development caused by the climate event (such as overheating of electrical equipment).

Table 10-11: Description of Likelihood for Climate Change Hazard

Level of likelihood of climate hazard	Qualitative description	Quantitative Description
Frequent	Likely that the event will occur many times (reoccurs frequently). Evidence/indications strongly suggests a transition from business as usual will occur with the impact anticipated to be substantial.	Climate projection ensemble mean for the percentage of years throughout the considered time period with an event occurrence is 100%.
Occasional	Likely that the event will occur sometimes (reoccurs infrequently). Evidence/indications suggests a transition from business as usual will occur with major impacts.	Climate projection ensemble mean for the percentage of years throughout the considered time period with an event occurrence is 50 - 99%.
Remote	Unlikely that the event will occur, but possible (has occurred rarely). Evidence/indications hint a transition from business as usual will occur although the impacts are anticipated to be minimal.	Climate projection ensemble mean for the percentage of years throughout the considered time period with an event occurrence is 25 - 50%.
Improbable	Very unlikely that the event will occur (not known to have occurred). There is little indication or evidence of a transition occurring.	Climate projection ensemble mean for the percentage of years throughout the considered time period with an event occurrence is < 25%.
Extremely improbable	Almost inconceivable that the event or transition will occur.	Climate projection ensemble mean for the percentage of years throughout the selected time period has an event occurrence of 0%.

10.7.27 Engagement will be undertaken with relevant EIA technical disciplines and the engineering design team to discuss the CCRA and identify mitigation measures for incorporation into the design of the Proposed Development.

10.7.28 The CCRA is qualitative and provides commentary on how the Proposed Development will be resilient to climate change within the context of current and predicted future climate conditions.

10.7.29 The likelihood of a climate impact occurring is based on the likelihood of the hazard occurring combined with the vulnerability of the Proposed Development; this will be concluded using professional judgement and in discussion with the design team. Embedded mitigation measures will also be considered, and a likelihood rating will be assigned as described in **Table 10-12**.

10.7.30 After identifying climate hazards, the likelihood and consequences will be assessed according to **Table 10-12** and **Table 10-13** respectively. The categories and descriptions provided below are based on the IEMA climate change resilience and adaptation guidance.

Table 10-12: Categories for the Likelihood of the Climate-Related Impact Occurring

Likelihood category	Description
High	Likelihood of climate hazard occurring is high and impact is always/ almost always going to occur.
Moderate	Likelihood of climate hazard occurring is high and impact occurs often or the likelihood of climate hazard occurring is moderate and impact is likely to occur always/ almost always.
Low	Likelihood of climate hazard occurring is high, but impact rarely occurs or the likelihood of climate hazard occurring is moderate and impact sometimes occurs or the likelihood of climate hazard occurring is low and impact is likely to occur always/ almost always.
Negligible	All other eventualities – highly unlikely but theoretically possible.

Table 10-13: Description of Consequences

Consequence of impact	Description
High	Significant disruption to construction and operations, unable to deliver services, resulting in high financial losses.
Moderate	Disruption to construction and operations and ability to deliver services, resulting in some financial losses/ cost implications.
Low	Minor disruption to construction and operations does not significantly impact the ability to deliver services.
Negligible	Negligible disruption to construction and operations, does not impact ability to deliver services.

Significance of Effects

10.7.31 The CCRA will assess the significance of effects by evaluating the combination of the likelihood of the climate-related impact occurring and the consequence, as per the risk assessment matrix in **Table 10-14**. The assessment will take into account confirmed design and mitigation measures (referred to as embedded mitigation).

Table 10-14: Significance of Effect Matrix

Measure of Consequence	Likelihood of climate-related impact occurring			
	Negligible	Low	Moderate	High
Negligible	Not Significant	Not Significant	Not Significant	Not Significant
Low	Not Significant	Not Significant	Not Significant	Significant
Moderate	Not Significant	Not Significant	Significant	Significant
High	Not Significant	Significant	Significant	Significant

In-Combination Climate Change Impact Assessment

General Approach

10.7.32 The study area for the ICCI assessment will be determined by the EIA topic assessments, as described in other technical sections of this EIA Scoping Report.

10.7.33 The ICCI assessment will consider how the resilience of various receptors in the surrounding environment (such as local waterways or local heritage assets) are affected by the Proposed Development in combination with future climatic conditions as sourced from UKCP18 projections. The impacts are considered for the construction and operational phases of the Proposed Development.

Sensitivity

10.7.34 The receptors for the ICCI assessment will be those the Proposed Development will impact. These impacts will be assessed in liaison with relevant EIA technical specialists responsible for preparing the applicable technical chapters.

Magnitude of impact

10.7.35 The likelihood of a climate impact occurring is based on likelihood of the hazard occurring combined with the vulnerability of the Proposed Development, using the professional judgement of the technical specialists responsible for preparing the applicable technical chapters and in discussion with the design team. Embedded mitigation measures will also be considered, and a likelihood rating will be assigned as described in **Table 10-11** and **Table 10-12**.

10.7.36 The likelihood of a climate risk occurring and the likelihood of an impact to a receptor will then be combined to determine the likelihood of an ICCI occurring. This is illustrated in **Table 10-15**.

Table 10-15: Level of likelihood of the climate-related impact occurring.

Level of likelihood of climate impact occurring	Definition of likelihood
High	Likelihood of climate hazard occurring is high and impact is always/almost always going to occur.
Moderate	Likelihood of climate hazard occurring is high and impact occurs often or the likelihood of climate hazard occurring is moderate and impact is likely to occur always/ almost always.
Low	Likelihood of climate hazard occurring is high, but impact rarely occurs or the likelihood of climate hazard occurring is moderate and impact sometimes occurs or the likelihood of climate hazard occurring is low and impact is likely to occur always/ almost always.
Negligible	All other eventualities – highly unlikely but theoretically possible.

10.7.37 Once the likelihood of an ICCI has been identified, the assessment then considers how this will affect the significance of the identified effects.

10.7.38 The ICCI consequence criteria are defined in **Table 10-16** below and are based on the change to the significance of the impact already identified by the environmental discipline. To assess the consequence of an ICCI, each discipline has assigned a level of consequence to an impact based on the criteria description and their discipline assessment methodology.

Table 10-16: Consequence Criteria for In-Combination Climate Change Impact Assessment

Consequence	Consequence criteria
High	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/receptor, as defined by the topic, to increase from negligible, low, or moderate to major.
Moderate	The climate change parameter in-combination with the effect of the Proposed Development causes the effect defined by the topic to increase from negligible or low, to moderate.
Low	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of effect defined by the topic, to increase from negligible to low.
Negligible	The climate change parameter in-combination with the effect of the Proposed Development does not alter the significance of the effect defined by the topic.

Significance of Effects

10.7.39 The significance of potential effects will be determined using the matrix in **Table 10-14**. Where an effect has been identified as moderate or high will be

classed as a significant ICCI effect. If significant ICCI effects are likely, then appropriate additional mitigation measures (secondary mitigation) will be identified.

10.8 Assumptions, Limitations, and Uncertainties

- 10.8.1 It is assumed that necessary quantitative data will be available to inform the GHG impact assessment. Where quantitative data is not available, reasonable assumptions will be made and agreed upon with the project team.
- 10.8.2 Where it is neither possible to quantify the required data nor to use reasonable assumptions, a qualitative statement will be made on the environmental impact based on professional experience and expertise.
- 10.8.3 The UKCP18 data is limited to the projected period of 2100, and therefore, climate impacts beyond this time will not be presented in the ES. Due to the uncertainty of climate projection data beyond the end of the century, a general qualitative assessment will be made. The Proposed Development's life cycle will be confirmed during the assessment stage to align the CCRA with the appropriate timescales.

10.9 Approach to Mitigation

Greenhouse Gas Impact Assessment

- 10.9.1 The scope for mitigating climate change effects on and from the Proposed Development will be determined following the completion of the GHG impact assessment. Mitigation will focus on measures to reduce GHG emissions from the construction and operation of the Proposed Development, aligning with the UK Government's target to achieve net-zero emissions by 2050 and remain so thereafter.
- 10.9.2 For example, this may include utilising low-carbon energy sources to operate the Proposed Development and defining design principles to reduce embodied carbon associated with materials.
- 10.9.3 Reducing GHG emissions has played a key role in the optioneering process and design development to date. At each design stage, efforts have focused on prioritising low-carbon solutions and integrating sustainability into the Proposed Development's design principles. This has included evaluating the use of low-carbon energy sources for operating the Proposed Development and selecting design options that reduce embodied carbon in materials. These considerations are central to the decision-making process to ensure that any emissions are balanced throughout the project's life cycle, aligning with broader GHG reduction objectives.

Climate Change Risk Assessment and In-combination Climate Change Effects Assessments

- 10.9.4 The design team will inform the scope of mitigating measures for the CCRA and ICCI. These will focus on measures to increase the resilience of the Proposed Development and receptors in the surrounding environment to climate change impacts. This may include accounting for an increase in

surface water drainage flows within the design of the Proposed Development and specifying heat tolerant planting as part of landscaping.

10.10 References

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Chapter 11: Cultural Heritage

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11. Cultural Heritage

11.1 Introduction

11.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on cultural heritage (including built heritage and archaeology).

11.1.2 Cultural heritage aspects considered within this chapter include:

- a. Designated heritage assets: including Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, Registered Battlefields, World Heritage Sites and Conservation Areas; and
- b. Non-designated heritage assets: including archaeological, historic landscape character, buildings, and information on previous events (archaeological surveys and investigations) known at the time of writing.

11.1.3 Where appropriate, indirect effects relating to cultural heritage are considered within the other following technical chapters:

- a. Effects on valued habitats, primarily hedgerows and ancient woodland in relation to ecology, are also considered in **Chapter 13: Ecology – Terrestrial**;
- b. Effects on some historic landscape features, landscape character and valued views, including those from heritage assets, are considered in **Chapter 16: Landscape and Visual**;
- c. Assessment of noise and vibration effects on human receptors is considered in **Chapter 18: Noise and Vibration** and this may inform the understanding of potential physical changes and change to the setting of heritage assets;
- d. **Chapter 19: Socio-economics** considers effects on the local economy and labour market and on tourism businesses, and effects on human health arising from aspects including impacts on residential and community receptors and areas of recreation, and disruption to communities more widely;
- e. **Chapter 20: Traffic and Transport** considers changes in current traffic and transport and its effect on human receptors and may inform understanding of the change to setting of heritage assets; and
- f. **Chapter 22: Water Environment and Flood Risk** considers effects on hydrology, hydrogeology and flood risk and may inform understanding of indirect effects on heritage assets arising through change to the water environment.

11.1.4 This chapter is supported by:

- a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 11-1: Designated Assets**; and

ii. **Figure 11-2: Non-designated Assets.**

b. The following appendices in Volume 3 of this EIA Scoping Report:

i. **Appendix 11-1: Gazetteer of Designated Assets;** and

ii. **Appendix 11-2: Gazetteer of Non-designated Assets.**

11.2 Legislation, Planning Policy Context, and Guidance

11.2.1 Legislation, planning policy and guidance relating to the scope and method of cultural heritage assessment is outlined below.

Legislation

11.2.2 Legislation relevant to the historic environment provides legal protection for heritage assets of national significance as well as a mechanism by which such assets can be identified. Relevant historic environment legislation is listed below:

- a. Ancient Monuments and Archaeological Areas Act 1979, as amended by the National Heritage Act 1983 and 2002 (Ref. 1);
- b. Planning (Listed Buildings and Conservation Areas) Act 1990 (Ref. 2);
- c. The Hedgerows Regulations 1997, as amended by The Hedgerows (England) (Amendment) Regulations 2002 (Ref. 3); and
- d. The Infrastructure Planning (Decisions) Regulations 2010, Section 3 (Ref. 4).

National Policies, Plans and Strategies

11.2.3 The relevant national policies, plans and strategies for cultural heritage are summarised within **Table 11-1** below.

Table 11-1: National policies, plans and strategies – Cultural Heritage

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resource Infrastructure (NPSWRI) (Ref. 5)	The Historic Environment: Paragraphs 4.8.1 to 4.8.6 define the historic environment and its component parts (identified as having a degree of significance meriting consideration in planning decisions because of their historic interest), known as heritage assets, and sets out the requirement that effects of proposed development on the historic environment will be considered in determining applications for development consent.	A desk-based assessment (DBA) will be carried out and the results of this included in the cultural heritage chapter of the Environmental Statement (ES). The desk-based assessment will assess the significance of all relevant known heritage assets likely to be impacted by the Proposed Development, including setting of heritage assets where relevant.
	Applicant's Assessment: Paragraphs 4.8.7 to 4.8.10 set out the requirement for the applicant to provide an assessment of the effects of proposed developments on the historic environment and sets out requirements for the scope of the assessment and supporting information.	The assessment will include a review of the relevant Historic Environmental Records (HER) and Historic England's National Heritage List for England (NHLE) records, as well as an assessment of the potential for previously unrecorded archaeological remains to be present. Furthermore, it will assess the significance (i.e. sensitivity) of the surrounding historic landscape. The ES will report the potential likely significant effects of the Proposed Development on each individual asset.
	Mitigation: Paragraphs 4.8.11 to 4.8.14 discuss the use of investigative mitigation, stressing that a record of a heritage asset, while not as valuable as the retention of that heritage asset, will be required where a heritage asset is to be lost as a result of development. It also sets out the general requirements for such investigation to be carried out and disseminated in a timely fashion and to have regard to the need to identify and record previously unrecorded remains.	The ES will outline any embedded mitigation, management plans and best practice associated with preventing and minimising impacts on cultural heritage. A summary of additional mitigation measures will also be provided following the results of the impact assessment.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	Decision making: Paragraphs 4.8.15 to 4.8.29 set out the basic principle that any harm to heritage assets should be considered in determining an application for development consent and sets out guidance for weighting that harm proportionately to its magnitude and the significance of the heritage asset affected. Regardless of the magnitude of harm, great weight is to be placed on harm to significance of designated heritage assets and substantial harm to these assets should be 'exceptional' or 'wholly exceptional' in the case of designated heritage assets of the highest significance.	The design of the Proposed Development will seek to ensure that no designated asset will be removed or rendered unviable. Any harm to an asset will be clearly weighted and considered in the ES. The ES will also identify potential likely significant effects on the significance of non-designated assets arising from the Proposed Development.
National Planning Policy Framework (NPPF) (Ref. 6)	Section 16 of the NPPF deals specifically with the historic environment. Where changes are proposed, the NPPF sets out a clear framework to ensure that heritage assets are conserved, and where appropriate enhanced, in a manner that is consistent with their significance.	A DBA will be carried out and the results of this included in the cultural heritage chapter of the ES. The DBA will assess the significance of all relevant known heritage assets likely to be impacted by the Proposed Development, including setting of heritage assets where relevant.
	The NPPF sets out the importance of being able to assess the significance of heritage assets that may be affected by a proposed development. Significance is defined in Annex 2 as being the "...value of a heritage asset to this and future generations because of its heritage interest... That interest may be archaeological, architectural, artistic, or historic." Significance is not only derived from an asset's physical presence, but also from its setting. The setting of a heritage asset is defined in Annex 2 as "...the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve."	A DBA will be carried out and the results of this included in the cultural heritage chapter of the ES. The DBA will assess the significance of all relevant known heritage assets likely to be impacted by the Proposed Development, including setting of heritage assets where relevant.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	Paragraph 207 states that in determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the asset's importance and no more than is sufficient to understand the potential impact of the proposal on their significance. Similarly, Paragraph 208 includes a requirement on local planning authorities, having assessed the particular significance of any heritage asset that may be affected by a proposal, to take this into account when considering the impact of a proposal on a heritage asset.	A DBA will be carried out and the results of this included in the cultural heritage chapter of the ES. The DBA will assess the significance of all relevant known heritage assets likely to be impacted by the Proposed Development, including setting of heritage assets where relevant.
	In determining planning applications, local planning authorities should take account of the following points: • The desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation; • The positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and • The desirability of new development making a positive contribution to local character and distinctiveness (Paragraph 210).	Opportunities for enhancement will be considered as part of the cultural heritage chapter of the ES (e.g. outreach and community engagement).
	Paragraphs 212 to 216 introduce the concept that heritage assets can be harmed or lost through alteration, destruction, or development within their setting. This harm ranges from less than substantial through to	The design of the Proposed Development will seek to ensure that no designated asset will be removed or rendered unviable. Any harm to an asset, which needs to feature in the planning balance, will be

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	substantial. Regarding designated assets, Paragraph 212 states that great weight should be placed on their conservation, irrespective of whether any potential harm is considered to be substantial or less than substantial. It goes further to say that the more important the asset, the greater the weight should be on their conservation. In Paragraph 213, a distinction is made in respect of those assets of the highest significance (e.g., Scheduled Monuments, Grade I and Grade II* Listed Buildings) where substantial harm to or loss should be exceptional.	clearly set out in the cultural heritage chapter of the ES.
	Paragraph 214 states that in instances where development would cause substantial harm to or total loss of significance of a designated asset, consent should be refused unless it can be demonstrated that it is necessary to achieve substantial public benefits that outweigh that harm or loss. Paragraph 215 states in instances where development would cause less than substantial harm to the significance of a designated asset, the harm should be weighed against the public benefits of the proposal to provide a balanced judgement.	The design of the Proposed Development will seek to ensure that no designated asset will be removed or rendered unviable. Any harm to an asset, which needs to feature in the planning balance, will be clearly set out in the cultural heritage chapter of the ES.
	Regarding non-designated assets, Paragraph 216 states that the effect of the application on the significance of the asset should be considered in determining the application. A balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.	The assessment will include a review of the relevant HER records, as well as an assessment of the potential for previously unrecorded archaeological remains to be present. Furthermore, it will assess the significance (i.e. sensitivity) of the surrounding historic landscape. The cultural heritage chapter of the ES will assess the potential likely significant effects of the Proposed Development on each individual asset.

Local Policy

- 11.2.4 The relevant local policies listed in **Table 11-2** are both important and relevant to the scope and method and assessment of potential cultural heritage effects.

Table 11-2: List of relevant local policy – Cultural Heritage

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • Policy PG3: Place making (page 31); • Policy GA6: Peddimore (page 52); and • Policy TP12: Historic Environment (page 146).	Ref. 7	The design of the Proposed Development will ensure that any potential impacts on the historic environment – archaeology, built heritage, conservation areas and historic landscapes – are identified, assessed and mitigated where practicable.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • Policy LP2 – Settlement Hierarchy (pages 27-28); • Policy LP15 – Historic Environment, (pages 49-50); • Policy H2 – Land to the north-west of Atherstone, off Whittington Lane, (pages 84-85), outside Study Area but in close proximity.	Ref. 8	
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: • Policy BE4 – Valuing and conserving our historic environment.	Ref. 9	
Coventry City Council	Coventry Local Plan (2011-2031): • Policy HE2 – Conservation and Heritage Assets	Ref. 10	

Local authority	Relevant local policy	Reference	Relevance to the assessment
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: • Policy DS8 – Southwest Rugby; and • Policy SDC3 – Protecting and Enhancing the Historic Environment.	Ref. 11	
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: • Policy BN5 – The Historic Environment and Landscape.	Ref. 12	
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: • Policy Q3 – Carbon reduction, community energy networks, sustainable design and construction, and water use; and • Policy ENV6 – Protection and enhancements of designated and non - designated heritage assets.	Ref. 13	
Milton Keynes City Council	Plan: MK 2016 – 2031: • Policy HE1 – Heritage and Development.	Ref. 14	
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: • Policy BE1 – Heritage assets.	Ref. 15	
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035:	Ref. 16	

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy HE1 – Archaeology and Scheduled Monuments; • Policy HE2 – Historic Parks and Gardens; and • Policy HE3 – Listed Buildings, Conservation Areas and Built Heritage.		

Guidance and Standards

11.2.5 Relevant guidance and standards which have been applied as part of the scoping process are listed below and will be taken into account as part of the EIA include:

- a. Planning Practice Guidance (PPG): Historic Environment (Ref. 17);
- b. Historic Environment, Good Practice Advice in Planning Note 2. Managing Significance in Decision Taking in the Historic Environment. Historic England (Ref. 18);
- c. Historic Environment, Good Practice Advice in Planning Note 3. The Setting of Heritage Assets. Historic England (2nd edition, 2017) (Ref. 19);
- d. Historic Environment, Statement of Heritage Significance: Analysing Significance in Heritage Assets. Historic England Advice Note 12. Historic England (Ref. 20);
- e. Chartered Institute for Archaeologists (CIfA), Standard and Guidance for Historic Environment Desk-Based Assessment (Ref. 21);
- f. CIfA, Code of Conduct: professional ethics in archaeology (Ref. 22); and
- g. Institute of Environmental Management and Assessment (IEMA), the Institute of Historic Building Conservation (IHBC) and the CIfA, Principles of Cultural Heritage Impact Assessment in the UK (Ref. 23).

11.3 Consultation

11.3.1 A summary of key topics raised during non-statutory consultation with regards to cultural heritage is provided below:

- a. Potential impacts on heritage buildings and structures;
- b. Potential impacts on known archaeological remains and areas; and
- c. Potential impacts of the Historic Landscape Characteristics of districts / parishes.

11.3.2 Further engagement will be undertaken post-EIA Scoping at the PEIR and ES stages with relevant stakeholders to obtain any available information to supplement the assessment and seek their views on the evolving design of the Proposed Development with regards to cultural heritage.

11.3.3 Historic England will be consulted throughout the EIA process (beyond EIA Scoping) as the statutory body for the historic environment.

11.3.4 In addition, engagement will be undertaken with other stakeholders to ensure that local specialist views and expertise can be considered as part of the EIA and the evolving design of the Proposed Development with regards to cultural heritage. These include historic environment officers from Birmingham City Council, North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Coventry City Council, Rugby Borough Council, West Northamptonshire Council, Milton Keynes City Council, Buckinghamshire Council and Central Bedfordshire Council and local authority conservation officers as required.

11.4 Study Area

- 11.4.1 This section sets out the study areas adopted for each element of the Proposed Development.
- 11.4.2 The study area is the area within which heritage assets may experience effects as a result of the Proposed Development. Effects to heritage assets may arise during construction and operation. Effects to heritage assets may arise as a result of physical impacts to their fabric or through changes to their setting.
- 11.4.3 The study areas defined below take account of the guidance in 'The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning 3' (Ref. 19) and 'Standard and Guidance for Historic Environment Desk-Based Assessment' (Ref. 21) and professional judgement and experience on other similar projects. For the EIA, the study areas will be defined according to the significance of the asset and the potential impacts of the Proposed Development, following further assessment, design work and consultation.
- 11.4.4 For the purpose of this EIA Scoping Report, the study area has been defined as 500 m from the EIA Scoping Boundary for all designated and non-designated heritage assets for Parts 1b: Minworth to Atherstone Pipeline, Part 2: Works to the Coventry, Oxford and Grand Union Canals, Part 3: Daventry and Drayton Reservoirs and Part 4b: Pipeline to Underground Reservoir near Luton.
- 11.4.5 For Parts 1a: Minworth AWTP and 4a: Abstraction, Storage and Treatment Site, the study area for designated heritage assets has been defined as 1 km, and 500 m for non-designated heritage assets. The study area for designated heritage assets was extended as the proposed structures for the Minworth AWTP have a greater potential impact on setting and significance over a larger area due to their potential height and scale.
- 11.4.6 The study areas for designated and non-designated heritage assets are presented on **Figure 11-1** and **Figure 11-2** in Volume 2 of the EIA Scoping Report, respectively.

Summary

- 11.4.7 **Table 11-3** provides a summary of the study areas by Proposed Development Part.

Table 11-3: Summary of Study Areas – Cultural Heritage

Reference point	Study area
Part 1a: Minworth AWTP	• 1 km radius for designated heritage assets. • 500 m radius for non-designated heritage assets.
Part 1b: Minworth to Atherstone Pipeline	• 500 m radius for designated heritage assets. • 500 m radius for non-designated heritage assets.
Part 2: Works to the Coventry, Oxford and Grand Union Canals	• 500 m radius for designated heritage assets.

Reference point	Study area
	• 500 m radius for non-designated heritage assets.
Part 3: Daventry and Drayton Reservoirs	• 500 m radius for designated heritage assets. • 500 m radius for non-designated heritage assets.
Part 4a: Abstraction, Storage and Treatment Site	• 1 km radius for designated heritage assets. • 500 m radius for non-designated heritage assets.
Part 4b: Pipeline to Underground Reservoir near Luton	• 500 m radius for designated heritage assets. • 500 m radius for non-designated heritage assets.

11.5 Baseline Conditions

Data Sources

- 11.5.1 The known baseline historic environment resource described in this section has been informed by the following data sources:
- Historic England's NHLE;
 - The Birmingham City, Warwickshire, Coventry City, West Northamptonshire, Milton Keynes City, Buckinghamshire, Bedfordshire and Luton City HERs;
 - British Geological Survey geology viewer; and
 - Other readily available online sources.

Existing Baseline

- 11.5.2 This section provides a summary of the baseline conditions in respect of cultural heritage.
- 11.5.3 Assets are identified by their NHLE and HER reference numbers. The non-designated heritage assets are identified with numbers bearing the following prefixes in the different local authority areas: MBM (Birmingham); MWA (Warwickshire); MCT (Coventry); MNN (West Northamptonshire); MMK (Milton Keynes); MBC (Buckinghamshire) and MBD (Central Bedfordshire and Luton).
- 11.5.4 The non-designated heritage asset baseline search does not cover the entire 500 m study area due to late changes to the EIA Scoping Boundary. The increase in EIA Scoping Boundary resulted in minimal expansion to the study area, the focus of scoping is of non-designated heritage assets within the EIA Scoping Boundary. As the Proposed Development progresses, non-designated heritage asset data will be collated that takes into account the respective study area of the Proposed Development at the next key stages of EIA.
- 11.5.5 The non-designated heritage assets comprise both archaeological remains and built heritage assets. These are discussed separately in the baseline section below.

- 11.5.6 Several non-designated assets are recorded within the HERs as findspots. A 'findspot' is a chance find of archaeological evidence which is no longer within the context it was found in. Findspots inform the potential for associated archaeological remains, although because they are no longer *in-situ*, they are not considered extant assets and as such are scoped out of assessment.
- 11.5.7 The locations of all designated and non-designated heritage assets within the study areas defined above (see Section 11.3.3) are presented on **Figure 11-1** and **Figure 11-2** in Volume 2 of the EIA Scoping Report, respectively. This section should be read with reference to these figures and accompanying gazetteers presented in **Appendix 11-1** and **Appendix 11-2** (Volume 3 of the EIA Scoping Report).

Part 1a: Minworth AWTP

- 11.5.8 A previous DBA report was undertaken for the Severn Trent Minworth Sewage Treatment Works at Minworth (located partially in Part 1a) in December 2023 (Ref. 22)

Designated Assets

- 11.5.9 There are no designated heritage assets within the Part 1a EIA Scoping Boundary; however, there are the following two Grade II* Listed Buildings and 15 Grade II Listed Buildings within the 1 km study area:
- a. Church of St Nicholas and St Peter (Grade II*, NHLE 1185754); and
 - b. Water Orton Bridge (Grade II*, NHLE 1075812).
- 11.5.10 There is one Conservation Area within the 1 km study area: Water Orton Conservation Area (DWK4344).
- 11.5.11 There are no other designated heritage assets within the study area.

Non-designated Assets

- 11.5.12 There are 50 non-designated heritage assets within the Part 1a study area, including one record of a Neolithic polished stone axe, one record of a Bronze Age axe head, and six records of Roman pottery and cropmarks identified from aerial photography. Other non-designated heritage assets include medieval pottery and earthworks.
- 11.5.13 Two of these non-designated heritage assets are identified within the Part 1a EIA Scoping Boundary: a field name recorded on cartographic sources indicating possible earthworks at Castle Croft (MBM1655) and medieval to post-medieval ridge and furrow (MWA12047).
- 11.5.14 Of the 50 non-designated heritage assets identified within the study area, 13 have been recorded as findspots.
- 11.5.15 There are 21 non-designated built heritage assets within the study area, comprising post-medieval and modern buildings and structures.

Part 1b: Minworth to Atherstone Pipeline

Designated Assets

- 11.5.16 There are no designated heritage assets within the Part 1b EIA Scoping Boundary; however, there are two Scheduled Monuments within the study area: Drakenage Farm moated site, a fishpond and associated closes (NHLE 1013769) and a Double moated site 60 m east of Baxterley Church (NHLE 1014683) are approximately 410 m north-west and north respectively of the Part 1b EIA Scoping Boundary.
- 11.5.17 One Registered Park and Garden (Merevale Hall, Grade II*, NHLE 1001190) is located partly within the Part 1b EIA Scoping Boundary.
- 11.5.18 There are 32 Grade II Listed Buildings within the study area. The Listed Buildings located in closest proximity (less than 50 m) to the Part 1b EIA Scoping Boundary (from west to east) comprise the following:
- Ivy Cottage (Grade II, NHLE 1365232);
 - Bridge at SP 2197 9350 (Grade II, NHLE 1034651);
 - Hurley and Wood End War Memorial (Grade II, NHLE 1438051); and
 - Beehive Cottage (Grade II, NHLE 1185462).
- 11.5.19 There is one Conservation Area located within the Part 1b EIA Scoping Boundary: Atherstone Conservation Area (DWK4335).
- 11.5.20 There are no other designated heritage assets within the study area.

Non-designated Assets

- 11.5.21 There are 210 non-designated heritage assets within the study area, including: Mesolithic stone and flint tools, Neolithic flints and unspecified Bronze Age, Iron Age, Roman and early medieval artefacts. Non-designated assets from the medieval period comprise ridge and furrow, fields, earthworks and trackways, with residential and industrial buildings forming the majority of the post-medieval non-designated heritage assets. A tramway, a First World War (WW1) memorial and a landing ground within the study area have also been identified – the landing ground (MWA29858) at Dunton Hall was used from 1931 up until the outbreak of the Second World War (WW2) in 1939.
- 11.5.22 There are 24 non-designated heritage assets recorded within the Part 1b EIA Scoping Boundary. These range from prehistoric linear features near Newlands Farm (MWA12046), unspecified Roman artefacts found during metal detecting (MWA21303 and MWA21163), a chance find of a medieval spearhead near Tib Hall Farm (MWA4409) and cartographic evidence of the probable extent of the medieval settlement Lea Marston (MWA9524). Post-medieval non-designated heritage assets recorded within the EIA Scoping Boundary comprise no longer extant quarrying activity (MWA5812 and MWA5813), ridge and furrow (MWA12019) and transportation assets such as the tramway at Kingsbury (MWA33378).
- 11.5.23 Of the 210 non-designated heritage assets identified within the study area, 17 of which have been recorded as findspots.
- 11.5.24 There are 45 non-designated built heritage assets, comprising post-medieval and modern buildings and structures, within the study area. Of these, there are five non-designated built heritage assets located within Part 1b (from west to east), as presented in **Table 11-4**.

Table 11-4: Part 1b – Non-Designated Built Heritage Assets within EIA Scoping Boundary (North to South)

Asset Name and Reference
- Lea Bridge (over marsh), MWA61; - Lea Bridge (over Railway), Lea Marston MWA60; - Midland Railway (Kingsbury and Water Orton), MWA33182; - Halloughton Hall park / garden, Nether Whitacre, MWA12546; and - Bentley Lodge Bridge, MWA19925.

Part 2: Works to the Coventry, Oxford and Grand Union Canals and Part 3: Daventry and Drayton Reservoirs

11.5.25 This sub-section has been further informed by Historic England's 2017 research report (Ref. 24) and gazetteer (Ref. 25).

Designated Assets

11.5.26 There are nine Scheduled Monuments within 500 m of the Part 2 and 3 EIA Scoping Boundary:

- a. Roman villa south-east of Cosgrove Hall (NHLE 1003874);
- b. Site of Bannaventa (NHLE 1003879);
- c. Roman Camp (NHLE 1005736);
- d. Wolverton Iron Trunk Aqueduct (NHLE 1006934);
- e. Muscott deserted medieval village and double moated site (NHLE 1009555);
- f. The Benedictine Priory and Precinct of St Mary, Nuneaton (NHLE 1011033);
- g. Motte and bailey castle, 30 m east of St John the Baptist's Church (NHLE 1011368);
- h. Churchyard cross base in St John the Baptist's churchyard (NHLE 1016306); and
- i. Braunstonbury deserted medieval village, moat and fishpond (NHLE 1017580).

11.5.27 The closest Scheduled Monument (Churchyard cross base in St John the Baptist's Churchyard, NHLE 1016306) is approximately 130 m north-east of the Parts 2 and 3 EIA Scoping Boundary, within the study area.

11.5.28 There are three Grade I Listed Buildings, 31 Grade II* Listed Buildings and 378 Grade II Listed Buildings within 500 m of the Part 2 and 3 EIA Scoping Boundary. The Grade I and Grade II* Listed Buildings are as follows:

- a. Church of St Peter and St Paul (Grade I, NHLE 1040847);
- b. Church of the Holy Cross (Grade I, NHLE 1067696);
- c. Church of St Boltoph (Grade I, NHLE 1183970);
- d. Hartshill Grange (Grade II*, NHLE 1034749);
- e. Church of Saint John the Baptist (Grade II*, NHLE 1035023);

- f. Church of St James (Grade II*, NHLE 1034889);
- g. Church of St Mary the Virgin (Grade II*, NHLE 1040946);
- h. Church of St Peter and St Paul (Grade II*, NHLE 1041021);
- i. Church of St Michael and All Angels (Grade II*, NHLE 1041055);
- j. 7, New Street (Grade II*, NHLE 1054755).
- k. Moot Hall (Grade II*, NHLE 1067667);
- l. Former Weedon Barracks, East Lodge (Grade II*, NHLE 1076511);
- m. Former Weedon Barracks, Canal Enclosure Wall to North (Grade II*, NHLE 1076513);
- n. Former Weedon Barracks, Storehouse Number 5 (Grade II*, NHLE 1076514);
- o. Former Weedon Barracks, Storehouse Number 2 (Grade II*, NHLE 1076515);
- p. Former Weedon Barracks, Storehouse Number 8 (Grade II*, NHLE 1076516);
- q. Church of St Peter and St Paul (Grade II*, NHLE 1076520);
- r. Church of St Luke (Grade II*, NHLE 115981);
- s. Church of St Martin (Grade II*, NHLE 1125422);
- t. 11 and 13, Watling Street (Grade II*, NHLE 1125436);
- u. Beech House and Attached Railings (Grade II*, NHLE 1185175);
- v. Bridge Number 65 (Grade II*, NHLE 1190608);
- w. Stoneacre (Grade II*, NHLE 1189162);
- x. Former Weedon Barracks, Storehouse Number 3 (Grade II*, NHLE 1203495);
- y. Former Weedon Barracks, Storehouse Number 7 (Grade II*, NHLE 1203504);
- z. Former Weedon Barracks, Storehouse Number 6 (Grade II*, NHLE 1203512);
- aa. Former Weedon Barracks, Outer Walls and Northeast Bastion (Grade II*, NHLE 1281700);
- bb. Library at the Cedars School (Grade II*, NHLE 1321402);
- cc. Former Weedon Barracks, Outer Wall, South East and South West Bastions and Gate Piers to South East (Grade II*, NHLE 1342980);
- dd. Former Weedon Barracks, Storehouse Number 1 (Grade II*, NHLE 1342981);
- ee. Former Weedon Barracks, Storehouse Number 4 (Grade II*, NHLE 1342982);
- ff. Church of St John the Baptist (Grade II*, NHLE 1371587);
- gg. Ansty Hall (Grade II*, NHLE 1365084); and
- hh. Church of St Mary (Grade II*, NHLE 1365164).

11.5.29 There are 66 Listed Buildings (all Grade II) located within the Part 2 and 3 EIA Scoping Boundary which comprise (from north to south):

- a. Coventry Canal, Atherstone Top Lock and Basin Below to North West (Grade II, NHLE 1034782);
- b. Britannia Works (Grade II, NHLE 1184912);
- c. Bridge 37, Rawnhill Bridge at SP3120 9692 Coventry Canal (Grade II, NHLE 1251842);
- d. Milestone between Bridges 34 and 35 at SP 3197, Coventry Canal (Grade II, NHLE 1251841);
- e. Bridge 33 at SP 3257 9529, Coventry Canal (Grade II, NHLE 1262577);
- f. Covered Dock and Workshops at British Waterways Maintenance Depot (Grade II, NHLE 1034747);
- g. Cottage and Bridge approximately 75 metres east of covered dock and workshops at British Waterways Maintenance Depot (Grade II, NHLE 1365165);
- h. Bridge 30, Grange Road Bridge at SP 3317 9489 Coventry Canal (Grade II, NHLE 1251839);
- i. Milestone between Bridges 27 and 28 at SP 3432 9381, Coventry Canal (Grade II, NHLE 1261659);
- j. Engine House (Grade II, NHLE 1365077);
- k. Roving Bridge over Oxford Canal (Grade II, NHLE 1365056);
- l. Footbridge over junction of Coventry and Oxford Canals (Grade II, NHLE 1319924);
- m. The Greyhound Inn (Grade II, NHLE 1265692);
- n. 4-14, Sutton Stop (Grade II, NHLE 1226778);
- o. Canal Bridge No. 11 (Cater's Bridge), Oxford Canal (Grade II, NHLE 1034888);
- p. Oxford Canal, Morgan's Bridge at SP 442 799 (Grade II, NHLE 1276482);
- q. Oxford Canal, Fennis Field Bridge at SP 462 785 (Grade II, NHLE 1233718);
- r. Oxford Canal, Newbold Arm Bridge at SP 481 778 (Grade II, NHLE 1276494);
- s. Oxford Canal, Newbold Tunnel North Portal (Grade II, NHLE 1233660);
- t. Newbold Tunnel South Portal (Grade II, NHLE 1249971);
- u. Hillmorton Bottom Lock (Locks 2 and 3), Former Oxford Canal (Grade II, NHLE 1393797);
- v. Grand Union Canal, Little Braunston Dry Dock (Grade II, NHLE 134025);
- w. Grand Union Canal, Little Braunston Lock at Bridge Number 2, Grade II, NHLE 1343024;

- x. Grand Union Canal, Little Braunston Brasenose Chandlery (Grade II, NHLE 1076447);
- y. Grand Union Canal, West Entrance to Braunston Tunnel (Grade II, NHLE 1076445);
- z. Grand Union Canal Milepost at Norton Junction, Beside Tow Path of Leicester Branch of Grand Union Canal (Grade II, NHLE 1342978);
- aa. Grand Union Canal Bridge Number 10 at SP 602 656 (Grade II, NHLE 1251158);
- bb. Grand Union Canal Long Buckby Wharf Bridge Number 12 (Grade II, NHLE 1077032);
- cc. Grand Union Canal Long Buckby Wharf milepost approximately 16 metres from Lock Number 9 (Grade II, NHLE 1342699);
- dd. Bridge Number 14 over Grand Union Canal (Grade II, NHLE 1343005);
- ee. Milepost 3 metres west of Windlass Cottage by towpath of Grand Union Canal (Grade II, NHLE 1076488);
- ff. Bridge Number 27 at SP 644 590 Grand Union Canal (Grade II, NHLE 1286870);
- gg. Simon's Cottage (Grade II, NHLE 1371575);
- hh. Bridge Number 33 (Grade II, NHLE 1191420);
- ii. Bridge Number 42 (Grade II, NHLE 1041058);
- jj. Bridge Number 43 (Grade II, NHLE 1293813);
- kk. Bridge Number 45 (Grade II, NHLE 1371520);
- ll. Bridge Number 47 (Grade II, NHLE 1190453);
- mm. Milepost beside towpath of Grand Union Canal near junction with Northampton Arm (Grade II, NHLE 1041073);
- nn. Lock Number 1 on Northampton Arm of Grand Union Canal (Grade II, NHLE 1040997);
- oo. Northampton Top Lock Cottage (Grade II, NHLE 1191780);
- pp. Warehouse Adjoining North of Blisworth Mill (Grade II, NHLE 1052191);
- qq. Rookery Cottage (Grade II, NHLE 1040945);
- rr. The Boat Inn (Grade II, NHLE 1189664);
- ss. Lock Number 14 Stoke Top Lock (Grade II, NHLE 1040947);
- tt. Canal House (Grade II, NHLE 1371631);
- uu. Bridge Number 53 (Grade II, NHLE 1189617);
- vv. Lock Number 15 (Grade II, NHLE 1040948);
- ww. Lock Number 16 (Grade II, NHLE 1189628);
- xx. Lock Number 17 (Grade II, NHLE 1371612);
- yy. Lock Number 18 (Grade II, NHLE 1040949);
- zz. Lock Number 19 (Grade II, NHLE 1189639);
- aaa. Cottages Numbers 140 and 141 (Grade II, NHLE 1040950);

- bbb. Lock Number 20 Stoke Bottom Lock (Grade II, NHLE 1371613);
- ccc. Pump House (Grade II, NHLE 1125402);
- ddd. Canalside Cottage (Grade II, NHLE 1310679);
- eee. Lock (Grade II, NHLE 1125401);
- fff. Lock View Pine View (Grade II, NHLE 1332233);
- ggg. Grand Union Canal Bridge to North of Lock 23 (Grade II, NHLE 1320176);
- hhh. Grand Union Canal Talbot's Canal Lock 23 Grand Union Canal (Grade II, NHLE 115973);
- iii. Grand Union Canal Cottage at Lock 23 (Grade II, NHLE 1115974);
- jjj. Grand Union Canal Pumping Station to East of Lock 23 (Grade II, NHLE 1115975);
- kkk. Grand Union Canal Locks 24, 25 and 26 (Grade II, NHLE 1116006);
- lll. Grand Union Canal Pumping Station to north of Grand Union Canal at Three Locks (Grade II NHLE 1219325);
- mmm. Grand Union Canal Three Locks Cottage (Grade II, NHLE 1320150); and
- nnn. Leighton Lock Cottage Grand Union Canal (Grade II, NHLE 1300788).

11.5.30 There are 22 Conservation Areas within 500 m of the EIA Scoping Boundary. The Part 2 and Part 3 EIA Scoping Boundary is situated within the following Conservation Areas:

- a. Hawkesbury Junction (DCT33);
- b. Grand Union and Oxford Canal (DNN12301);
- c. Braunston (DNN12249);
- d. Daventry Reservoir (DNN12551);
- e. Weedon Bec (DNN19858);
- f. Grand Union Canal (DNN19699);
- g. Blisworth (DNN12243);
- h. Stoke Bruerne (DNN12369); and
- i. Cosgrove (DNN12268).

11.5.31 There are three Registered Parks and Gardens located within 500 m of the Part 2 and Part 3 EIA Scoping Boundary:

- a. Merevale Hall (Grade II*, NHLE 1001190), 230 m west;
- b. Brockhall Park (Grade II, NHLE 1001383), 65 m north-east; and
- c. Stoke Park (Grade II, NHLE 1001039), 250 m west.

Non-designated Assets

11.5.32 There are 2,963 non-designated heritage assets within the study area, including Mesolithic flints, Neolithic cropmarks, discrete features and artefacts, Bronze Age round barrows and artefacts, and Iron Age and Roman

discreet features, earthworks, artefacts and settlements. Early Medieval non-designated heritage assets identified include pottery, industrial features, earthworks and settlements. Medieval non-designated heritage assets identified include ridge and furrow, settlements, churches, earthworks and artefacts. Post-medieval non-designated heritage assets identified include ridge and furrow, bridges, artefacts, churches, industrial and residential buildings. Modern non-designated heritage assets identified include infrastructure buildings, bridges, WW2 defences, as well as industrial and residential buildings.

- 11.5.33 There are 467 non-designated heritage assets that are located within the Part 2 and Part 3 EIA Scoping Boundary. These range from the Prehistoric to the Modern period in date. Prehistoric assets recorded in the HER are from aerial photography analysis and definitive period cannot be ascertained. Watling Street Roman Road (MNN11430) and the Roman Road between Bannaventa and Duston (MNN14917) are located partially within the EIA Scoping Boundary. These roads are associated with Bannaventa Roman town and defences (MNN11584). A number of potential geoarchaeological assets are recorded within Part 3 (MNN142790 and MNN142802). A number of post-medieval and modern bridges over the Grand Union Canal and Oxford Canal are also located within the EIA Scoping Boundary.
- 11.5.34 Of the 2,963 non-designated heritage assets identified within the study areas, 252 have been recorded as findspots.
- 11.5.35 There are 405 non-designated built heritage assets, comprising post-medieval and modern buildings and structures, within 500 m of the EIA Scoping Boundary.
- 11.5.36 Of these, there are 136 non-designated built heritage assets located within the Part 2 and Part 3 EIA Scoping Boundary. **Table 11-5** lists these assets from north to south.

Table 11-5: Parts 2 and 3 – Non-Designated Built Heritage Assets within EIA Scoping Boundary (North to South)

Asset Name and Reference
• The Coventry Canal MWA4373; • Coleshill Road canal bridge, Atherstone MWA19907; • Taverner's Bridge, Coventry Canal, Atherstone MWA30985; • Clay Pits Bridge No. 39 over Coventry Canal MWA31569; • Bridge No.38 over Coventry Canal MWA31568; • Mancetter Bridge over Coventry Canal MWA31567; • Stoneleigh Quarry Farm Bridge No. 35 over Coventry Canal MWA31566; • Field access Bridge No.34 over Coventry Canal MWA31565; • Atherstone Road Bridge over Coventry Canal MWA31564; • Hartshill Wharf, Coventry Canal, Hartshill MWA30935; • Nuneaton Road Bridge, Coventry Canal MWA31563; • Anchor Inn, Hartshill Wharf MWA31984; • Hartshill track bridge over Coventry Canal MWA31561;

Asset Name and Reference

- Hill House garden, Caledcote MWA12602;
- Wood Bridge over Coventry Canal MWA31560;
- Site of Bridge 26, Coventry Canal (1200 m SW of Weddington Church), Tuttle Hill, Nuneaton MWA30932;
- Boon's Wharf to north of Tuttle Hill, Nuneaton MWA4382;
- Site of Bridge 25, Coventry Canal, (1000 m SW of Wedington Church), Tuttle Hill, Nuneaton MWA30931;
- Bridge 24, Coventry Canal, (850 m south-west of Weddington Church), Tuttle Hill, Nuneaton MWA30930;
- Canal Cottage 600 m north of Tuttle Hill, Nuneaton MWA4381;
- Old Tramway Bridge over Coventry Canal MWA31558;
- Punch Bowl Bridge over Coventry Canal MWA31557;
- Railway Bridge on the Nuneaton to Birmingham line over Coventry Canal MWA31556;
- Dumble Hole Bridge over Coventry Canal MWA31555;
- Walsh Lane Bridge over Coventry Canal MWA31554;
- Catgallows Bridge over Coventry Canal MWA31553;
- Chilvers Coten Railway Bridge over Coventry Canal MWA31551;
- Coventry Canal (1775) MCT8465 / MCT4614 / MCT13248;
- Coventry Canal (1775) Towpath MCT8464 / MCT4613;
- Towpath MCT13232;
- Hawkesbury Junction, Hawksbury, Warwickshire MWA32005;
- Coventry Canal Hawkesbury Lock Roving Bridge MWA31541;
- The Oxford Canal MWA4348;
- Lock No. 1, Hawksbury Junction, Oxford Canal MWA30675;
- Lock Cottage; Hawksbury Junction MCT462;
- Colliery Mine Shaft, Part of Hawkesbury Colliery, E and W of Oxford Canal MCT503;
- Kings Highway (Telebrigge/Bulkyngton) Le Redeway MCT2353;
- Oxford Canal (1774 to 1775) MCT7936 / MCT3868 / MCT13231 / MCT16187;
- Oxford Canal Towpath (1774 to 1775) MCT7926 / MCT16188 / MCT16191;
- Tusses Bridge; Aldermans Green Road, Hall Green MCT17;
- Homestead MCT16093;
- Bridge MCT16196;
- Stone Bridge, Woodway Lane, Walsgrave on Sowe MCT1109;
- Road/Bridge at Walsgrave on the 1887 MCT16197;
- Noon Hill Bridge, Bridge No. 13, Oxford Canal MWA30679;
- Oxford Canal, Main Road Bridge, Ansty MWA31671;
- Oxford Canal Bridge at Ansty MWA31670;
- Brinklow Lane Canal Bridge MWA19895;
- Oxford Canal Aquaduct over track and stream culvert MWA31669;

Asset Name and Reference

- Hollyhill Footbridge over Oxford Canal MWA31668;
- Site of Canal Aqueduct south-west of Hospford Hall MWA6778;
- Culvert under Oxford Canal MWA31667;
- Mobbs Wood Farm Track Bridge over Oxford Canal MWA31666;
- Grimes Bridge over Oxford Canal MWA31665;
- Johnson's Bridge (No. 27). Stretton-under-Fosse, Rugby MWA30317;
- Aqueduct at Smeaton Lane (Bridge No. 28), Stretton-under-Fosse, Rugby MWA30318;
- Culvert for Smite Brook feeder under Oxford Canal and L&NW Railway MWA31672;
- Stretton Stop, Stretton under Fosse MWA30251
- Stretton Canal Arm, Stretton under Fosse, Rugby MWA30190;
- Fosse Way Bridge over Oxford Canal MWA31664;
- Turnpike road from Market Harborough to Coventry MWA4788;
- Brinklow Arches to east of Brinklow MWA4352;
- Brinklow Road Bridge over Oxford Canal MWA31661;
- Hungerfield Bridge over Oxford Canal MWA31660;
- Oxford Canal Easenhall to Newnham Footbridge MWA31659;
- Former road linking Cathiron Lane and Harborough Magna, Harborough Magna, Rugby MWA30320;
- Disused Canal to west of Cathiron Bridge, Cathiron MWA3461;
- Oxford Canal Cathiron Bridge MWA31644;
- Oxford Canal Cathiron Farm Footbridge MWA31643;
- Oxford Canal Walton's Railway Bridge (LNWR) MWA31642;
- Oxford Canal Tuckey's Bridge MWA31641;
- Wharf adjacent to Tuckey's Bridge, Cathiron, Rugby MWA30319;
- Former course of the Oxford Canal, Lime Farm Marina, Newbold-on-Avon MWA30299;
- Oxford Canal Cathiron Lane Bridge MWA31640;
- Oxford Canal Fall's Bridge MWA31639;
- Newbold Tunnel, Newbold on Avon MWA4353;
- Oxford Canal Newbold footbridge MWA31638;
- Grantham's Bridge, Hillmorton Locks, Hillmorton Locks, Hillmorton, Rugby MWA30386;
- Oxford Canal The Locks Bridge MWA31628;
- Hillmorton Middle Locks, Oxford Canal, Hillmorton, Rugby MWA30368;
- Hillmorton Top Locks, Oxford Canal, Hillmorton, Rugby MWA30369;
- Oxford Canal Moors Lane Bridge MWA31627;
- New Oxford Canal (1834) MNN17435;
- Oxford Canal Railway Bridge MWA31626;
- Oxford Canal London-Birmingham Railway Bridge MWA31625;
- Hillmorton Wharf off Crick Road, Hillmorton MWA4360;
- Canal feeder, 330 m south of Hillmorton Wharf, Hillmorton MWA30727;

Asset Name and Reference

- Tarry's Bridge (Fox Inn) MWA20136;
- Northampton to Dunchurch Turnpike MNN102934;
- Coventry to Peterborough Road Route (via Northampton) MNN14165;
- Old Stratford to Dunchurch Turnpike (MNN10295);
- London & North Western Railway (Daventry to Marton) MNN16991;
- Braunston Wharf (Settlement) MNN143438;
- Site of Braunston Station MNN172634;
- Route of the Grand Junction Canal (late incorporated into The Grand Union Canal) MNN15707;
- Dry Dock (Former Gauging Dock) MNN109949;
- Canal Building, Grand Union Canal MNN171869;
- Lock at Bridge No.2 (Braunston Bottom Lock) MNN109965;
- Braunston Tunnel MNN103599;
- Danesholme Park (Formerly Daneholme Park) MNN3033;
- Banbury to Lutterworth Turnpike MNN135336;
- Possible Railway Remains at Daventry MNN100924;
- Daventry Sewage Works MNN100938;
- Daventry Reservoir MNN103641
- Grand Union Canal (later The Leicester Line) MNN132088;
- Buckby Locks (Flight of Locks) MNN31079;
- New Inn MNN101231;
- Road Weedon, Village & Military Site MNN3012;
- Military Canal Basin & Bridge MNN164267;
- The Wine Warehouse (Parrott House) MNN103384;
- Ironstone Railway MNN135941;
- Nether Heyford Ironworks MNN13448;
- Northampton Arm of Grand Union Canal MNN132204;
- Brickworks (George Savage; W. Asplin) MNN13477;
- Bridge No. 44 MNN105339;
- Railway Bridge Over Canal, London & Birmingham Railway MNN103572;
- Stoneworks Farm (Formerly Blisworth Stoneworks) MNN103568;
- Blisworth Hill Tramway MNN17729;
- Important wall in South Northants MNN163284;
- Important wall in South Northants MNN162999;
- Hardingstone to Stony Stratford MNN135323;
- London to Derby Road MNN14161;
- Cosgrove Canal Lock MNN103625;
- Possible Post Medieval / Modern Building in Cosgrove Village MNN162232;
- Former Buckingham Arm of the Grand Union Canal MNN115112;
- Grand Junction / Union Canal MBC10986;
- Hockcliffe to Stony Stratford Turnpike / Holyhead Road MMK5878;

Asset Name and Reference

- Fornhill to Stony Stratford Turnpike MBC34425;
- Swing Bridge, Grand Union Canal MBD13770;
- Leighton Lock, Grand Union Canal MBD13771;
- Church Lock Cottage, Grove MBC11020;
- Lock No. 29, Grand Union Canal MBC11021;
- Bridge 116, Grove MBC11022;
- Pumping Station, Grove MBC11023;
- Grove Barns MBC33203; and
- Old Church House (Formerly St Michael's Church) Grove MBC5313.

Part 4a: Abstraction, Storage and Treatment Site*Designated Assets*

- 11.5.37 There are no designated heritage assets within the Part 4a EIA Scoping Boundary; however, there is one Scheduled Monument (Roman town of Magiovinium and Roman fort, NHLE 1006943) and two Grade II Listed Buildings within the 1 km study area of Site B.
- 11.5.38 There is one Conservation Area within the 1 km study area of Site B: Great Brickhill Conservation Area (DBC8036).
- 11.5.39 There is one Grade II* Listed Building (Church of the Holy Cross, Grade II*, NHLE 1117831) and seven Grade II Listed Buildings within the 1 km study area of Site H.

Non-designated Assets

- 11.5.40 There are 94 non-designated heritage assets within the study area, including a Neolithic ring ditch identified on aerial photography, Iron Age settlements and enclosures and Roman enclosures. Medieval non-designated heritage assets identified include house platforms, ridge and furrow, earthworks and churchyards. Post-medieval non-designated heritage assets identified include the Grand Junction Canal, Slapton settlement and earthworks. Modern non-designated heritage assets comprise a non-designated building and a marble plaque commemorating local men who were killed in action during WW1 (1914-1918).
- 11.5.41 There are four non-designated heritage assets located within the Part 4a Site B EIA Scoping Boundary. Two are assets are findspots, with the remaining two pertaining to the general background information of Stoke Hammond and Great Brickhill Parishes. There are nine non-designated heritage assets located within the Part 4a (Site H) EIA Scoping Boundary. The majority of these assets are of unknown date. One pertains to the general background information of Slapton Parish (two entries). Two non-designated heritage assets are attributed to the Post-medieval period, comprising a shaft of 20 courses of brick and a spread of post-medieval material overlying a ditch.
- 11.5.42 Of the 94 non-designated heritage assets identified within the study area, 56 have been recorded as findspots.

11.5.43 There is a single Locally Listed Building at Brewery Cottages (DBC10935) located within the study area.

11.5.44 There are three non-designated built heritage assets, comprising post-medieval and modern buildings and structures, within the 500 m study area. However, none of these non-designated built heritage assets are located within the Part 4a EIA Scoping Boundary.

Part 4b: Pipeline to Underground Reservoir near Luton

Designated Assets

11.5.45 There is one Scheduled Monument located partly within the Part 4b EIA Scoping Boundary: Butler's Manor moated site (NHLE 1013961).

11.5.46 The following three Scheduled Monuments are located within 500 m of the Part 4b EIA Scoping Boundary:

- a. Moated site known as 'The Hoult' and associated field system (NHLE 1015584);
- b. Church Farm moated site and associated settlement and cultivation earthworks (NHLE 1012915); and
- c. Site of Roman villa E of church (NHLE 1005409).

11.5.47 There are three Grade I Listed Buildings, six Grade II* Listed Buildings and 67 Grade II Listed Buildings within 500 m of the Part 4b EIA Scoping Boundary. The Grade I and Grade II* Listed Buildings are as follows:

- a. Church of St John the Baptist (Grade I, NHLE 1321308);
- b. Church of St Mary (Grade I, NHLE 1117908);
- c. Church of St Mary (Grade I, NHLE 1159080);
- d. Church of St Mary Magdalen (Grade II*, NHLE 1212666);
- e. Church of St Mary (Grade II*, NHLE 1115994);
- f. Eggington House (Grade II*, NHLE 1114682);
- g. Church of St Michael (Grade II*, NHLE 1158463);
- h. Church of the Holy Cross (Grade II*, NHLE 1117831); and
- i. Doolittle Mill (Grade II*, NHLE 1321286).

11.5.48 There are three Listed Buildings (all Grade II) located within the Part 4b EIA Scoping Boundary which comprise (from north to south):

- a. Remains of Gates, Gatepiers and Walls at Battlesden Lodge (Grade II, NHLE 1321719);
- b. Battledsden Lodge (Grade II, NHLE 1138123); and
- c. The Robertson War Memorial Bequest Obelisk, Robertson Corner (Grade II, NHLE 1438456).

11.5.49 There are six Conservation Areas within 500 m of the Part 4b EIA Scoping Boundary. The following three Conservation Areas are situated within the Part 4b EIA Scoping Boundary:

- a. Great Brickhill (DBC8036);

- b. Little Brickhill (DMK416); and
- c. Kensworth Church End (DBD6497).

11.5.50 One Registered Park and Garden (Battlesden Park, Grade II, NHLE 1000573) is located partly within the Part 4b EIA Scoping Boundary.

Non-designated Assets

11.5.51 There are 1,434 non-designated heritage assets within the study area, including Mesolithic flints and microliths, Neolithic trackways, Bronze Age cemeteries and artefacts, and Iron Age and Roman discreet features, earthworks, artefacts and settlements. Early Medieval non-designated heritage assets identified include woodland, settlements, features, inhumations and artefacts. Medieval non-designated heritage assets identified include ridge and furrow, settlements, buildings, earthworks and artefacts. Post-medieval non-designated heritage assets identified include ridge and furrow, bridges, artefacts, churches, quarries, industrial and residential buildings. Modern non-designated heritage assets identified include infrastructure buildings and roads, bridges, lychgates, railways, WW2, as well as industrial and residential buildings.

11.5.52 There are 160 non-designated heritage assets located within the Part 4b EIA Scoping Boundary. These range from a Palaeolithic round barrow (MBD1392), Neolithic trackways (MBD353 and MBD10843) and Iron Age features (MBC13740 and MBC34197). Roman non-designated heritage assets consist of roads (MBC5588) and features (MBC13743 and 13751). Medieval non-designated heritage assets consists of holloways (MBC1773 and MBC1774), settlements, earthworks, quarry pits and ridge and furrow. Post-medieval non-designated heritage assets consist of agriculture structures (MBD10507), residential buildings (MBD4299), woodland (MBD25519) and parkland (MBC34244). Modern non-designated heritage assets consist of quarries, war memorials (MBD11213) and motor vehicle testing track (MBD24876).

11.5.53 Of the 1,434 non-designated heritage assets identified within the study area, 804 have been recorded as findspots.

11.5.54 There are two Locally Listed Buildings within 500 m of the Part 4b EIA Scoping Boundary at Brewery Cottages and Slapton Mill.

11.5.55 In addition to the two Locally Listed Buildings, there are 101 non-designated built heritage assets, comprising post-medieval and modern buildings and structures, within the 500 m study area.

11.5.56 Of these, there are two non-designated built heritage assets located within the Part 4b EIA Scoping Boundary. **Table 11-6** lists these assets.

Table 11-6: Parts 4b – Non-Designated Built Heritage Assets within the EIA Scoping Boundary

Asset Name and Reference
• Windmill, Church End (MBD13582); and • Northall Bridge, Billington (MBD18799)

Future Baseline

- 11.5.57 There is unlikely to be any change to the baseline conditions described in the previous section. Should there be any changes to the baseline in the future, this is likely to relate to the discovery of previously unknown below ground archaeology remains within the study area.

11.6 Potential for Significant Effects

- 11.6.1 A precautionary approach has been taken and where there is no strong evidence base, insufficient baseline or the significance is uncertain at this stage, the impact has been scoped in to the EIA. Where there is a clear evidence base that the effect from the impact will not be significant, the impact has been scoped out of the EIA.
- 11.6.2 The Proposed Development has the potential to affect heritage assets during construction and operation. Potential impacts to heritage assets comprise direct and indirect effects, as well as alterations to the setting of heritage assets which could affect their heritage value.
- 11.6.3 Direct physical effects comprise construction phase works for the Proposed Development which could potentially result in a change to a heritage asset, such as partial or complete removal.
- 11.6.4 An indirect physical effect can arise from the Proposed Development but is not caused directly by the Proposed Development itself. Vibration from significant groundworks, for example, can affect the fabric of a heritage asset, in particular the historic canal infrastructure which has an inherent fragility and would likely be very susceptible to vibrations. Indirect effects include hydrological changes which have the potential to cause desiccation and drying out of any wetland deposits and associated preserved waterlogged archaeological or geo-archaeological remains. This is particularly relevant in proximity to the proposed Minworth AWTP (Part 1a) where the Proposed Development is located in proximity to recorded deposits of geoarchaeological potential and the River Tame (Ref. 22). Likewise, should an area become inundated, this can also impact the preservation of heritage assets both directly through physical change and indirectly by chemical changes and, where inundation is permanent, through the effective exclusion of that area from future archaeological investigation. The potential for inundation is low but still applicable during both the construction and operation phases. This would be particularly pertinent for the proposed works to the Coventry, Oxford and Grand Union Canals (Part 2) and the Daventry and Drayton Reservoirs (Part 3).
- 11.6.5 Impacts to the value of a heritage asset may occur if the Proposed Development alters the surroundings in which a heritage asset is situated, experienced and appreciated that forms part of its setting. Similarly, historic character may also be affected if the Proposed Development results in a change to the prevailing character of the locality.

Construction Phase

- 11.6.6 The majority of construction effects cannot be scoped out at this stage. However, effects to non-designated heritage assets recorded as findspots by the HER within the EIA Scoping Boundary are proposed to be scoped out. A

findspot is a chance find of archaeological evidence which is no longer within the context it was found in. Findspots can indicate potential for associated archaeological remains, although because they are no longer *in-situ*, they are not considered extant assets and as such are scoped out of assessment at this stage.

- 11.6.7 A summary of the scoping of potential effects from the Proposed Development during the construction phase is provided within **Table 11-7** below.

Table 11-7: Potential effects during the construction phase – Cultural Heritage

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Intrusive construction activities on designated and non-designated heritage assets (including archaeology)	In	All	Physical impacts on heritage assets within the EIA Scoping Boundary as summarised above. The Proposed Development has the potential to result in a permanent physical impact on heritage assets through their truncation, removal, or alteration.
Intrusive construction activities on findspots recorded by the HER	Out	All	Findspots can indicate potential for associated archaeological remains, although because they are no longer <i>in-situ</i> , they are not considered extant assets and as such are scoped out of assessment.
Presence of construction facilities within the landscape impacting upon the setting of designated and non-designated heritage assets (including archaeology)	In	All	The Proposed Development has the potential to result in temporary impacts to heritage assets within both the EIA Scoping Boundary and study areas as a result of temporary changes to their setting during the construction phase.
Machinery, noise, dust, vibration and light impacting upon the setting of designated and non-designated built heritage assets	In	All	Temporary impacts to heritage assets within both the EIA Scoping Boundary and Study Areas as a result of temporary changes to their setting.

Operational Phase

11.6.8 A summary of the scoping of potential effects from the Proposed Development during the operational phase is provided within **Table 11-8** below.

Table 11-8: Potential effects during the operational phase – Cultural Heritage

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Presence of the Proposed Development in the landscape having a long-term and/or permanent setting impact upon designated and non-designated heritage assets (including archaeology), as well as the historic landscape character	In	All	Impacts to heritage assets within both the EIA Scoping Boundary and study area as a result of changes to their setting. The Proposed Development has the potential to result in significant effects on designated, non-designated heritage assets and historic landscapes. Maintenance and activities (including machinery, noise, vibration and dust) required during operation also has the potential to impact upon the setting of heritage assets.
Physical impacts on designated and non-designated heritage assets (including archaeology) caused by the operation of the Proposed Development	Out	All	It is not anticipated that the operational phase (including maintenance) of the Proposed Development will require any intrusive works outside of those areas that have been disturbed during the construction period. Consequently, this phase does not have the potential to physically impact the cultural heritage resource and it is proposed to scope out direct and indirect physical effects to designated and non-designated heritage assets (including buried archaeological remains) within the EIA Scoping Boundary during operation.

11.7 Approach to Assessment

Establishing Baseline Conditions

Study Area

- 11.7.1 The cultural heritage assessment will use a core study area extending 500 m from the EIA Scoping Boundary for all designated and non-designated heritage assets. This is considered sufficient to provide a contextual baseline of known heritage assets and to inform on the likelihood of encountering previously unknown archaeology within the EIA Scoping Boundary. It also considers the likelihood of impacts to the setting of heritage assets, considering the character of the surrounding landscape and the asset types.
- 11.7.2 However, an extended study area of up to 1 km from the Part 1a and Part 4a EIA Scoping Boundary will be used for designated heritage assets due to the greater potential for their setting to extend over a larger area and for which the wider landscape may form a key contributing factor to their value, i.e. Scheduled Monuments, Grade I and II* Listed Buildings and Grade I and II* Registered Parks and Gardens where setting is a key factor in their significance and where this setting extends over a large area.
- 11.7.3 Within the study area (1 km in Part 1a and 500 m in Parts 1b, 2 and 3), consideration of which designated heritage assets may be affected by the Proposed Development will be informed by the Zone of Theoretical Visibility (ZTV) which will be developed in conjunction with the assessments undertaken for **Chapter 16: Landscape and Visual**. This ZTV will define the theoretical visibility of the Proposed Development and present a theoretical study area. This may not reflect what is visible on the ground nor can it be used to define the extent of setting of heritage assets. Assets that do not have intervisibility with the Proposed Development could still be impacted.
- 11.7.4 Designated heritage assets within the extended Study Area will be identified and assessed for their potential to be affected by the Proposed Development. Those assets that are identified to be potentially impacted will then be assessed further in the cultural heritage chapter of the ES. Assessment will consider the significance of the asset, its setting and sensitivity to change. Through such an assessment, assets having a greater influence over the wider landscape may be taken through to assessment, whilst those having a lesser influence may be omitted. This staged approach is consistent with current Historic England guidance (Good Practice Planning Note 3) (Ref. 19).
- 11.7.5 The core and extended study areas are proportionate to identify heritage assets that may be affected by the Proposed Development.

Data Sources

- 11.7.6 The following data sources are proposed to be used to inform the cultural heritage assessment:
- NHLE, held by Historic England for designated assets;
 - HERs of Birmingham, Buckinghamshire, Coventry, Milton Keynes, Warwickshire and West Northamptonshire for non-designated heritage assets;

- c. Conservation Area appraisal and management documents (and mapping) from local planning authorities;
 - d. Historic landscape characterisation (HLC) mapping undertaken by local planning authorities;
 - e. Aerial photographs held by Historic England, local planning authorities and other appropriate repositories and other readily available remote sensing results, such as LiDAR (Light Detection and Ranging) data;
 - f. Geological mapping and borehole information as held by the British Geological Survey;
 - g. Documents, cartography and other resources as deposited within local studies libraries, county libraries and archives, including historic OS maps, tithe, estate and other maps, and other relevant primary sources held at the Birmingham City Archives, Buckinghamshire Archives, Coventry Archives, Milton Keynes City Archives, Warwickshire County Record Office and Northamptonshire Archives Service, together with local studies library information;
 - h. The results, where relevant and available, of heritage assessments and archaeological evaluations undertaken for other projects that cross or fall within the EIA Scoping Boundary and surrounding study area;
 - i. Published regional studies and character assessments;
 - j. Historic OS maps held by the National Library of Scotland;
 - k. Records of British Waterway's Architectural Heritage Survey – a listing survey – conducted by Dr Nigel Crowe late 1980s/early 1990s;
 - l. Relevant items held by the Waterways Archive; and
 - m. Relevant asset-specific engineering and heritage documentation held by the Trust, such as Principal Inspection reports and heritage surveys/assessments.
- 11.7.7 Walkover surveys will also be undertaken, where applicable, to assess known heritage assets and their setting and to determine the potential for previously unrecorded heritage assets. This survey will focus upon the EIA Scoping Boundary, as well as pump station layouts, construction vehicle access routes and compounds.
- 11.7.8 In addition to the DBA, it is proposed that the cultural heritage chapter of the ES is also informed, as appropriate, by the results of:
- a. An aerial photographic and LiDAR assessment;
 - b. Geophysical surveys;
 - c. Geoarchaeological deposit modelling and monitoring; and
 - d. Trial trench evaluation (if required).

Assessment Methodology

- 11.7.9 The following section summarises the methodology proposed to be used for the cultural heritage assessment which builds on the general assessment methodology presented in **Chapter 6: EIA Approach**. The following

paragraphs detail the guidance which has informed the assessment criteria and methodology.

Assessment Criteria

Sensitivity of Receptors

- 11.7.10 The value of a heritage asset (its heritage significance) is guided by its designated status but is derived also from its heritage interest which may be archaeological, architectural, artistic or historic (NPPF Annex 2, Glossary) (Ref. 6).
- 11.7.11 Each identified heritage asset will be assigned a value in accordance with the criteria set out in **Table 11-9**. Using professional judgement and the results of consultation, heritage assets are also assessed on an individual basis and regional variations and individual qualities are considered where applicable.

Table 11-9: Criteria for assessing the value of heritage assets

Value/ Sensitivity	General Criteria
High	World Heritage Sites Scheduled Monuments Grade I and II* Listed Buildings Registered Battlefields Grade I and II* Registered Parks and Gardens Conservation Areas of demonstrable high value Non-designated heritage assets (archaeological sites, historic buildings, monuments, parks, gardens, or landscapes), or Grade II Listed Buildings, that can be shown to have demonstrable national or international importance Well preserved historic landscape character areas, exhibiting considerable coherence, time-depth, or other critical factor(s)
Medium	Grade II Listed Buildings Grade II Registered Parks and Gardens Conservation Areas Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens, or landscapes), or locally listed buildings, that can be shown to have demonstrable regional importance Averagely preserved historic landscape character areas, exhibiting reasonable coherence, time-depth, or other critical factor(s) Historic townscapes with historic integrity in that the assets that constitute their make-up are clearly legible
Low	There is limited potential for significant effects to occur due to changes to access to heritage assets. Locally listed buildings.

Value/ Sensitivity	General Criteria
	Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens, or landscapes) that can be shown to have demonstrable local importance. Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade. Historic landscape character areas whose value is limited by poor preservation and/or poor survival of contextual associations.
Very Low	Assets identified on national or regional databases, but which have no archaeological, architectural, artistic, or historic value. Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade. Landscape with no or little significant historical merit.

Magnitude of Impacts

11.7.12 Having identified the value of the heritage asset, the next stage in the assessment is to identify the level and degree of impact to a heritage asset arising from the Proposed Development. Impacts may arise during construction and operation (including maintenance) and can be temporary or permanent. Impacts can affect the physical fabric of the asset or affect its setting.

11.7.13 The level and degree of impact (impact rating) is assigned with reference to a four-point scale as set out in **Table 11-10**. In respect of the historic environment an assessment of the level and degree of impact is made in consideration of any scheme design mitigation (embedded mitigation). If no impact on value is identified, no impact rating is given, and no resulting effect reported.

Table 11-10: Factors influencing the assessment of magnitude of impacts

Magnitude	General Criteria
High	Changes such that the heritage value of the asset is totally altered or destroyed. Comprehensive change to elements of setting that would result in harm to the asset and our ability to understand and appreciate its heritage significance.
Medium	Change such that the heritage value of the asset is significantly altered or modified. Changes such that the setting of the asset is noticeably different, affecting significance and resulting in changes in our ability to understand and appreciate the heritage value of the asset.

Magnitude	General Criteria
Low	Changes such that the heritage value of the asset is slightly affected. Changes to the setting that have a slight impact on significance resulting in changes in our ability to understand and appreciate the heritage value of the asset.
Very Low	Changes to the asset that hardly affect heritage value. Changes to the setting of an asset that have little effect on significance and no real change in our ability to understand and appreciate the heritage value of the asset.

Effect Significance

11.7.14 Effects can be neutral (as defined below), adverse or beneficial.

11.7.15 An assessment to classify the effect, having taken into consideration any embedded mitigation, is determined using the matrix at **Table 11-11**, which takes account of the value of the asset (**Table 11-9**) and the magnitude of impact (**Table 11-10**).

Table 11-11: Classification of effects

Magnitude	Value and sensitivity of heritage asset			
	Very low	Low	Medium	High
Very low	Negligible	Negligible	Minor	Minor
Low	Negligible	Minor	Minor	Moderate
Medium	Minor	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

11.7.16 In general, 'major' and 'moderate' effects are considered 'significant', whilst 'minor' and 'negligible' effects are considered 'not significant'. Professional judgement will be applied in reaching conclusions as to the significance of effects.

11.7.17 Within the NPPF (Ref. 6), impacts affecting the value of heritage assets are considered in terms of harm and there is a requirement for the decision maker to determine whether the level of harm amounts to 'substantial harm' or 'less than substantial harm'. This is also supported by section 4.8.19 of the NPSWRI (Ref. 6) which directs the Secretary of State to give considerable weight to the conservation of designated heritage assets when determining proposals. The more important the asset, the greater the weight should be. This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

11.7.18 There is no direct correlation between the significance of effect as reported in the ES and the level of harm caused to heritage significance. The test of substantial harm to heritage significance relates to the degree of change to heritage significance which more readily correlates with the magnitude of impact, reported in the ES, rather than significance of effect. A statement of harm will be provided as part of the DCO documentation that assesses the degree of harm resulting from the Proposed Development on designated heritage assets (and non-designated archaeological assets of equivalent

value to scheduled monuments), irrespective of the significance of effect identified.

11.8 Assumptions, Limitations, and Uncertainties

- 11.8.1 This chapter includes a high-level review of available data and presents an overview of the historic environment baseline. Given the scale of the Proposed Development, this chapter is only intended to identify potential pathways to significant effects for the purpose of defining a scope for the historic environment assessment as part of the ES. It does not present all known or previously unrecorded heritage receptors which will be presented in subsequent assessments.
- 11.8.2 As stated previously, the non-designated heritage asset baseline search does not cover the entire 500 m study area due to late changes to the EIA Scoping Boundary. The increase in EIA Scoping Boundary resulted in minimal expansion to the study area, the focus of scoping is of non-designated heritage assets within the EIA Scoping Boundary. As the Proposed Development progresses, non-designated heritage asset data will be collated that takes into account the respective study area of the Proposed Development at the next key stages of EIA.
- 11.8.3 Data supporting this report was obtained from third party sources and may include errors or omissions. All efforts were made to identify and rectify any such issues.
- 11.8.4 A previous DBA report was undertaken for the Severn Trent Minworth Sewage Treatment Works at Minworth (located partially in Part 1a) in December 2023 (Ref. 22) and has been reviewed as part of the scoping inputs. The assessment covers a site boundary that differs from that of this scoping report and the assessment was undertaken without detailed development proposals available at the time of writing. The findings of the assessment, and notably those covering potential geo-archaeological impacts, will be considered and integrated into the forthcoming DBA for the Proposed Development.

11.9 Approach to Mitigation

- 11.9.1 Archaeological evaluation works, including geophysical survey and trial trench evaluation may be required (following consultation with heritage stakeholders) to establish the survival of recorded heritage assets within the EIA Scoping Boundary, and to inform archaeological potential and establish the presence / absence of previously unrecorded heritage assets which may have the potential to be impacted by the Proposed Development.
- 11.9.2 Avoidance, micro-siting and route refinement will be embedded into the design of the Proposed Development where possible. This strategy ensures that, when and where available, baseline data collection will input directly into the iterative design process so that designated heritage assets, non-designated heritage assets, potential sub-surface archaeological remains (particularly suspected features of likely medium or high heritage importance or concentrated areas of known complex archaeological features) and above ground heritage assets are avoided, wherever possible, within the confines of engineering and other environmental constraints.

- 11.9.3 Where the Proposed Development will bring about physical impacts to heritage assets, these effects will be mitigated through measures to include (but not be limited to) detailed landscape/topographic survey, archaeological excavation and recording, historic building recording, and archaeological monitoring/watching brief.

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Chapter 12: Ecology - Aquatic

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12. Ecology – Aquatic

12.1 Introduction

- 12.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on Aquatic Ecology, including sites designated for nature conservation, aquatic habitats, macroinvertebrates, macrophytes, fish, aquatic Invasive Non-Native Species (INNS), and biological water quality.
- 12.1.2 This chapter is informed by a suite of previous work including investigations of the Grand Union Canal (GUC) and Minworth Strategic Resource Option (SRO) schemes at Regulatory Alliance for Progressing Infrastructure Development (RAPID) (Ref. 1) Gate 1, Gate 2, and Gate 3. The investigation reports prepared at Gates 1-2 are listed in **Appendix 12-1: Aquatic Ecology Baseline** within Volume 3 of this EIA Scoping Report. All RAPID documents are available on the Affinity Water website (Ref. 2). Gate 3 reports will be published in due course on the Affinity Water website and, where relevant, the results of Gate 3 investigations are reported within this EIA Scoping Report.
- 12.1.3 This chapter is supported by:
- a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 12-1: GUC Aquatic Ecology Survey Locations;**
 - ii. **Figure 12-2: GUC Fish Habitat Survey Locations;**
 - iii. **Figure 12-3: GUC Water Framework Directive [WFD] Water Bodies;**
 - iv. **Figure 12-4: GUC Invasive Non-Native Species (INNS);**
 - v. **Figure 12-5: Tame and Trent WFD Water Bodies;**
 - vi. **Figure 12-6: Tame and Trent weirs on the rivers Tame and Trent subject to fish passage assessment;**
 - vii. **Figure 12-7: Aquatic Ecology Zone of Influence – Part 1a Tame and Trent; and**
 - viii. **Figure 12-8: Aquatic Ecology Zone of Influence – Parts 1-4.**
 - b. The following appendices in Volume 3 of this EIA Scoping Report:
 - i. **Appendix 7-1: HRA Screening Report;**
 - ii. **Appendix 7-2: WFD Scoping Report; and**
 - iii. **Appendix 12-1: Aquatic Ecology Baseline.**

12.2 Legislation, Planning Policy Context, and Guidance

- 12.2.1 Legislation, planning policy and guidance relating to aquatic ecology is outlined below. This informs the selection of study area, identification of receptors and their sensitivity, and assessment methodology.

Legislation

12.2.2 International treaties of relevance include the Convention of Biological Diversity (Ref. 3) and the Ramsar Convention 1971 (Ref. 4).

12.2.3 The applicable legislation transposed nationally includes:

- a. Wildlife and Countryside Act 1981 (Ref. 5);
- b. The Environment Act 2021 (Ref. 6);
- c. The Countryside and Rights of Way Act 2000 (Ref. 7);
- d. The Natural Environment and Rural Communities (NERC) Act 2006 (Ref. 8);
- e. Animal Welfare Act 2006 (Ref. 9);
- f. Salmon and Freshwater Fisheries Act 1975 (Ref. 10);
- g. The Conservation of Habitats and Species Regulations 2017 (Ref. 11);
- h. The Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref. 12);
- i. Eels (England and Wales) Regulations 2009 (Ref. 13); and
- j. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 14).

National Policies, Plans and Strategies

12.2.4 The relevant national policies, plans and strategies for aquatic ecology are summarised within **Table 12-1** below.

Table 12-1: National policies, plans and strategies – Aquatic Ecology

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 15)	• Section 1.6 Sustainability considerations; • Section 1.7 Habitats considerations; • Section 3 Assessment principles; – Section 3.1 General principles of assessment; – Section 3.2 EIA; – Section 3.3 HRA; and – Section 3.4 Environmental Net Gain. • Section 4.3 Biodiversity and nature conservation.	The National Policy Statement (NPS) sets out the assessment principles for: • EIA – this chapter details the approach to EIA for aquatic ecology receptors; • HRA – The aquatic ecology assessment set out in this chapter will support the HRA, for example for the assessment of fish passage in the rivers Trent and Tame in relation to the Humber Estuary SAC; • Environmental Net Gain, biodiversity and nature conservation, including the approach to mitigation, habitats sites, protected habitats and species, and Biodiversity Net Gain (BNG) – the aquatic ecology assessment will inform the approach to mitigation in relation to aquatic ecology receptors.
National Planning Policy Framework (NPPF) (Ref. 16)	Conserving and enhancing the natural environment, Section 15 paragraphs 187 and 192 – 195 on protecting and enhancing biodiversity.	The NPPF sets out the Government's planning policies for England and how these are expected to be applied, which includes conserving and enhancing the natural environment. The requirements of the NPPF for the assessment of developments with regards to aquatic ecology will need to be satisfied by the assessment methodology presented within this chapter. Furthermore, the NPPF will inform the development of design principles and embedded mitigation proposals for the Proposed Development.
25-year Environment Plan (Ref. 17)	The 25 Year Environment Plan sets out the Government's plan to help the natural world regain and retain good health. It aims to deliver cleaner air and	The 25 Year Environment Plan informs the policy context that will be used for the development of

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	water in cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first. The plan establishes 25-year environmental goals and strategies for environmental management through actions on six key areas of focus. The Environment Act 2021 (Ref. 6) establishes a legal foundation for the Government to implement the 25 Year Environment Plan.	design principles and embedded mitigation proposals for the Proposed Development.
Environmental Improvement Plan 2023 (Ref. 18)	The Environmental Improvement Plan 2023 for England is the first revision of the 25 Year Environment Plan. It builds on the 25 Year Environment Plan's vision with a new plan setting out how the Government will work with landowners, communities and businesses to deliver each of the goals for improving the environment, matched with interim targets to measure progress. The Plan aims to halt the decline in biodiversity, in order to achieve thriving plants and wildlife, and implements the Environment Act 2021, including rolling out Local Nature Recovery Strategies to identify areas to create and restore habitat, and Biodiversity Net Gain to enhance the built environment.	The Plan informs the development of design principles and embedded mitigation proposals for the Proposed Development.

Local Policy

- 12.2.5 The local policies listed in **Table 12-2** are considered relevant to the scope and method of assessment of potential aquatic ecology impacts presented in this chapter.

Table 12-2: List of relevant local policy – Aquatic Ecology

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • Section 6 Environment and Sustainability Policy TP6 Management of flood risk and water resources; and • Section 10 Implementation.	Ref. 19	These policies state the importance of the City's rivers, streams, canals, lakes and ponds for both amenity and wildlife and sets out requirements for developments within these habitats. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	New Local Plan for Birmingham 2042 • Section 57 Policy CE10 Biodiversity and Geodiversity; and • Section 64 Policy CE17 The Canal Network.	Ref. 20	These policies set out requirements to protect biodiversity and waterbodies, and where possible enhance these features through a development. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • LP 1 Sustainable Development; • LP16 Natural Environment; • LP17 Green infrastructure; and • LP33 Water and Flood Risk Management.	Ref. 21	These policies set out requirements to protect biodiversity and waterbodies, and where possible enhance these features through a development. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: • Policy NE1 – Green infrastructure; and	Ref. 22	These policies set out requirements to protect biodiversity, and where possible, provide enhancements through a development. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Policy NE3 Biodiversity and Geodiversity.		
	Borough Plan Review 2021-2039	Ref. 23	No new policies for aquatic ecology identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Coventry City Council	Coventry Local Plan (2011-2031): Chapter 7 Policy GE3 Biodiversity, Geological, Landscape and Archaeological Conservation.	Ref. 24	These policies set out requirements to protect biodiversity and waterbodies (including the canal network), and where possible, enhance these features through a development. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	Local Plan Review: Issues and Options Consultation (2023). Green Infrastructure and Biodiversity Topic Paper. The plan sets goals for: - Goal 3: Clean and plentiful water; and - Goal 9: Enhancing biosecurity.	Ref. 25	These policies set out requirements to protect biodiversity and waterbodies, and where possible, enhance these features through a development. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: - Chapter 9 Policy NE1: Protecting Designated Biodiversity and Geodiversity Assets; and - Chapter 9 Policy NE2: Strategic Green and Blue Infrastructure.	Ref. 26	These policies set out requirements to protect biodiversity and waterbodies, and where possible, enhance these features through a development. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Rugby Borough Local Plan review – issues and options consultation (2023)	Ref. 27	No new policies for aquatic ecology identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: • Policy BN1 – Green Infrastructure Connections; • Policy BN2 – Biodiversity; • Policy BN4 – Upper Nene Valley Gravel Pits SPA; and • Policy BN8 The River Nene Strategic River Corridor.	Ref. 28	Policies BN1 and BN2 set out requirements to protect biodiversity and waterbodies (including the canal network), and where possible, enhance these features through a development. Policies BN4 and BN8 inform the consideration of the River Nene and its tributaries within the assessment. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: • ENV4 – Green infrastructure; and • ENV5 – Biodiversity.	Ref. 29	These policies set out requirements to protect biodiversity and where possible enhance these features through development proposals. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	New Local Plan for West Northamptonshire 2041 • Policy BN9 – Nature Conservation; and • Policy BN10 – Biodiversity Net Gain.	Ref. 30	These policies set out requirements to protect biodiversity and where possible enhance these features through development proposals. Policy BN10 sets the requirement for 10% biodiversity net gain. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
Milton Keynes City Council	Plan: MK 2016 – 2031: • Policy NE1 Protection of sites;	Ref. 31	These policies set out requirements to protect biodiversity and where possible enhance these features through development proposals. As such, they are relevant to defining the scope of

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy NE2 Protected species and; priority species and habitats; - Policy NE3 - Biodiversity and geological enhancement; and - Policy NE4 – Green infrastructure.		the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	New City Plan: Ambition and Objectives Consultation 2023	Ref. 32	No new policies for aquatic ecology identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: - Policy NE1 Biodiversity and Geodiversity; - Policy NE2 River and stream corridors; and - Policy I5 Water Resources and Wastewater Infrastructure.	Ref. 33	These policies set out requirements to protect biodiversity and waterbodies and where possible, enhance these features through development proposals. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives	Ref. 34	No new policies for aquatic ecology identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: - Policy EE1: Green Infrastructure; - Policy EE2 Enhancing Biodiversity;	Ref. 35	These policies set out requirements to protect biodiversity and waterbodies and where possible enhance these features through development proposals. As such, they are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy EE3 Nature Conservation; and • Policy EE11: The River and Waterway Network.		

Guidance and Standards

12.2.6 Relevant guidance and standards which have been used as part of the EIA Scoping process and will also be considered as part of the EIA include:

- a. Planning Practice Guidance (PPG) (Ref. 36); and
- b. Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater (Ref. 37).

12.3 Consultation

12.3.1 A key element of progressing the Minworth and GUC SROs, which form the Proposed Development, through the RAPID gated process has been to investigate the environmental risks and opportunities associated with delivery of the Proposed Development. Previous environmental investigations at Gate 1 to Gate 3 have considered WFD related impacts and benefits, baseline ecological data, and in particular the potential impacts of changes in flow to ecological receptors such as designated sites and their qualifying features, protected and notable species, and constraints from the presence or future spread of INNS. Environmental investigations have been informed by regular engagement with regulators and stakeholders to provide direction for, and agreement with, the on-going assessments.

12.3.2 Consultation with the National Appraisal Unit (comprising the Environment Agency and Natural England) and relevant stakeholders (e.g. the Canal & River Trust (the Trust); the River Trent Working Group (RTWG); the Trust Fisheries and Angling Advisory Group (FAAG)) has been undertaken throughout the RAPID gated process. This has been critical in informing the scope of on-going assessment at each Gate, and subsequently informing EIA Scoping.

12.3.3 Consultation with key regulators and stakeholders is on-going through the Gate 3 assurance process, whereby Gate 3 deliverables are reviewed and amended for agreement prior to Gate 3 submission. This includes defining the scope of assessment for Gate 4 and EIA.

12.3.4 In summary, matters raised by regulators during the review of RAPID deliverables, which have informed the preparation of this EIA Scoping Report, include the below:

- a. The extent, scope and method of aquatic ecology baseline surveys;
- b. Important ecological features to be considered within the assessment; and
- c. Potential impact pathways to be considered within the assessment.

12.3.5 In addition to the engagement undertaken through the RAPID process, a summary of key issues raised during non-statutory consultation for the DCO application with regards to aquatic ecology is provided below:

- a. Concerns regarding impacts on biodiversity along the canal network, including as a result of changes to water quality, flow rates and INNS; and

- b. Concerns regarding impacts from the diversion of water from the River Tame.

12.3.6 These issues will be addressed accordingly in the next stage of the EIA. Furthermore, as part of the EIA process, consultation with the National Appraisal Unit and other relevant stakeholders will be continued throughout the course of the EIA, to inform the assessment and mitigation for the Proposed Development.

12.4 Study Area

12.4.1 This section sets out the study areas adopted for each part of the Proposed Development. The study area for aquatic ecology is shown on **Figure 12-7** and **Figure 12-8** within Volume 3 of this EIA Scoping Report.

Part 1a: Minworth AWTP

- 12.4.2 The Minworth AWTP EIA Scoping Boundary is partly located within the boundary of the Minworth WwRC and partly on adjacent land to the south-east. It is composed of terrestrial habitats, which are considered in **Chapter 13: Ecology – Terrestrial**.
- 12.4.3 The potential impacts on the aquatic ecology of the rivers Tame and Trent as a result of the operation of the Minworth AWTP are described below.
- 12.4.4 The potential impacts on the aquatic ecology of the canals (Part 2 of the Proposed Development) as a result of the transfer of recycled water from Minworth AWTP, including the potential transfer of INNS, are described under Part 2 section below.
- 12.4.5 The INNS assessment will be supported by the sourcing of aquatic ecological data from a 2 km study area around the Minworth AWTP EIA Scoping Boundary to establish the presence of aquatic INNS.

Rivers Tame and Trent

- 12.4.6 The existing Minworth WwRC currently discharges final effluent to the River Tame, with a consented dry weather flow of circa 450 Ml/d (megalitres per day). Between 23 Ml/d (minimum transfer) and 115 Ml/d of recycled water will be diverted into new additional treatment process units within the Minworth AWTP as part of the Proposed Development. The advanced treated recycled water will then be transferred via new pumping stations and pipelines to the Coventry Canal.
- 12.4.7 As a result of the diversion of up to 115 Ml/d of recycled water from the River Tame, there is the potential for reduced flows in the river and corresponding effects to aquatic ecology.
- 12.4.8 The study area for the aquatic ecological assessments of the rivers Tame and Trent (of which the Tame is a major tributary) extends from the two existing discharges from Minworth WwRC to the River Tame (SP 17424 91445 and SP 20033 91373), as far downstream as the Humber Estuary, including to consider potential effects on the Humber Estuary SAC/Ramsar (refer to **Figure 12-8** within Volume 3 of this EIA Scoping Report). This represents a distance of approximately 140 km of the rivers Tame and Trent. This is the study area for the assessment of effects from the operation of the

proposed Minworth AWTP to aquatic ecology, fisheries, water quality, and riparian/marginal habitats of the rivers Tame and Trent.

Part 1b: Minworth to Atherstone Pipeline

- 12.4.9 The Minworth to Atherstone pipeline will transfer recycled water from Minworth AWTP to the Coventry Canal at Atherstone. The interactions of this pipeline on aquatic ecology constitute watercourse crossings of the pipeline route and associated impacts during construction.
- 12.4.10 Main Rivers, notably the River Tame, will be crossed by non-intrusive methods such as Horizontal Directional Drilling (HDD), and therefore effects will be limited. Ordinary watercourses may be crossed by intrusive methods such as open-cut, and therefore these will be considered in the assessment of effects for aquatic ecology.
- 12.4.11 The study area for all watercourse crossings is generally 2 km upstream and downstream; however, where effects may propagate downstream, a wider study area may be considered to assess those downstream effects. This includes the sourcing of baseline data, which may only be available beyond the 2 km extent, so the closest available baseline data would be sought.

Part 2: Outfall and Works to the Coventry, Oxford, and Grand Union Canals

- 12.4.12 The study area for Part 2 in relation to aquatic ecology is the canals themselves, plus any receiving watercourses and water bodies. The canals already overflow to receiving waterbodies at waste weirs and modelling has shown that the volume of these overflows is sensitive to levels at which waste weirs are set in the present day and will be set as a result of the operation of the Proposed Development. The control strategy for the Proposed Development aims to maintain the volume of overflows at waste weirs similar to the pre-development situation.
- 12.4.13 The study area for Part 2 also includes a 2 km buffer around the canal network within the EIA Scoping Boundary, which allows the identification of aquatic ecological receptors in receiving water bodies. This includes both the Indicative Work Area and Indicative Non-Work Areas of the canals, as for the latter there may be effects resulting from changes in canal levels, flow and water quality.

Part 3: Daventry and Drayton Reservoirs

- 12.4.14 The study area for the reservoirs (Part 3) is a 2km buffer drawn from the footprint of the reservoirs themselves and the existing connections of the reservoirs to the GUC.

Part 4a: Abstraction, Storage and Treatment

- 12.4.15 Water will be abstracted from the GUC at a location at the southern end of the transfer route and transferred to a storage and treatment facility.
- 12.4.16 Abstraction from the GUC entails pumping water out of the canal and associated infrastructure and therefore there are potential effects on fish and other aquatic ecological receptors. The study area for Part 4a in relation to aquatic ecology is the GUC itself at the abstraction location, plus a 2 km

buffer around the EIA Scoping Boundary for baseline data, pending the location of the storage and treatment facility.

Part 4b: Pipeline to an Underground Reservoir Near Luton

12.4.17 Similar to Part 1b, the Part 4b pipeline will transfer recycled water from the storage and treatment area to an underground storage reservoir near Luton, for distribution to Affinity Water's supply network. The effects of this pipeline on aquatic ecology result from watercourse crossings of the pipeline route and associated impacts during construction.

12.4.18 Main Rivers will be crossed by non-intrusive methods such as Horizontal Directional Drilling (HDD), and therefore effects to them will be limited. Minor watercourses and tributaries may be crossed by intrusive methods such as open-cut, and therefore these will be assessed in terms of impacts to aquatic ecological receptors.

12.4.19 The study area for such watercourse crossings is generally 2 km upstream and downstream; however, where effects may propagate downstream, the study area may be extended to assess those downstream effects. This includes the sourcing of baseline data, which may only be available beyond the 2 km extent, so the closest available baseline data would be sought as representative for the watercourse.

Summary

12.4.20 **Table 12-3** provides a summary of the study areas by Proposed Development Part.

Table 12-3: Summary of study areas – Aquatic Ecology

Reference point	Study area
Part 1a: Minworth AWTP Rivers Tame and Trent	2 km from the Minworth AWTP EIA Scoping Boundary for sourcing of baseline data. Approximately 140 km downstream on the rivers Tame and Trent as far downstream as the Humber Estuary, including to consider potential effects on the Humber Estuary SAC/Ramsar (refer to Figure 12-8). Study area of 2 km from the rivers Tame and Trent for the sourcing of baseline data.
Part 1b: Minworth to Atherstone Pipeline	Generally, 2 km upstream and downstream of any impacted watercourse; however, where effects may propagate downstream, a wider study area may be considered to assess those downstream effects. This includes the sourcing of baseline data, which may only be available beyond the 2 km extent, so the closest available baseline data would be sought.
Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals	The canals themselves plus a 2 km study area from the EIA Scoping Boundary, which allows the identification of aquatic ecological receptors in receiving water bodies and connecting canal arms.

Reference point	Study area
Part 3: Daventry and Drayton Reservoirs	The reservoirs themselves, the existing connections of the reservoirs to the GUC, plus a 2 km study area from the EIA Scoping Boundary for the sourcing of baseline data.
Part 4a: Abstraction, Storage and Treatment	The GUC itself at the abstraction location, plus a 2 km study area for baseline data from the EIA Scoping Boundary.
Part 4b: Pipeline to an underground reservoir near Luton	Generally, 2 km upstream and downstream of any impacted watercourse; however, where effects may propagate downstream, a wider study area may be considered to assess those downstream effects. This includes the sourcing of baseline data, which may only be available beyond the 2 km extent, so the closest available baseline data would be sought.

12.5 Baseline Conditions

Existing Baseline

- 12.5.1 This section provides an overview of the baseline investigations completed in respect of Aquatic Ecology through the RAPID gated process. Refer to **Appendix 12-1: Aquatic Ecology Baseline** within Volume 3 of this EIA Scoping Report for the list of RAPID documents, where baseline conditions have been established.
- 12.5.2 Baseline investigations undertaken to date have included a combination of desk studies and field surveys. Desk studies have comprised the following:
- Identification of designated sites (statutory and non-statutory) including Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites, Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNR) and Local Nature Reserves (LNRs) and Local Wildlife Sites (LWS) within the study area described in Section 12.4 of this chapter;
 - Data requests from the Local Environmental Records Centres (LERC) covering the extent of the study area for the Proposed Development, including non-statutory designated sites (or equivalent) and protected, notable, and invasive species;
 - Download of ecological data from the Environment Agency Ecology and Fish Data Explorer (Ref. 41), to include aquatic macroinvertebrates, macrophytes, and fish; and
 - Review of the conservation status of habitats and species identified using local lists of priority species and habitats, and those listed in Section 41 of the NERC Act 2006 (Ref. 8).
- 12.5.3 A variety of ecological survey work has been undertaken fully or partially within the EIA Scoping Boundary of the Proposed Development and its surrounds. The survey work undertaken has often covered a much wider area than the immediate surrounds of the Proposed Development, for example considering the large zone of influence (Zoi) of potential impacts propagating along the rivers Tame and Trent. These data sources have been

reviewed and information relevant to the Proposed Development and the respective Zols extracted.

- 12.5.4 A summary of the baseline for aquatic ecological receptors is described below for each part of the Proposed Development. Refer to **Appendix 12-1** in Volume 3 of the EIA Scoping Report for further details and proximity to the receptors listed in **Table 12-4** below. The locations of designated sites are also shown on **Figure 13-1** and **Figure 13-2** within Volume 2 of this EIA Scoping Report.

Table 12-4: Summary of Aquatic Ecology Baseline

Receptor Type	List of aquatic ecology receptors within the study area
Part 1a: Minworth AWTP (including the study area of the Rivers Tame and Trent)	
European Habitats Sites (3 sites)	Ensor's Pool SAC/SSSI, River Mease SAC/ SSSI, Humber Estuary SAC / SPA/ Ramsar/ SSSI
National Statutory Designated Sites (11 sites)	River Blythe SSSI; Middleton Pool SSSI; River Mease SSSI; Lockington Marshes SSSI; Attenborough Gravel Pits SSSI; Holme Pit SSSI; Mother Drain, Misterton SSSI; Humber Estuary SSSI; Kettle Brook LNR; Tameside LNR; Farndon Ponds LNR.
Non-Statutory Designated Sites (20 sites)	River Tame LWS; Ladywalk LWS; Shustoke Reservoirs LWS; Coton Pools LWS; Black Pool LWS; Highbridge Wetland LWS; Trentside Ponds LWS; River Derwent Mouth Lock LWS; Cuttle Brook LWS; Narrow Bridge Fish Pond LWS; Attenborough West Gravel Pits LWS; Attenborough Gravel Pits LWS; Holme Pit LWS; Gunthorpe Lakes LWS; Trent Hills Pool LWS; Fiskerton cum Morton Pond LWS; South Muskham Gravel Pits LWS; Mons Pool Gravel Pits LWS; Cottam Wetlands LWS; Manor Farm Pond Biodiversity Action Site (BAS); Middleton Lakes RSPB Reserve; Dosthill Lake SINC.
Habitats of Principal Importance	There is the potential for habitats within the study area, including those within the designated sites listed above, to qualify as Habitats of Principal Importance (HPI) under Section 41 of the NERC Act 2006 (Ref. 8). These include rivers (including the Rivers Tame and Trent and their tributaries), and ponds.
Records of notable and protected aquatic macroinvertebrates	<i>Baetis buceratus</i> (Scarce Olive, mayfly); <i>Glossiphonia paludosa</i> (Leech); <i>Brachycentrus subnubilis</i> (The Grannom, caddisfly); <i>Ceraclea senilis</i> (Caddisfly); <i>Coenagrion pulchellum</i> (The Variable damselfly); <i>Glossiphonia verrucata</i> (Leech); <i>Planaria torva</i> (Flatworm); <i>Valvata macrostoma</i> (Valve snail)
Records of notable and protected macrophytes	No protected species or other species of nature conservation interest recorded.
Fish records	<i>Salmo salar</i> Atlantic salmon; <i>Barbus barbus</i> Barbel; <i>Alburnus alburnus</i> Bleak; <i>Salmo trutta</i> Brown/Sea Trout; <i>Lampetra planeri</i> Brook lamprey; <i>Lampetra planeri</i> Brook lamprey / ammocoete; <i>Cottus gobio</i> Bullhead; <i>Squalius cephalus</i> Chub; <i>Abramis brama</i> Common Bream; <i>Cyprinus carpio</i> Common carp varieties; <i>Pomatoschistus microps</i> Common Goby; <i>Carassius carassius</i> Crucian Carp; <i>Leuciscus leuciscus</i> Dace; <i>Solea solea</i> Dover Sole; <i>Anguilla anguilla</i> European eel; <i>Anguilla anguilla</i> European eel (glass eels); <i>Platichthys flesus</i> Flounder; <i>Thymallus thymallus</i> Grayling; <i>Gobio gobio</i> Gudgeon; <i>Clupea harengus</i> Herring; <i>Petromyzontidae</i> Lamprey sp.; <i>Phoxinus phoxinus</i> Minnow; <i>Pungitius pungitius</i> Nine-spined stickleback /

Receptor Type	List of aquatic ecology receptors within the study area
	ten-spined stickleback; <i>Perca fluviatilis</i> Perch; <i>Esox lucius</i> Pike; <i>Rutilus rutilus</i> Roach (and Roach hybrids); <i>Oncorhynchus mykiss</i> Rainbow trout; <i>Scardinius erythrophthalmus</i> Rudd (and hybrids); <i>Gymnocephalus cernua</i> Ruffe; <i>Blicca bjoerkna</i> Silver Bream; <i>Cobitis taenia</i> Spined loach; <i>Osmerus eperlanus</i> Smelt; Stone Loach; <i>Acipenser sturio</i> European Sturgeon; <i>Tinca tinca</i> Tench; <i>Gasterosteus aculeatus</i> Three-spined Stickleback; <i>Siluriformes</i> Wels Catfish / Catfish sp.; <i>Sander lucioperca</i> Zander
Records of aquatic, semi-aquatic and riparian INNS	The Aquatic INNS Invertebrates category includes <i>Chelicorophium curvispinum</i> (Caspian mud shrimp); <i>Corbicula fluminea</i> (Asian clam); <i>Crangonyx pseudogracilis/ floridanus</i> (a freshwater shrimp); <i>Dikerogammarus</i> sp.; <i>Dikerogammarus haemobaphes</i> ('Demon' shrimp); <i>Dikerogammarus villosus</i> (Killer shrimp); <i>Dreissena polymorpha</i> (Zebra mussel); <i>Eriocheir sinensis</i> (Chinese mitten crab); <i>Ferrissia californica</i> (wautieri) (River Limpet); <i>Gammarus tigrinus</i> (a freshwater shrimp); <i>Hypania invalida</i> (a Ponto-Caspian polychaete worm); <i>Pacifastacus leniusculus</i> (Signal crayfish); <i>Physella / Physella acuta</i>; and <i>Potamopyrgus antipodarum</i> (New Zealand Mud Snail). The Aquatic INNS Macrophytes / Plants category includes <i>Azolla filiculoides</i> (Water fern); <i>Crassula helmsii</i> (New Zealand pigmyweed); <i>Elodea canadensis</i> (Canadian pondweed); <i>Elodea nuttallii</i> (Nuttall's waterweed); <i>Heracleum mantegazzianum</i> (Giant hogweed); <i>Hydrocotyle ranunculoides</i> (Floating pennywort); <i>Impatiens glandulifera</i> (Himalayan balsam); <i>Lagarosiphon major</i> (Curly waterweed); <i>Lemna minuta</i> (Least duckweed); and <i>Reynoutria japonica</i> (Japanese knotweed). The INNS Fish category consists of <i>Cyprinus carpio</i> (Common carp varieties); <i>Oncorhynchus mykiss</i> (Rainbow trout); <i>Sander lucioperca</i> (Zander); and <i>Silurus glanis</i> (Wels Catfish).
Part 1b: Minworth to Atherstone Pipeline	
European Habitats Sites (0 sites)	N/A
National Statutory Designated Sites (3 sites)	Whitacre Heath SSSI; Kingsbury Wood SSSI / Kingsbury Meadow LNR; and Bentley Park Wood SSSI.
Non-Statutory Designated Sites (42 sites)	River Tame LWS; Coventry Canal pLWS (potential LWS); Lea Marston Lake LWS; Monks Park Wood and Bratts Waste/The Outwoods pLWS; Flanders Hall Woodland LWS; Bentley Common LWS; Birmingham & Fazeley Canal pLWS; Lea Marston Old Quarry LWS; Purley and Mancetter Quarries LWS; Marsh Lane Pools pLWS; Hams Hall Woodlands LWS and pLWS; Kingsbury Water Park & Coton Pools LWS and pLWS; Kingsbury Rifle Range LWS; Upper Coal Spinney pLWS; Coleshill Sewage Works Grassland LWS; Coleshill

Receptor Type	List of aquatic ecology receptors within the study area
	Sludge Lagoons LWS; Black Pool and Abbey Pool pLWS; Baddesley Common LWS; Ladywalk LWS; Wood pLWS; Big Rough and Ash Spinney pLWS; North Lloyds Coppice pLWS; Grendon Wood, Common & Heath LWS; Coopers Grove LWS; The Dumbles pLWS; Forkend Pond pLWS; Legion's Wood pLWS; River Anker pLWS; Gnomon Wood pLWS; Lower Ridings Wood pLWS; Ridge Lane Grassland LWS; Lindridge Stream pLWS; Purley Chase Golf Course pLWS; Fishing Pools pLWS; Baddesley Spinney LWS; Biddleswood and Copes Rough pLWS; Whitacre Pool pLWS; Nightingales Wood pLWS; Whitacre Hall pLWS; Ladywood and Ironstone Wood pLWS; Whitacre Flood Meadow LWS; White Hall Farm LWS.
Habitats of Principal Importance	No aquatic habitats of principal importance were recorded within the study area in the desk study. Whether habitats qualify as HPI will be confirmed through field surveys.
Records of notable and protected aquatic macroinvertebrates	<i>Valvata macrostoma</i> (Large-mouthed valve snail)
Records of notable and protected macrophytes	<i>Apium inundatum</i> (Lesser marshwort); and <i>Nymphoides peltate</i> (Fringed water lily).
Fish records	<i>Cottus gobio</i> (Bullhead), <i>Anguilla anguilla</i> (European eel), <i>Cobitis taenia</i> (Spined loach), <i>Salmo trutta</i> (Brown/Sea trout), <i>Barbus barbus</i> (Barbel), and <i>Thymallus thymallus</i> (Grayling).
Records of aquatic, semi-aquatic and riparian INNS	The Aquatic INNS Invertebrates category includes <i>Dikerogammarus haemobaphes</i> (Demon shrimp), <i>Potamopyrgus antipodarum</i> (New Zealand mud snail), <i>Crangonyx pseudogracilis/floridanus</i> (Amphipod 'shrimp'), <i>Dreissena polymorpha</i> (Zebra mussel), and <i>Corophium curvispinum</i> (Caspian mud shrimp). The Aquatic INNS Macrophytes category includes <i>Elodea nuttallii</i> (Nuttall's waterweed), <i>Impatiens glandulifera</i> (Himalayan balsam), <i>Heracleum mantegazzianum</i> (Giant hogweed), <i>Lemna minuta</i> (Least duckweed), <i>Persicaria hydropiper</i> (Water pepper), <i>Lagarosiphon major</i> (Curly waterweed), <i>Azolla filiculoides</i> (Water fern), <i>Elodea canadensis</i> (Canadian waterweed), <i>Reynoutria japonica</i> (Japanese knotweed), <i>Crassula helmsii</i> (New Zealand Pigmyweed), <i>Myriophyllum aquaticum</i> (Parrot's-feather), and <i>Impatiens capensis</i> (Orange Balsam). The INNS Fish category includes <i>Cyprinus carpio</i> (Common carp).
Part 2: Outfall and Works to the Coventry, Oxford, and Grand Union Canals	

Receptor Type	List of aquatic ecology receptors within the study area
European Habitats Sites (2 sites)	Upper Nene Valley Gravel Pits SPA/ Ramsar site; Ensor's Pool SAC/ SSSI/LNR.
National Statutory Designated Sites (5 sites)	Blue Lagoon LNR; Daventry Country Park LNR; Ensor's Pool SAC, SSSI, LNR; Newbold Quarry Park LNR; and Swift Valley LNR.
Non-Statutory Designated Sites (12 sites)	Coventry Canal potential LWS (pLWS); Coventry Canal LWS; Oxford Canal pLWS; Oxford Canal (North) LWS and pLWS; Daventry Reservoir & Country Park LWS; Drayton Reservoir pLWS; Grand Union Canal LWS – Bugbrooke; Grand Union Canal – Northampton Arm LWS; Grand Union Canal – Navigation Inn LWS; Grand Union Canal, Stanton Low LWS; Ouzel Valley County Wildlife Site (CWS); River Ouzel CWS.
Habitats of Principal Importance	Main habitat types include the canal corridors and wider river corridors. The canals themselves do not represent HPI, however they may be recognised as priority habitats in Local Biodiversity Action Plans (LBAP), which will be established by on-going desk study.
Records of notable and protected aquatic macroinvertebrates and macrophytes	Neither the desk study nor surveys undertaken to date identified any rare or protected native macroinvertebrate fauna or macrophytes in the canals.
Fish records	<i>Alburnus alburnus</i> (Bleak); <i>Salmo trutta</i> (Brown / sea trout); <i>Cottus gobio</i> (Bullhead); <i>Squalius cephalus</i> (Chub); <i>Abramis brama</i> (Common bream); <i>Leuciscus leuciscus</i> (Dace); <i>Anguilla anguilla</i> (European eel); <i>Gobio gobio</i> (Gudgeon); <i>Phoxinus phoxinus</i> (Minnow); <i>Perca fluviatilis</i> (Perch); <i>Esox lucius</i> (Pike); <i>Rutilus rutilus</i> (Roach); <i>Rutilus rutilus</i> x <i>Abramis brama</i> (Roach x common bream hybrid); <i>Scardinius erythrophthalmus</i> (Rudd); <i>Cobitis taenia</i> (Spined loach); <i>Barbatula barbatula</i> (Stone loach); <i>Gasterosteus aculeatus</i> (Three-spined stickleback). * Only a single species record of European eel in the Oxford Canal was identified, indicating that this species is not ordinarily present in the canal and may be present sporadically.
Records of aquatic, semi-aquatic and riparian INNS	<i>Neovison vison</i> (American Mink); <i>Pacifastacus leniusculus</i> (American Signal Crayfish); <i>Elodea canadensis</i> (Canadian pondweed); <i>Lagarosiphon major</i> (Curly Waterweed); <i>Cotoneaster integrifolius</i> (Entire-leaved Cotoneaster); <i>Allium paradoxum</i> (Few-flowered Garlic); <i>Heracleum mantegazzianum</i> (Giant Hogweed); <i>Gunnera tinctoria</i> (Giant-rhubarb); <i>Impatiens glandulifera</i> (Himalayan Balsam); <i>Cotoneaster simonsii</i> (Himalayan Cotoneaster); <i>Cotoneaster bullatus</i> (Hollyberry Cotoneaster); <i>Reynoutria japonica</i> (Japanese Knotweed); <i>Rosa rugosa</i> (Japanese Rose); <i>Crocasmia pottsii</i> x <i>aurea</i> = <i>C. x crocosmiiflora</i> (Montbretia);

Receptor Type	List of aquatic ecology receptors within the study area
	<i>Crassula helmsii</i> (New Zealand Pigmyweed); <i>Elodea nuttallii</i> (Nuttall's Waterweed); <i>Myriophyllum aquaticum</i> (Parrot's-feather); <i>Rhododendron ponticum</i> (Rhododendron); <i>Cotoneaster microphyllus</i> (Small-leaved Cotoneaster); <i>Parthenocissus quinquefolia</i> (Virginia-creeper); <i>Cotoneaster horizontalis</i> (Wall Cotoneaster); <i>Azolla filiculoides</i> (Water Fern).
Part 3: Daventry and Drayton Reservoirs	
European Designated Sites (0 sites)	N/A
National Statutory Designated Sites (1 site)	Daventry Country Park LNR/LWS
Non-Statutory Designated Sites (2 sites)	Daventry Country Park LNR/LWS; and Drayton Reservoir pLWS.
Habitats of Principal Importance	Through surveys completed at Gate 3, it is not considered that either reservoir represents HPI of relevance to aquatic ecology receptors.
Records of notable and protected aquatic macroinvertebrates	Pygmy water boatman <i>Micronecta scholtzi</i> and caddisfly <i>Leptocerus tineiformis</i>
Records of notable and protected macrophytes	<i>Ranunculus hederaceus</i> (Ivy-leaved Crowfoot); <i>Limosella aquatica</i> (Mudwort), starry stonewort <i>Nitellopsis obtuse</i> , fringed water lily <i>Nymphoides peltata</i>
Fish records	<i>Tinca tinca</i> (Tench), <i>Esox lucius</i> (Pike), <i>Perca fluviatilis</i> (Perch), <i>Rutilus rutilus</i> (Roach), <i>Gymnocephalus cernua</i> (Ruffe)
Records of aquatic, semi-aquatic and riparian INNS	<i>Dreissena polymorpha</i> (Zebra mussel); <i>Corbicula fluminea</i> (Asian clam); <i>Sander lucioperca</i> (Zander); <i>Silurus glanis</i> (Wels catfish), <i>Cyprinus carpio</i> (Common carp varieties)
Part 4a: Abstraction, Storage and Treatment¹ and Part 4b: Pipeline to an Underground Reservoir Near Luton	

¹ This includes both Abstraction, Storage and Treatment Site options – Site B and Site H.

Receptor Type	List of aquatic ecology receptors within the study area
European Designated Sites (0 sites)	N/A
National Statutory Designated Sites (2 sites)	Wavendon Heath Ponds SSSI; Blue Lagoon LNR/ LWS
Non-Statutory Designated Sites (37 sites)	River Ouzel CWS; Clipstone Brook CWS; Stockgrove Country Park CWS; Waterhall Park LWS; Canon Hill LWS; Great Brickhill Field LWS; Blue Lagoon LWS; Furze and Partridge Hills LWS; Oak Wood, Stockgrove LWS; Bragenham Fields LWS; King's and Baker's Woods and Heaths CWS; Soulbury Ground Meadow LWS; Rectory Farm CWS; Green Lane Slapton LWS; The Moor & Great Firs, Great Brickhill LWS; Apesfield Spring CWS; Battlesden Lake CWS; Double Arches Pit CWS; Eggington Fields CWS; Fox and Hounds Quarry CWS; Home Wood, Potsgrove CWS; Sewell Disused Railway CWS; Stockgrove Country Park CWS; Stockwood Park CWS; Utcoate Grange Meadow CWS; The Wavendon Heath Ponds roadside nature reserve (RNR); Wavendon Heaths and Aspley Wood CWS; Well Head CWS; River Ouzel, Sparks Meadow to west of Eaton Mill Biological Notification Site (BNS); Whistlebrook BNS; Jubilee Pit BNS; Pond near Buttermilk Wood BNS.
Habitats of Principal Importance	The BAP chalk River Ouzel was identified within the 2 km study area. It runs through Part 2 of the Proposed Development, Part 4b SP5 and SP6 route options and the majority of the Part 4 study area. It is assumed that all tributaries of the watercourse are also chalk stream and habitats of principal importance (HPI). Whether habitats qualify as HPI will be confirmed through field surveys.
Records of notable and protected aquatic macroinvertebrates and macrophytes	Part 4a Site B: <i>Nebrioporus depressus</i> (diving beetle); and <i>Valvata macrostoma</i> (valve snail). Part 4a Site H: <i>Amphinemura standfussi</i> (Stonefly). Part 4b: <i>Amphinemura standfussi</i> (Stonefly), <i>Austropotamobius pallipes</i> (White-clawed Crayfish) (no longer considered to be present), <i>Hydroptila simulans</i> (Caddisfly), and <i>Ouliminius troglodytes</i> (Riffle beetle). No records of aquatic macrophytes were recorded within any of the Part 4 study area from the desk study.
Fish records	Part 4a Site B: <i>Anguilla anguilla</i> (European eel); <i>Barbus barbus</i> (Barbel); <i>Cobitis taenia</i> (Spined loach); <i>Cottus gobio</i> (Bullhead). Part 4a Site H: <i>Cottus gobio</i> (Bullhead); and <i>Salmo trutta</i> (Brown / sea trout). Part 4b: <i>Anguilla anguilla</i> (European eel), <i>Barbus barbus</i> (Barbel), <i>Cobitis taenia</i> (Spined loach), and <i>Cottus gobio</i> (Bullhead).

Receptor Type	List of aquatic ecology receptors within the study area
INNS identified within the canal network or within 2 km of the study area from the last ten years	Part 4a Site B: The Aquatic Macroinvertebrates category includes <i>Crangonyx pseudogracilis/floridanus</i> (Amphipod 'shrimp'), <i>Dikerogammarus haemobaphes</i> (Demon shrimp), <i>Dreissena polymorpha</i> (Zebra mussel), <i>Pacifastacus leniusculus</i> (Signal crayfish), <i>Physella acuta</i> (Acute bladder snail), and <i>Potamopyrgus antipodarum</i> (New Zealand mud snail). The Aquatic Macrophytes category includes <i>Lemna minuta</i> (Least duckweed). Part 4a Site H: The Aquatic macroinvertebrates category includes <i>Crangonyx pseudogracilis/floridanus</i> (Amphipod 'shrimp'), <i>Ferrissia californica</i> (Freshwater limpet), <i>Pacifastacus leniusculus</i> (Signal crayfish), <i>Physella sp.</i> (Bladder snail), <i>Physella acuta</i> (Acute bladder snail), and <i>Potamopyrgus antipodarum</i> (New Zealand mud snail). The Aquatic macrophytes category includes <i>Lemna minuta</i> (Least duckweed). The Terrestrial plant category includes <i>Impatiens capensis</i> (Orange balsam). The Fish category includes <i>Ctenopharyngodon idella</i> (Grass carp) and <i>Cyprinus carpio</i> (Common carp). Part 4b: The Aquatic macroinvertebrates category includes <i>Crangonyx pseudogracilis/floridanus</i> (Amphipod 'shrimp'), <i>Dreissena polymorpha</i> (Zebra mussel), <i>Ferrissia californica</i> (Freshwater limpet), <i>Pacifastacus leniusculus</i> (Signal crayfish), <i>Physella sp.</i> (Bladder snail), <i>Physella acuta</i> (Acute bladder snail), and <i>Potamopyrgus antipodarum</i> (New Zealand mud snail). The Aquatic macrophytes category includes <i>Elodea canadensis</i> (Canadian pondweed), <i>Lemna minuta</i> (Least duckweed), and <i>Persicaria hydropiper</i> (Water pepper). The Terrestrial plants category includes <i>Impatiens capensis</i> (Orange balsam) and <i>Heracleum mantegazzianum</i> (Giant hogweed). The Fish category includes <i>Ctenopharyngodon idella</i> (Grass carp), <i>Cyprinus carpio</i> (Common carp), <i>Sander lucioperca</i> (Zander), and <i>Silurus glanis</i> (Wels Catfish).
Refer to Appendix 12-1 in Volume 3 of the EIA Scoping Report for further details and locations to the receptors listed in this table.	

Future Baseline

- 12.5.5 The future baseline for aquatic ecology is assessed at the assumed opening year of full operation, 2032.

Hydraulic Modelling of the Rivers Tame and Trent

- 12.5.6 Hydraulic and hydrological modelling for the rivers Tame and Trent will consider a range of climate change scenarios. The scenarios will be selected from two Representative Concentration Pathways (RCP) (Ref. 62) to account for different future emissions scenarios and likely temperature change ranges.
- 12.5.7 The modelled future scenarios will inform the ecological assessments of the rivers Tame and Trent, including the fish passage assessment, aquatic ecological assessments, and water quality modelling.
- 12.5.8 Future changes to abstraction and discharges will also be considered, for example for other WwRC, agriculture, industry, and power generation. These will be considered in modelling through being incorporated into the Aquator model for the catchment. Other forecast changes to discharges to the rivers Tame and Trent include Severn Trent's 'Zero Spills' initiative.
- 12.5.9 Water quality modelling will consider future changes to abstractions and discharges, as described above for hydrological modelling.
- 12.5.10 Further information on the hydraulic and hydrological modelling is provided within **Chapter 22: Water Environment and Flood Risk** of this EIA Scoping Report.

Future Changes to Fish Passage in the Rivers Tame and Trent

- 12.5.11 Through consultation with the Environment Agency, it has been agreed that the assessment of aquatic ecology, in particular fish passage in the rivers Tame and Trent, will consider potential changes to fish passage in the river network. Fish passes have already been installed on several weirs and barriers on the Tame and Trent, most recently and notably at Holme Sluices, Colwick.
- 12.5.12 Therefore, it has been agreed with the Environment Agency that the fish passage assessment will consider all fish species, even those that are not currently present at each particular location in the rivers. This is because future improvements to fish passage through fish pass installation or otherwise, may 'open up' the rivers to future colonisation by migratory fish. This includes river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus*, qualifying features of the Humber Estuary SAC, Atlantic salmon *Salmo salar*, brown/sea trout *Salmo trutta*, and European eel *Anguilla anguilla*, as well as potamodromous fish – resident freshwater fish that migrate upstream and downstream within the river, e.g. grayling *Thymallus thymallus*.

12.6 Potential Effects

Construction Phase

12.6.1 The scoping of potential effects from the Proposed Development during the construction phase is presented within **Table 12-5** below. Potential effects are listed for combinations of receptors where they are the same, and likewise for different parts of the Proposed Development. In summary, it is considered that there is potential for the following impacts to occur:

- a. Habitat loss/gain or disturbance/mortality of species as a result of construction, including direct impacts to qualifying features of designated sites (aquatic and marginal/riparian habitats; associated channels and tributaries);
- b. Direct impacts to habitats and species within or connected to designated sites during construction;
- c. Species mortality during construction, for example during open-cut trenching, bank raising, vegetation removal, or other construction activities;
- d. Direct impacts to canals or standing water during construction: Habitat loss or gain;
- e. Pollution (deteriorations in water quality) and hydrological pathways during construction (e.g. reduced discharge from Minworth WwRC; reduced flows in the River Tame; reduction or increase in flow; hydrological regime; altered connectivity to receiving water bodies, e.g. via waste weirs; water level fluctuations);
- f. Changes in hydrological connectivity to canals (e.g. reduced overflows);
- g. Fragmentation of populations of aquatic species or habitats, including migratory species;
- h. Spread of INNS during construction; INNS introduction to the canal network, standing water bodies, or connected water bodies due to construction activity; Spread and/or establishment of INNS during construction through e.g. excavation, plant movement, introduction of INNS from off-site;
- i. Alteration of bank structure/marginal vegetation through bank raising during construction, where required – direct impacts to marginal vegetation due to habitat disturbance and reinstatement;
- j. Potential increased risk of algal bloom and susceptibility of fish to algal blooms;
- k. Changes in sediment composition;
- l. Potential spread of diseases during construction;
- m. Disturbance to fish species, e.g. due to noise and vibration, lighting, including from the construction of watercourse crossings, including HDD and open-trenching;
- n. Detrimental effects to fish passage and spawning habitats;
- o. Entrainment and/or entrapment of European eel during construction;

- p. Potential increased risk of algal bloom due to water quality changes in the reservoirs during construction (e.g. pollution runoff, siltation);
- q. Susceptibility of fish to algal blooms;
- r. Changes in sediment composition; and
- s. Potential spread of diseases during construction.

Table 12-5: Potential effects during the construction phase – Aquatic Ecology

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Designated Sites				
European Habitats sites Ensor's Pool SAC/SSSI	European Habitats Sites potentially within the Zol of the Proposed Development. No impact pathway, therefore, no potential effects.	Out	Part 2	No hydrological impact pathway (and thus potential effect) during construction for any European Habitats sites of interest to aquatic ecology – Ensor's Pool is located as a SAC 1.06 km south-west of the Coventry Canal (Part 2 of the Proposed Development) and there are no potential effects during construction due to the intervening urban environment, which blocks any potential impact pathway.
European Habitats Sites Upper Nene Valley Gravel Pits SPA/Ramsar	Effects to water quality (deterioration) and hydrological pathways (e.g. reduced flows) during construction due to connectivity of Nene catchment to the GUC. Spread of INNS during construction.	In	Part 2 Part 3	Potential impact pathway (and thus potential effect) on downstream Habitat Site caused by construction along the canal network (Part 2 of the Proposed Development) and at the Drayton and Daventry Reservoirs (Part 3 of the Proposed Development), which are upstream in the headwaters of the River Nene Catchment.
European Habitats Sites Humber Estuary SAC/Ramsar/ SSSI River Mease SAC/SSSI	No impact pathway during construction, therefore, no potential effects. These Habitats sites are sufficiently distant to avoid effects to water quality and	Out	Part 1a, including Tame and Trent Part 1b	European Habitats Sites hydrologically connected and within the Zol of the Proposed Development. No impact pathway (and thus potential effect) during construction for any European Habitats sites of interest to aquatic ecology – at c. 120 km (Humber SAC) and c. 23 km (River Mease SAC)

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	hydrology during construction.			from Minworth WwRC, there is no impact pathway (and thus potential effect) during construction (refer to Chapter 22: Water Environment and Flood Risk for detailed assessment). These Habitats sites are sufficiently distant to avoid effects to water quality and hydrology during construction.
National statutory designated sites Whitacre Heath SSSI Kingsbury Meadow LNR Bentley Park Wood SSSI Blue Lagoon LNR Daventry Country Park LNR Ensor's Pool LNR Newbold Quarry LNR Swift Valley LNR Wavendon Heath Ponds SSSI	Direct impacts to qualifying features of designated sites during construction: Deteriorations in water quality. Reduced flows in the River Tame. Changes in hydrological connectivity to canals (e.g. reduced overflows). Direct impacts to habitats and species within or connected to designated sites during construction. Spread of INNS during construction.	In	Part 1b Part 2 Part 3 Part 4b	Potential impact pathways (and thus potential effect) to the following national statutory designated sites: - Whitacre Heath SSSI (Part 1b, adjacent to EIA Scoping Boundary); - Kingsbury Meadow LNR (Part 1b, 1.21 km north-west); - Bentley Park Wood SSSI (Part 1b, 0.02 km south); - Blue Lagoon LNR (Part 2, 1.74 km west); - Daventry Country Park LNR (within Part 3; 703 m south of GUC); - Ensor's Pool LNR (Part 2, LNR: 961 m south-west; of Coventry Canal); - Newbold Quarry LNR (Part 2, 226 m East of Oxford Canal); - Swift Valley LNR (Part 2, 1.20 km east of Oxford Canal); and

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				Wavendon Heath Ponds SSSI (Part 4b, 1.92 km north-east). Direct impacts to qualifying features of designated sites during construction, e.g. habitat loss or disturbance/mortality of designated features; potential impacts to water quality and hydrological pathways during construction.
Other national statutory designated sites (SSSI, LNR) designated at least in part for aquatic ecology interest	There is no impact pathway during construction for any other statutory designated sites of interest to aquatic ecology, due to lack of direct hydrological connectivity.	Out	Part 1a, including Tame and Trent	The closest statutory designated sites of interest to aquatic ecology are the River Blythe SSSI (Part 1a, approx. 2.8 km south-east) and Plantsbrook Reservoirs LNR (Part 1a, approx. 2.4 km west). Refer to Chapter 13 Ecology – Terrestrial for all other statutory designated sites.
Non-statutory designated site: Daventry Reservoir LWS, and Drayton Reservoir pLWS	Direct impacts to qualifying features of designated sites during construction: Deteriorations in water quality. Direct impacts to habitats and species within or connected to designated sites during construction. Spread of INNS during construction.	In	Part 3	Construction works to both reservoirs to facilitate transfer of water from the GUC to the reservoirs, requiring land-take for new pipelines and outfall structures, and potential disturbance and pollution during construction. Potential upgrade to spillway and outflow structures (existing downstream connections to the GUC). Direct impacts to qualifying features of designated sites during construction, e.g. habitat loss or disturbance/mortality of designated features.
Non-statutory designated site: River Tame LWS	Potential impacts of pollution (water quality) and	In	Part 1a, including	The River Tame LWS is approximately 189 m south-east from the Minworth AWTP EIA Scoping

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	hydrological effects (e.g. reduction in flow) during construction. Spread of INNS during construction.		Tame and Trent	Boundary, and hydrologically connected to the WwRC via the final effluent channel and existing WwRC discharges. All other non-statutory designated sites along the Rivers Tame and Trent are scoped out for potential impacts during construction as there is no impact pathway (and thus potential effect).
Non-statutory designated sites – Part 1b: up to 42 sites within the study area (refer to Appendix 12-1) Part 4: 33 CWS or equivalent within the study area (refer to Appendix 12-1)	Potential impacts of pollution (water quality) and hydrological effects during construction. Direct impacts to habitats and species within or connected to designated sites during construction. Spread of INNS during construction.	In	Part 1b Part 4	Up to 42 non-statutory designated sites of interest to aquatic ecology lie within the ZoI for Part 1b, and 33 CWS (or equivalent) for Part 4, and therefore there may be impact pathways (and thus potential effect) as a result of construction activities. Potential impacts through hydrological connectivity during construction, the potential spread of INNS, and disturbance from construction activity (e.g. alteration of bank structure/marginal vegetation through bank raising).
Non-statutory designated sites – Coventry Canal potential LWS (pLWS) Coventry Canal LWS Oxford Canal pLWS Oxford Canal (North) LWS and pLWS	Direct impacts to qualifying features of designated sites: Deteriorations in water quality. Changes in hydrological connectivity to canals (e.g. reduced overspills).	In	Part 2	Potential impacts of pollution (water quality) and hydrological effects during construction. Alteration of bank structure/marginal vegetation through bank raising during construction. Twelve non-statutory designated sites with aquatic ecology interest were identified within the study area, and therefore there may be impact pathways as a result of construction activities.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Daventry Reservoir & Country Park LWS Drayton Reservoir pLWS Grand Union Canal LWS Grand Union Canal – Northampton Arm LWS Grand Union Canal – Navigation Inn LWS Grand Union Canal, Stanton Low LWS Ouzel Valley CWS – floodplain hydrologically connected to GUC. River Ouzel CWS – overlaps the GUC at Leighton Buzzard.	Direct impacts to habitats and species within or connected to designated sites during construction. Spread of INNS during construction.			Further non-statutory designated sites of interest to aquatic ecology and hydrologically connected to the canals may be identified through on-going baseline assessment (refer to Chapter 13 Ecology – Terrestrial for all other statutory designated sites).
Habitats				
Rivers and streams – potential to qualify as Rivers HPI (includes Main Rivers, ordinary watercourses, and ditches), including the River Ouzel chalk stream	Habitat loss or gain as a result of construction. Potential impacts of pollution (water quality) and hydrological effects (reduction or increase in flow; hydrological regime) during construction. Fragmentation of populations of aquatic	In	All	The Rivers Tame and Trent receive recycled water from Minworth WwRC and are hydrologically connected to the Proposed Development. Multiple tributaries are connected to the Tame and Trent. Watercourse crossings (trenchless or open-cut) on the pipeline corridors, as well as potential direct impacts during construction (water quality; hydrological effects).

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	species or habitats, including migratory species. Potential spread of INNS during construction.			Indirect impacts due to the Proposed Development dividing a habitat, group of related habitats, sites or ecological network, or the creation of partial or complete barriers to the movement of species, with a consequent impairment of ecological function (e.g. temporary impacts at watercourse crossings; fragmentation of watercourse riparian habitats during construction leading to disconnection of aquatic populations). The importance of these habitats in supporting aquatic species, their sensitivity to changes in water quality, and as migratory routes for fish, will be established to inform the impact assessment.
Canals (Coventry Canal, Oxford Canal, GUC)	Direct impacts to canals during construction: Habitat loss or gain. Potential impacts of pollution (water quality) and hydrological effects (reduction or increase in flow; altered connectivity to receiving water bodies, e.g. via waste weirs) during construction. Alteration of bank structure/marginal	In	Part 2	Construction works to canals, including bank raising, alteration to bank structure (permanent or temporary), removal of bank vegetation (permanent or temporary), alteration of connectivity to receiving water bodies, e.g. via waste weirs, impacts to water quality due to pollution and siltation during construction. Potential impacts or enhancements to the canals through construction activities. Alteration to the functioning of the canals as ecological corridors during construction; fragmentation of canal riparian habitats during construction leading to disconnection of aquatic populations.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	vegetation through bank raising during construction. INNS introduction to the canal network due to construction activity.			Canals may be recognised as priority habitats in Local Biodiversity Action Plans (LBAP), which will be established by on-going baseline assessment.
Standing water (reservoirs and ponds)	Direct impacts to standing water during construction: Habitat loss or gain (aquatic and marginal/riparian habitats; associated channels and tributaries). Potential impacts of pollution (water quality) and hydrological effects (e.g. level fluctuations) during construction. Alteration of bank structure/marginal vegetation during construction. INNS introduction to standing water bodies due to construction activity.	In	Part 3 (reservoirs) All Parts of the Proposed Development will assessment where relevant (ponds and areas of standing water, e.g. adjacent to the canals, and within the Part 1a EIA Scoping Boundary)	Construction works to reservoirs (Part 3 only), including alteration to bank structure (permanent or temporary), removal of bank vegetation (permanent or temporary). Potential impacts or enhancements to standing water bodies through construction activities. Fragmentation of standing water habitats during construction leading to disconnection of aquatic populations.
Species				

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Aquatic species (macroinvertebrates, macrophytes, fish)	Species mortality during construction, for example during open-cut trenching, bank raising, vegetation removal. Potential impacts of pollution (water quality) and hydrological effects during construction. Reduced discharge from Minworth WwRC. Potential transfer or introduction of INNS during construction.	In	All	Direct impacts on species populations (macroinvertebrates, macrophytes, and fish) associated with mortalities due to construction activities, e.g. site clearance, bank raising, watercourse crossings, impacts to water quality. Diverse aquatic macroinvertebrate and macrophyte assemblage in rivers, canals, and standing water bodies has been identified through surveys. Alteration to hydrological regime in the Rivers Tame and Trent, canals, or other watercourses, and corresponding effects on macroinvertebrates. Alteration to hydrological regime in the Rivers Tame and Trent and corresponding effects on macrophytes.
Fish species assemblage	Species mortality caused by construction activities. Potential impacts of pollution (water quality) and hydrological effects during construction. Susceptibility of fish to algal blooms. Changes in sediment composition.	In	All	All aquatic habitats (watercourses, canals, standing water) support fish species and therefore there is the potential for direct or indirect mortality of fish during construction. Alterations to flow regime and potential water quality impacts during construction. Potential impacts to fish passage (including migratory species) and habitat connectivity.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	Potential spread of diseases during construction.			
Fish	Disturbance, e.g. noise and vibration, lighting, disturbance to fish species, including through HDD crossing of Main Rivers.	In	All	Indirect impacts resulting from a change in normal conditions (i.e. light, noise, vibration, human activity) that result in individuals or populations of species changing behaviour or range. Includes the effects of noise and vibration, and lighting during construction, notably the effects on migratory and spawning fish due to piling, plant movement, machinery, lighting, etc.
Fish – European eel	Entrainment and/or entrapment during construction	In	Part 2	Potential for European eel to become entrained or trapped during construction, which may constitute an offence under the Eels (England and Wales) Regulations 2009.
Fish species – smelt	Detrimental effects to fish passage and spawning habitats	Out	Part 1a, including Tame and Trent	Smelt are scoped out given that Environment Agency records of this species are for the Humber Estuary and not the Rivers Tame and Trent, and no significant hydrological effects are modelled downstream of the tidal limit (Cromwell Weir).
Aquatic macrophytes: Marginal canal vegetation	Raising canal banks – direct impacts to marginal vegetation due to habitat disturbance and reinstatement.	In	Part 2	Bank raising will result in the temporary removal of marginal vegetation during construction, disturbance to marginal habitats, and time taken for reinstatement and development. Like for like habitat replacement is proposed but opportunities

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				for habitat improvement will be considered as part of the EIA and BNG assessment.
White-clawed crayfish	No impact pathway, therefore, no potential effects.	Out	All	Through desk study and eDNA surveys, it has been established that white-clawed crayfish are absent from all parts of the Proposed Development.
Algal bloom in Daventry and Drayton reservoirs.	Potential increased risk of algal bloom due to water quality changes in the reservoirs during construction (e.g. pollution runoff, siltation).	In	Part 3	The Trust report there have been historical algal bloom issues at both Drayton and Daventry Reservoirs. Blue-green algae was reported to be present at Drayton Reservoir by the Canal and River Trust in October 2014 (Ref. 58) and October 2016 (Ref. 59). (Blue-green algal blooms were reported at Daventry Reservoir, most notably in September 2010 and October 2010. A blue green algal bloom occurred in September 2022 in Drayton Reservoir (source: Local Fisheries & Angling Technical Officer). Potential increased risk of algal bloom during construction, e.g. due to water quality impacts.
INNS				
INNS (macroinvertebrates, macrophytes, and fish INNS)	Spread and/or establishment of INNS during construction through (e.g.) excavation, plant movement, introduction of INNS from off-site.	In	All	Construction methods resulting in spread of INNS, e.g. downstream or off-site, during the crossing of watercourses. The potential for increased turbidity may favour survival and spread of zander, and other species which hunt effectively in low-light conditions and are suited to survival in turbid water.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				Changes in water quality during construction facilitates INNS spread or establishment. Risk of INNS spreading during construction from, e.g. excavation, plant movement, introduction of INNS from off-site.

Operational Phase

12.6.2 The scoping of potential effects from the Proposed Development during the operational phase is presented within **Table 12-6** below.

12.6.3 General operational impacts to be considered in the assessment are as follows.

Part 1a: Tame and Trent

12.6.4 Identifying key aquatic ecology receptors, notably migratory fish such as river and sea lamprey which are named in the citation of the Humber Estuary SAC, habitats of critical importance for fish species, and barriers to fish passage and general longitudinal connectivity in the study area, is key to informing the assessment of impacts in the Rivers Tame and Trent through operation of the Proposed Development. Fish passage assessment to date has described in detail the current limitations of weirs and other barriers to fish movement (a critical part of the lifecycle of certain fish species), and recommendations for further work required to fully assess the potential impacts of changes in flow on these ecological receptors;

- a. There is potentially limited fish passability at multiple barriers in the study area; primarily weirs and one set of sluices, noted to be a key current impact, and therefore the likelihood of this being made worse by operation is to be assessed;
- b. The importance of passability at barriers is greatest downstream, as fish will need to pass these prior to passing upstream infrastructure to access essential supporting habitats; i.e. migratory species first need to pass downstream barriers when working their way upstream from the sea;
- c. Changes to water depths, velocities, geomorphology and habitat distribution, quantity and quality, would require further assessment in terms of potential effects on fish species or fish passage;
- d. River and sea lamprey, as features listed in the citation of the Humber Estuary SAC, rely upon spawning habitat in weir pools and elsewhere, and suitable fish passage at weirs and other barriers; existing weir and fish pass designs in the study area may not currently favour lamprey passage. Therefore, potential effects on fish passage at existing barriers and fish passes will be assessed; and
- e. Further HEP schemes are proposed, which may adjust weir heights, localised hydraulics and include the addition or upgrade of fish passes; cumulative effects with other schemes and developments will be assessed.

12.6.5 Ecological flow requirements for species and habitats in the rivers Tame and Trent will inform the assessment of effects. Species become adapted to specific flow regimes and associated habitat conditions, and therefore potential effects on riverine habitats, water quality, and flow regime will be assessed.

12.6.6 Potential reductions in flow as a result of the operation of the Proposed Development may result in a decrease in wetted perimeters; i.e. the extent of

the channel that is inundated with water at any time. The greatest changes are likely in the River Tame:

- a. Reduced flows generally manifest more as reductions in velocity rather than reductions in levels;
- b. Reductions in wetted perimeters would likely result in river habitat changes although these are not necessarily adverse, e.g. features may become exposed that could result in diverse/varied habitats becoming available; and
- c. Potential reductions in flow as a result of the operation of the Proposed Development, would have the greatest effect in the River Tame since the flows from Minworth WwRC comprise a greater proportion of flow in this river than in the Trent.

Part 2: Outfall and Works to the Coventry, Oxford, and Grand Union Canals

12.6.7 Potential effects on the canals through the operation of the Proposed Development include, but are not limited to (refer to **Table 12-6** below for further details):

- a. Predicted increases in water levels in the canals mean that during operation, levels may fluctuate to a greater extent compared to the current normal operating zone of the canals. Therefore, there may be corresponding effects on marginal habitats, aquatic vegetation, etc;
- b. Predicted increases in water levels may necessitate some bank raising works to accommodate the increased levels in the canals, with corresponding effects on marginal habitats, vegetation, and the fauna that they support;
- c. Due to the transfer of up to 115 Ml/d recycled water along the canals, there will be a corresponding increase in flow rates, which could potentially lead to altered sediment deposition and mobilisation, detachment of marginal vegetation, and impacts on juvenile fish with lower swimming speeds and tolerances. The scheme design includes a restriction on the proposed maximum velocity to allow the continued operation of navigation; however, velocities will still be elevated above the current flows in the canals;
- d. Transfer of recycled water along the canals may lead to changes in water quality and temperature, although the Minworth AWTP will treat recycled water to a very high standard. As such, considerations of water quality will include dissolved oxygen, temperature, ammonia, total suspended solids, and other parameters; and
- e. Transfer of recycled water in the canals may lead to benefits in terms of water quality, with reduced turbidity (although the main driver of turbidity is considered to be the boat traffic), which may lead to increased algal growth.

Table 12-6: Potential effects during the operational phase – Aquatic Ecology

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Designated Sites				
European Habitats site: Humber Estuary SAC/Ramsar/SSSI	Potential impacts on fish passage in the Tame and Trent due to reduced flows in the rivers resulting from reduced discharge from Minworth WwRC. Reduced flows and altered hydrological regime in the Tame and Trent results in effects to fish passage (migratory and potamodromous species) at weirs and existing fish passes. Impacts to qualifying features of the SAC: river lamprey and sea lamprey.	In	Part 1a: Tame and Trent only	Reduction in effluent discharge from Minworth WwRC results in reduced flows in the River Tame and subsequent impacts to fish passage at weirs and existing fish passes on the Tame and Trent; impacts to qualifying features of the SAC: river lamprey and sea lamprey, due to disruption of their migration upriver. Assessment of potential changes in river temperature and dissolved oxygen (DO). Predicted negative impacts at Sites (Weirs) 7 and 8, though currently no modelled impacts on river/sea lamprey (qualifying features of the SAC/SSSI) passability: • Site 7 – A4097 Weir (Tame); • Site 8 – Nether Whitacre Weir (Tame); • Holme Sluices – potential changes in the operational window of the fish pass; and changes to temperature and dissolved oxygen in the river Tame and Trent.
European Habitats site: Humber Estuary SAC/Ramsar/SSSI	Impacts on European Sites as a result of reduced flows in the Rivers Tame and Trent, and associated changes to water	In	Part 1a: Tame and Trent only	Reduced effluent discharge from Minworth WwRC results in reduced flows in the Rivers Tame and Trent, and corresponding effects on fish passage and other receptors

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	quality. Potential changes in river temperature and dissolved oxygen (DO). Predicted changes in flow regime, water quality, and connectivity with the River Trent. Potential impacts to salinity due to reduced freshwater flowing into the Humber Estuary and corresponding effects on flora and fauna.			relevant to the European Sites. Further assessment is required to determine the potential effects on the Habitats Sites during operation, due to predicted changes in flow regime, water quality, and connectivity with the River Trent. Potential impacts to salinity flowing into the Humber Estuary and corresponding effects on flora and fauna.
European Habitats site: River Mease SAC/SSSI	Impacts on SAC as a result of reduced flows in the Rivers Tame and Trent, and associated changes to water quality, hydrological regime, and connectivity with the River Mease at its confluence with the Trent.	In	Part 1a: Tame and Trent only	Further assessment is required to determine the potential effects on the Habitats Site during operation.
European Habitats site: Ensor's Pool SAC/SSSI	No impact pathway, therefore, no potential effects. European Habitats Sites within the ZoI of the Proposed Development, but not hydrologically connected.	Out	Part 2	Impacts on Ensor's Pool SAC have been screened out from resulting in a likely significant effect due to lack of hydrological connectivity between the Proposed Development and the SAC and the distance from the Proposed Development to the SAC and intervening urban environment resulting in no hydrological connectivity.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				No impact pathway (and thus potential effect) during operation for any European Habitats sites of interest to aquatic ecology for Part 2.
European Habitats sites (SAC, Ramsar) Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI	Impacts to water quality and hydrological pathways during operation. Drayton and Daventry Reservoirs are upstream in the headwaters of the River Nene catchment. Altered operational regime of the reservoirs may result in water quality impacts and flow changes in the downstream receiving water body in the River Nene catchment.	In	Part 3	Potential impact (and thus potential effect) pathway during operation of Drayton and Daventry Reservoirs, including alterations in hydrological regime, e.g. water quality. Further assessment needed.
National statutory designated sites River Blythe SSSI	Potential impacts to qualifying features of designated sites during operation due to modelled changes in low flows.	In	Part 1a: Tame and Trent only	Scoped in for further assessment due to interaction of reductions in flows in the River Tame with a submerged weir at the downstream end of the River Blythe and potential effects on fish passage.
National statutory designated sites Attenborough Gravel Pits SSSI; Holme Pit SSSI; Mother Drain, Misterton	Potential impacts to qualifying features of designated sites during operation due to minimal changes in low flows.	Out	Part 1a: Tame and Trent only	Potential effects to these water dependent sites as a result of the operation of Part 1a of the Proposed Development due to the minor changes in flow in the River Trent have been shown to be insignificant through hydrological modelling, surface water and groundwater assessment.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
SSSI; Farndon Ponds LNR Plantsbrook Reservoirs LNR				All these sites do not depend upon water supply at times of low flow in the River Trent, and therefore will not be affected by the minimal modelled reductions in flow at these locations.
National statutory designated sites adjacent to or nearby the Tame and Trent: Donington Park SSSI Whitacre Heath SSSI Attenborough Gravel Pits SSSI Holme Pit SSSI Lockington Marshes SSSI Lea Marsh SSSI Humber Estuary SSSI (features other than lamprey spp.)	Changes in connectivity of the SSSI to the rivers Tame or Trent as a result of reduced flows. Potential effects of surface- and groundwater connectivity.	Out	Part 1a: Tame and Trent only	All these SSSIs are sufficiently distant from the Tame and Trent to avoid impacts to surface water supply due to minimal reductions in flows in the rivers as a result of Part 1a the Proposed Development. SSSIs are otherwise dependent on rainfall or flooding (including from other rivers/tributaries) for surface water supply – high flows and flood events in the rivers would remain unaffected by the operation of the Proposed Development. All SSSIs are not dependent on groundwater supply from the rivers Tame or Trent, and therefore there would be no impacts due to the modelled minimal reductions in flows in the rivers. Refer to Chapter 13: Ecology – Terrestrial for consideration of impacts to terrestrial water dependent habitats.
National statutory designated sites: Blue Lagoon LNR (900 m west)	Changes to water quality and hydrological connectivity and regime (flows, levels) during operation	In	Part 1b Part 2 Part 3	Potential impacts to water quality and hydrological pathways during operation. Further assessment needed.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Daventry Country Park LNR (within Part 3; 0 m of GUC) Ensor's Pool LNR (961 m south-west of Coventry Canal) Newbold Quarry LNR (226 m East of Oxford Canal) Swift Valley LNR (1.2 km east of Oxford Canal)			Part 4	
National statutory designated sites: Tameside LNR	Change in connectivity of water bodies in the LNR to the river Tame due to reductions in flow in the Tame.	In	Part 1a: Tame and Trent only	Hydraulic modelling and site connectivity assessment at Gate 3 indicates that a pipe culvert / channel connecting the Tame to 'Smiley Face Pool' in the LNR will become disconnected from the river Tame at low flows. This connection provides fish refuge and connectivity, and further assessment is required to assess impacts of reduced connectivity.
Non-statutory designated sites: Daventry Reservoir LWS, and Drayton Reservoir pLWS	Changes to water quality and operational regime of the reservoirs during operation. Changes to reservoir draw-down zone.	In	Part 3	Utilisation of the reservoirs will change as a result of operation of the Proposed Development. The reservoirs may remain fuller for longer but may be drawn down over a period of days, resulting in a drop in levels. Potential impacts to qualifying features of designated sites during operation, e.g. changes in water quality and hydrological regime, changes in the frequency of draw-

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				down, resulting in impacts to marginal habitats and aquatic species.
River Tame LWS	Potential impacts on water quality and hydrological regime during operation	In	Part 1a, including Tame and Trent	The River Tame LWS is approximately 189 m southeast from the AWTP working area and hydrologically connected to the WwRC via the final effluent channel. Reduced discharge of recycled water from Minworth WwRC may result in reduced flows in the River Tame and corresponding effects on aquatic habitats and species, including designated features of the LWS.
Non-statutory designated sites: LWS or equivalent (pLWS; County Wildlife Site CWS): Part 1b: 42 non-statutory designated sites. Part 2: 12 sites. Part 4: 34 sites.	Potential hydrological changes and impacts to water quality during operation.	In	Part 1b Part 2 Part 4	Potential impacts on water quality and hydrological effects during operation. Further assessment needed.
Non-statutory designated sites (LWS or equivalent): 22 LWS or equivalent	Potential effects of hydrological changes during operation resulting in altered connectivity with the River Tame. (Connectivity to the River Trent is modelled to remain unchanged).	Out	Part 1a: Tame and Trent only	22 LWS or equivalent sites designated in part for aquatic ecology are located within 2 km of the rivers Tame and Trent. All are scoped out on the basis that modelled hydrological changes will be insignificant and will not have an effect on aquatic habitats. Refer to Chapter 13: Ecology –

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				Terrestrial for consideration of the potential effects on water dependent terrestrial habitats.
Non-statutory sites unconnected to the canal network (LWS, and CWS)	No change expected.	Out	Part 2	Modelling and design assumptions indicate that there will be no impacts to aquatic receptors in sites unconnected to the canals, and no changes in flows over waste weirs to receiving water bodies. Refer to Chapter 13: Ecology – Terrestrial for the consideration of impacts to water dependent terrestrial habitats.
Habitats				
Rivers and streams – potential to qualify as Rivers HPI (includes Main Rivers, ordinary watercourses, and ditches), including the River Ouzel chalk stream	Potential changes in water quality and hydrological effects during operation. Fragmentation of habitats or populations due to changes in hydrological regime. Reduced discharge of recycled water from Minworth WwRC, and corresponding changes in water quality in the River Tame/Trent – changes in dilution regime; changes in temperature and dissolved oxygen. Potential spread of INNS during operation.	In	All	The Rivers Tame and Trent receive recycled water from Minworth WwRC and are hydrologically connected to the site. Multiple tributaries are connected to the Tame and Trent. Indirect impacts due to the Proposed Development dividing a habitat, group of related habitats, sites or ecological network, or the creation of partial or complete barriers to the movement of species, with a consequent impairment of ecological function (e.g. changes in hydrological regime affecting the ability of species to disperse and subsequent disconnection of aquatic populations).

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				The importance of these habitats in supporting aquatic species, their sensitivity to changes in water quality, and as migratory routes for fish, will be established to inform the impact assessment.
Canals (Coventry Canal, Oxford Canal, GUC)	Changes in flow rates, hydrological regime, and water quality due to operation of the Proposed Development. Alteration of bank structure/marginal vegetation through operation. INNS introduction to the canal network during operation.	In	Part 2	Alteration to the functioning of the canals as ecological corridors during operation; fragmentation of aquatic populations due to increased flow rate and changes in hydrological regime. Changes in water quality (e.g. temperature and dissolved oxygen) may affect the ecological functioning of the canals. Increased flows may result in changes to marginal habitats and vegetation, and sedimentation regime, and may facilitate the spread of INNS along the canals.
Standing water (reservoirs and ponds)	Changes to water quality and operational regime of the reservoirs during operation. Changes to reservoir draw-down zone. Potential changes in water quality and hydrological regime during operation. INNS introduction to standing water bodies due to water	In	Part 3 All (ponds and areas of standing water, e.g. adjacent to the canals, ponds within the Minworth AWTP EIA Scoping	Utilisation of the reservoirs will change as a result of operation of the Proposed Development. The reservoirs may remain fuller for longer but may be drawn down over a period of days, resulting in a drop in levels. Potential impacts to standing water habitats during operation, e.g. changes in water quality and hydrological regime, changes in the frequency of draw-down, resulting in impacts to marginal habitats

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	transfers during operation.		Boundary	and aquatic species. Potential changes in hydrological connectivity between the rivers/canals and nearby areas of standing water and impacts from changes in water quality and altered flow regime.
Species				
Aquatic species (macroinvertebrates, macrophytes, fish)	Changes in water quality and hydrological regime.	In	All	Changes in water quality and hydrological regime in all water bodies may result in changes to aquatic communities and interactions.
Fish (passage of migratory and resident species)	Potential barriers to fish passage on the river Tame and Trent.	In	Part 1a: Tame and Trent only	Potential barriers to fish passage on the river Tame and Trent (25 barriers of which 10 located on the River Tame and 15 on the River Trent – refer to Appendix 12-1 for details).
		Out	(Site 11 only)	Site 7 (A4097 weir) has been scoped in given that the Proposed Development is predicted to have a negative impact for salmon and trout passability. Site 8 (Nether Whitacre Weir) has been scoped in because the Proposed Development is predicted to have a negative impact on fish passability, due to the reduction in depths and increase in hydraulic head associated with the reduction on flows but no impact on river/sea lamprey passability.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				Site 11 (Meadow Weir) was scoped out due to the Proposed Development not expected to have an impact on the overall passability and the site already being considered a 'complete barrier' for all flows and species for the baseline situation, limited by depths (passage through the fish pass unimpacted). All the remaining barriers have been scoped out given that there is no modelled impact on passability for any fish species. Holme Sluices – potential changes in the operational window of the fish pass; and changes to temperature and dissolved oxygen in the river Tame.
Fish (impacts to fish passage for migratory and resident species)	Reduced fish passage due to reduced flow in the River Tame	Out	Part 1a: Tame and Trent only	Potential barriers to fish passage in the river Tame, screened out of further assessment at Gate 2 (refer to Appendix 12-1 for further details): Site 1: Orton Weir – The Environment Agency advised that achieving improved fish passability at this site at low flows (Q70 or lower) is not critical. In addition, it is located just upstream of the main Minworth discharge. As such it is scoped out. Site 2. Water Orton Lane road bridge – site visit determined that this was not a barrier

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				to fish passage, given it is a bridge with flowing river beneath it. It is located just upstream of the main Minworth discharge. As such it is scoped out.
Fish species assemblage	Reduced dilution in the Rivers Tame and Trent affecting fish olfaction.	In	Part 1a: Tame and Trent only	Changing concentrations of chemicals in the River Tame as a result of operation of Part 1a of the Proposed Development – diversion of effluent away from the River Tame and resulting changes in dilution or chemical inputs. On-going water quality monitoring to inform further update of water quality model. Further monitoring of cypermethrin in the River Tame utilising a lower limit of detection. When the results of on-going monitoring are available, the mass balance calculations for cypermethrin will be updated accordingly. Update of water quality modelling to inform assessment of impacts to aquatic ecology, notably on fish olfaction.
Fish assemblage in the canals including juvenile fish	Increased flow rate in canals. Changes in water quality. Alterations in habitat availability and shelter for juvenile fish (e.g. vegetation).	In	Part 2	Flow impacts – increased flow in the canals due to the transfer results in greater flow velocities, shown at Gate 2 to be potentially too high for juvenile fish. Corresponding impacts to marginal habitats and vegetation. Updated hydraulic modelling at the location

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				of the Atherstone discharge, to inform assessment of impacts to fish assemblage, including juvenile fish. Impacts to water quality, causing high turbidity and associated effects, changes to temperature and dissolved oxygen at the Atherstone outfall, for example from poaching and tilled land adjacent to the canal. To be informed by further sediment mobilisation and contaminant assessment. On-going water quality modelling to inform the impact assessment of dissolved oxygen, temperature, and other parameters.
Fish – European Eel	Entrainment and entrapment of eel at pumps, bypasses, and abstractions during operation. Potential for European eel to become entrained or trapped during operation, which may constitute an offence under the Eel Regulations.	In	Parts 2 and 3	Installation of pumps, bypasses, outfalls, and abstractions presenting barriers to eel and the risk of eel entrainment and/or mortality. The canals do not represent a typical migratory pathway for eel. Eels enter the canal from connected water bodies and are subsequently disconnected from migratory pathways. Further consultation with the Environment Agency to be undertaken regarding the application of Eel Regulations and eel passage guidance to canal infrastructure, considering the point above.

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Fish species: smelt	Potential impact on fish assemblage	Out	Part 1a: Tame and Trent only	Smelt were scoped out at Gate 1 given that Environment Agency records of this species are for the Humber Estuary and not the Rivers Tame and Trent.
Aquatic macroinvertebrates	Changes in water quality and hydrological regime	In	Parts 1a, including Tame and Trent, 2 and 3	Diverse aquatic macroinvertebrate assemblage in rivers, canals, and standing water bodies has been identified through surveys. Changes in water quality and alteration to hydrological regime in the Rivers Tame and Trent, canals, or other watercourses, and corresponding effects on macroinvertebrates.
Aquatic macrophytes	Changes in water quality and hydrological regime. Increased flows in the canals leading to increased risk of detachment and possible blocking of intakes and navigation. Lowered turbidity in upper reaches leading to improved growth.	In	Part 1a, including Tame and Trent, 2 and 3	Diverse aquatic macrophyte assemblage in rivers, canals, and standing water bodies has been identified through surveys. Changes in water quality and alteration to hydrological regime in the Rivers Tame and Trent, canals, or other watercourses, and corresponding effects on macrophytes. Assessment of the likelihood of macrophyte detachment due to increased flows in the canals. On-going water quality modelling to inform further assessment of effects on aquatic macrophytes. Monitoring of INNS spread in the canals and reservoirs informed by on-

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				going ecological surveys.
White-clawed crayfish	No impact pathway, therefore, no potential effects.	Out	All	Through desk study and eDNA surveys, it has been established that white-clawed crayfish are absent from all parts of the Proposed Development.
Algal blooms in Daventry and Drayton reservoirs.	Potential increased risk of algal blooms during operation	In	Part 3	The Trust report indicates that there have been historical algal bloom issues at both Drayton and Daventry Reservoirs. Blue-green algae was reported to be present at Drayton Reservoir in October 2014 and October 2016. Blue-green algal blooms were reported at Daventry Reservoir, most notably in September 2010 and July 2011. Potential risk of algal blooms during operation, e.g. due to water quality impacts. On-going water quality monitoring and modelling to inform the assessment of the risk of algal blooms.
INNS				
INNS (macroinvertebrates, macrophytes, and fish INNS)	Spread and/or establishment of INNS during operation.	In	Part 1a, including Tame and Trent, 2 and 3	Increased risk of INNS transfer during operation due to water transfer from Minworth AWTP to the canals and onward. Pathway risk assessment of INNS transfer, both within the Proposed Development working areas and beyond, for example

Receptor	Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
				along the Rivers Tame and Trent, and to water bodies hydrologically connected to the canal network.
INNS (macroinvertebrates, macrophytes, and fish INNS)	Reduction in river levels within the River Tame may allow INNS species to further colonise. Increased flow in canals. Spread of INNS from GUC to reservoirs.	In	Part 1a: Tame and Trent only	Given the prevalence of INNS in the river Tame under existing conditions, this was assessed as low risk at Gate 2. However, the potential impacts of the increased spread of INNS in the rivers Tame and Trent requires further assessment through the EIA. Potential for habitat destabilisation (with the potential to facilitate relevant INNS, i.e. those not already widespread), following reduction in flow in the River Tame.

12.7 Approach to Assessment

Establishing Baseline Conditions

- 12.7.1 Establishment of the baseline environment to date (within the study areas, survey areas and resulting ZOI) has involved reference to existing data sources where available and from field surveys. This builds on the comprehensive baseline datasets that have been built through the previously stated investigations through the RAPID gated process, as described in Section 12.5 above.
- 12.7.2 The desk study will be updated as part of the EIA process, reviewing sites designated for nature conservation and records of protected and/or notable habitats and species (ecological features) and INNS that are relevant to the Proposed Development within the study area. The desk study will also identify the status of water bodies covered by the WFD (Ref. 14) in order to identify those likely to be impacted from an ecological perspective.
- 12.7.3 Online data resources that will be reviewed to update the desk study include:
- a. The Natural England designated sites website (Ref. 38) for information on statutory designated sites of nature conservation interest and to confirm reasons for designation and their current condition;
 - b. The MAGIC Map website (Ref. 39) to identify the location (and details) of statutorily designated sites, Priority habitats and for any granted European Protected Species Licence applications within the zone of influence;
 - c. The Joint Nature Conservation Committee (JNCC) (Ref. 40) for site information and designation details of SACs, SPAs and Ramsar Sites identified within the relevant study areas;
 - d. Environment Agency Ecology and Fish Data Explorer (Ref. 41) for species records of fish, macroinvertebrate and macrophytes species within the study area;
 - e. National Biodiversity Network (NBN) Atlas (Ref. 42) for records of notable aquatic species and INNS, where data licensing conditions allow;
 - f. Environment Agency Catchment Data Explorer for data on WFD water bodies within the study area (Ref. 43); and
 - g. Data requests to the Local Environmental Records Centres for those areas covered by the potential impacts of the Proposed Development, as per the Terrestrial Ecology assessment (**Chapter 13: Ecology – Terrestrial**).
- 12.7.4 Baseline surveys are on-going and have not yet proceeded for some parts of the Proposed Development, notably Part 1b and Part 4. The aquatic ecology surveys shown in **Table 12-7** below are on-going or proposed for the parts of the Proposed Development indicated. Update surveys may also be required for other parts of the Proposed Development according to the timescale for the validity of survey data as per CIEEM Guidance (Ref. 44) for the DCO submission.

Table 12-7: On-going and proposed aquatic ecology baseline surveys

Survey	Timing (inclusive months)	Part(s) of Proposed Development
Aquatic walkover (scoping) survey	Any time	Part 1b; Part 4a; Part 4b All water bodies within the boundary of the Proposed Development
Aquatic Macroinvertebrates	Spring (March to May) and/or autumn (September to November)	Part 1b; Part 3; Part 4a; Part 4b Intrusive watercourse and ditch crossings where desk study data is lacking; channels connecting reservoirs to the canal
Aquatic Macrophytes	Summer (June to September)	Part 1b; Part 3; Part 4a; Part 4b Intrusive watercourse and ditch crossings where desk study data is lacking; channels connecting reservoirs to the canal
Fish	Summer (June to September)	Part 1b; Part 2; Part 4a; Part 4b Intrusive watercourse and ditch crossings where desk study data is lacking; eel surveys of the canals
River Habitat Survey (RHS)	Summer (May to September) – although can be completed at any time	Part 1b; Part 4a; Part 4b Intrusive watercourse and ditch crossings where desk study data is lacking
Canal PSYM	Spring (March to May)	Part 4a; Part 2 Sections of the canals not yet surveyed; Ashby Canal
INNS (included within each survey above)	As above	Part 1a; Part 1b; Part 2; Part 3; Part 4a; Part 4b All water bodies within the boundary of the Proposed Development
River MoRPh survey and ditch condition assessment for BNG	Any time (in appropriate survey conditions, i.e. low flow)	All water bodies within the boundary of the Proposed Development

Assessment Methodology

12.7.5 The impact assessment will be undertaken in accordance with CIEEM guidelines (Ref. 37) as summarised below. The aims of the ecological impact assessment are to:

- a. Identify relevant ecological features (e.g. designated sites, habitats, species or ecosystems) which may be impacted;

- b. Provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant likely significant effects of the Proposed Development. Impacts and effects may be positive (beneficial) or negative (adverse);
- c. Facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- d. Set out what steps will be taken to adhere to legal requirements relating to the relevant ecological features concerned.

12.7.6 The principal steps involved in the CIEEM approach can be summarised as:

- a. Ecological features that are both present and might be affected by the Proposed Development are identified (both those likely to be present at the time works begin and those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;
- b. The importance of the identified ecological features is evaluated, placing their relative biodiversity and nature conservation value into geographic context, which is then used to define the relevant ecological features that need to be considered further;
- c. The changes or perturbations predicted to result as a consequence of the Proposed Development (i.e. the potential impacts) and which could potentially affect relevant ecological features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;
- d. The Likely Significant Effects (LSEs) (positive or negative) on relevant ecological features are then assessed, and where possible quantified;
- e. Measures to avoid or reduce any LSEs, if practicable, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines) and if necessary, measures to compensate for LSEs on features of nature conservation importance are also included;
- f. The residual effects of the Proposed Development are reported; and
- g. Scope for ecological enhancement is considered.

12.7.7 The CIEEM guidelines (Ref. 37) make clear that there is no need to “...carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable”. Therefore, it is not necessary for the assessment to address all habitats and species with potential to occur in the relevant study area and instead the focus is on those that are ‘relevant’, i.e. ecological features that are considered to be important and potentially affected by the Proposed Development. This does not mean that efforts will not be made to safeguard wider biodiversity, for example informed by the BNG assessment.

Assessment Criteria

- 12.7.8 To support a focussed assessment, there is a need to determine the scale at which the relevant ecological features identified through the desk studies and field surveys undertaken for the Proposed Development are of value. The value of each relevant ecological feature will be defined with reference to the geographical level at which it is notable.
- 12.7.9 The frames of reference used for this assessment, based on section 4.7 of the CIEEM guidelines (Ref. 37), are:
- International (Very High) importance/value (i.e. Ramsar Sites, SACs and SPAs) (typically within the geographic area of Europe);
 - UK or national (High) importance/value (i.e. Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in England, with context relative to Great Britain as a whole);
 - Regional (High) importance/value (i.e. within the Region in which the relevant Part of the Proposed Development is located, e.g. the catchment of the rivers Tame and Trent for Part 1a);
 - County (Medium) importance/value (e.g. Warwickshire, Leicestershire, Bedfordshire, etc.);
 - District (Medium) importance/value (i.e. town or parish area, e.g. Royal Town of Sutton Coldfield (in which Minworth is located), Daventry, Leighton Buzzard);
 - Local (Low) importance/value (i.e. ecological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and
 - Site (Very Low) importance/value (i.e. common and widespread ecological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

Sensitivity of Receptors

- 12.7.10 Species populations are valued on the basis of their size, recognised status (such as recognised through published lists of species of conservation concern and designation of Biodiversity Action Plan (BAP) status) and legal protection. For example, populations of river lamprey and sea lamprey exceeding the conservation targets of an SAC for which they are listed as qualifying features, may be of international importance; and those failing to meet conservation objectives or of limited distribution in the catchment may be assessed as of lesser importance.
- 12.7.11 In assigning values to species populations, it is important to consider the status of the species in terms of any legal protection. However, it is also important to consider other factors such as its distribution, rarity, population trends and the size of the population which would be affected. For example, whilst European eel is afforded protection at a national level under the relevant legislation and therefore conservation of the species is of significance at the national or international level, this does not mean that every population of European eel is nationally or internationally important. It

is important to consider the particular population in its context. Therefore, in assigning values to species, the geographic scale at which they are important will be considered. The assessments of value rely on the professional opinion and judgment of suitably experienced ecologists.

12.7.12 Plant communities are assessed both in terms of their intrinsic value and as habitat for protected species whose habitat is also specifically protected and for species of nature conservation concern which are particularly associated with them.

12.7.13 Due regard will also be paid to the legal protection afforded to species during the development of mitigation and compensation measures to be implemented for the Proposed Development. For European Protected Species, there is a requirement that the Proposed Development should not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

12.7.14 Assessing the value of features requires consideration of both existing and future predicted baseline conditions. Therefore, the description and valuation of ecological features takes account of any likely changes, such as trends in the population size or distribution of species, likely changes to the extent of habitats and the effects of other proposed developments or land use changes; as explained in the '*Future Baseline*' section within this chapter.

12.7.15 All ecological features of Local value and above, where there is the potential for the Proposed Development to impact them directly or indirectly, will be taken forward to impact assessment and are the 'relevant ecological features' for the purposes of the EclA.

12.7.16 A summary of the value (importance) of ecological features and the geographical frames of reference to be used for the assessment, based on Section 4.7 in the CIEEM guidelines (Ref. 37) is presented in **Table 12-8**.

Table 12-8: Summary of sensitivity of ecological features, according to geographic context

Value (Importance) of ecological receptor	Geographic Frame of Reference	Examples
Very High	International	Statutorily designated sites, such as Ramsar Sites, SACs (including candidate SACs), SPAs, normally within the geographic area of Europe. Species occurring in numbers approaching that of international importance (i.e. >1% of a biogeographic population). Qualifying species connected to an SAC.
High	UK or National (Great Britain), but considering the potential for certain ecological features to be more notable (of higher value) in England, with context relative to Great Britain as a whole)	Statutorily designated site, such as a SSSI or NNR. Species occurring in numbers approaching that of national importance (i.e. >1% of the UK population). Priority habitats included on Annex I of the Habitats Directive or S41 of the NERC Act 2006 (Ref. 8).
High	Regional (i.e. within the Region in which the relevant Part of the Proposed Development is located, e.g. the catchment of the rivers Tame and Trent for Part 1a)	Species occurring in numbers of greater geographical importance than within the county but does not reach the threshold to be of National importance.
Medium	County (e.g. Warwickshire, Leicestershire, Bedfordshire, etc)	Non-statutorily designated sites, such as CWS and LWSs. Species occurring in numbers approaching that of county importance (i.e. >1% of the county (if known) population).
Medium	District (i.e. town or parish area, e.g. Royal Town of Sutton Coldfield (in which Minworth is located), Daventry, Leighton Buzzard)	Species occurring in numbers approaching that of district importance (i.e. >1% of the district (if known) population).

Value (Importance) of ecological receptor	Geographic Frame of Reference	Examples
Low	Local	Species of conservation interest, e.g.: UK Biodiversity Action Plan (UKBAP) / Local Biodiversity Action Plan (LBAP) species that contribute to the local community. Areas of habitat that do not meet criteria for selection as a non-statutory designated site. Areas of habitat or species that are considered to enrich local area.
Very Low	Site	Species that are common and widespread and are not legally protected or included within local planning policy. Areas of habitat that are widespread and of no local value (such as a fence-line or hard-standing).

Magnitude of Impacts

12.7.17 In line with Section 1.21 of the CIEEM guidelines (Ref. 37), the terminology to be used within the EclA draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of the EclA these terms are defined as follows:

- a. Impact – actions resulting in changes to an ecological feature. For example, construction activities of a development removing a hedgerow; and
- b. Effect – outcome resulting from impact acting upon the conservation status or structure and function of an ecological feature. For example, the effects on a population of migratory fish as a result of detrimental impacts to fish passage.

12.7.18 When describing potential impacts (and where relevant the resultant effects) consideration is given to the following characteristics likely to influence this:

- a. Positive or negative – i.e. is the change likely to be in accordance with nature conservation objectives and policy and is that change:
 - i. Positive – a change that improves the quality of the environment, or halts or slows an existing decline in quality, e.g. increasing the extent of a habitat of conservation value; or
 - ii. Negative a change that reduces the quality of the environment, e.g. destruction of habitat.
- b. Spatial extent – the spatial or geographical area or distance over which the impact or effect may occur under a suitably representative range of conditions;
- c. Magnitude – the 'size', 'amount' or 'intensity' and 'volume' of an impact – this is described on a quantitative basis where possible;
- d. Duration – the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
- e. Timing and frequency – i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons; and
- f. Reversibility – i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and enforceable. A permanent effect is one from which recovery is either not possible or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).

12.7.19 Combined, these characteristics form the magnitude criteria for effects of the Proposed Development on important ecological features as summarised in **Table 12-9**.

Table 12-9: Magnitude criteria for effects

Magnitude	Magnitude criteria
High	Changes to an ecological feature that almost always have an adverse effect on its integrity or conservation status. Such changes are usually long-term and often permanent and/or irreversible.
Medium	Adverse changes on an ecological feature that, in some circumstances, may affect its integrity or conservation status. Although such changes may be long-term, they are potentially reversible.
Low	Adverse changes on an ecological feature that do not usually change its integrity or conservation status. Such changes are often short-term and/or reversible.
Very low	There is no noticeable change on the ecological feature.

Effect Significance

12.7.20 For each ecological feature, only those characteristics relevant to understanding the ecological effect of the Proposed Development and determining the significance are described. The determination of the significance of effects will be made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- a. Not significant – no noticeable effect on structure and function, or conservation status; and
- b. Significant – structure and function, or conservation status is affected.

12.7.21 Sections 5.24 to 5.28 of the CIEEM guidelines (Ref. 37) state that effects should be determined as being significant when “...an effect either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national / local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local. A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)”.

12.7.22 Using this information and judgment, it is determined whether the effects will be significant or not on the structure and integrity (of site or ecosystems) or conservation status (of habitats and/or species) of each ecological feature and the effect significance is determined at the appropriate geographical scale.

12.7.23 There are a number of approaches for determining the significance of effects on ecological features. Whilst the CIEEM guidelines (Ref. 37) recommend the avoidance of the use of the matrix approach for categorisation (i.e. major,

moderate and minor), in order to provide consistency of terminology within the ES, the findings of the CIEEM-based assessment will be translated into the classification of effects scale, as outlined in **Table 12-10**, but still remain consistent with the CIEEM guidelines.

Table 12-10. Relating CIEEM assessment terms to those used in other EIA chapters

Effect classification terminology used in the EIA	Equivalent CIEEM assessment terminology
Major beneficial	Beneficial effect on structure/function or conservation status at Regional, National or International level.
Moderate beneficial	Beneficial effect on structure/function or conservation status at County and District level.
Minor beneficial	Beneficial effect on structure/function or conservation status at Local level.
Negligible	No noticeable effect on structure/function or conservation status.
Minor adverse	Adverse effect on structure/function or conservation status at Local level.
Moderate adverse	Adverse effect on structure/function or conservation status at County and District level.
Major adverse	Adverse effect on structure/function or conservation status at Regional, National or International level.

12.7.24 As a rule, major and moderate effects are considered to be 'significant', whilst minor and negligible effects are considered to be 'not significant'. Albeit minor effects could be considered significant at a local scale. Professional judgement will be applied, including taking account of whether the effect is permanent or temporary, its duration and frequency, whether it is reversible, and/or its likelihood of occurrence.

12.8 Assumptions, Limitations, and Uncertainties

- 12.8.1 Limitations pertaining to the gated assessments are set out in the reports referenced above and their context or continued relevance will be described in the Aquatic Ecology ES Chapter.
- 12.8.2 Aquatic ecological assessments at Gate 3 have been informed by parallel development of the engineering design, and on-going hydraulic and hydrological modelling, and water quality monitoring and modelling. Where possible, the results of the latest available monitoring and modelling has been used to inform the Gate 3 environmental assessments. However, it has sometimes been necessary, due to the timescales of concurrent workstreams, to rely on previous iterations of such monitoring and modelling. Therefore, the EIA will need to be supported by the final engineering design and modelling, to accurately support the assessment of potential effects of the Proposed Development.
- 12.8.3 It is assumed that the ST Water Resources Management Plan (WRMP24) (Ref. 63) Aquator model provides the best available representation of how

water resources are managed within the Water Resources Zone (WRZ) relevant to the SROs. This includes the operation based on current control rules linked with abstraction licence and discharge conditions within the WRZ. Whilst this representation is correct within the model context, this does not necessarily reflect how the system is operated historically and how decisions are (or were) made in the real-world context. Comparison with historical events is therefore constrained.

- 12.8.4 The model also provides a simplified representation of other abstractions (i.e. non-public water supply) and discharges through lumping/aggregation into sub-catchments. These are not all geo-spatially representative of inflow locations.
- 12.8.5 In consultation with the Environment Agency during Gate 3 studies, it was agreed that the ST WRMP24 Aquator model was a suitable tool to use to simulate future flows for low flows down to Q99 (a river flow that is exceeded 99% of the time, i.e. a very low flow).
- 12.8.6 The scope of assessment presented in this chapter reflects the information and stakeholder responses obtained and evaluated at the time of reporting, and has referenced published data, records and web-based information obtained to date.
- 12.8.7 Specific assumptions and limitations relevant to each survey, including how any limitations have been overcome, are included within the relevant technical reports listed within **Appendix 12-1** within Volume 3 of this EIA Scoping Report. There are no survey-specific constraints that represent a significant limitation or data gap and the baseline that has been established is suitably robust, having been developed and refined through Gate 1, Gate 2, and Gate 3.

12.9 Approach to Mitigation

- 12.9.1 Mitigation options will be set out in detail in the Aquatic Ecology ES Chapter. Likely mitigation options have been developed through Gate 1, Gate 2, and Gate 3, in consultation with regulators and stakeholders as described earlier in this chapter. These mitigation options will be further developed through EIA, in continued liaison with the engineering design workstreams and stakeholders.
- 12.9.2 Where practicable, mitigation measures will be incorporated into the design of the Proposed Development and/or how it shall be constructed. Through iterative assessment, potential impacts will be predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as practicable. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset. This embedded mitigation/mitigation by design approach will be considered when evaluating the significance of the potential effects.
- 12.9.3 The impact assessments will be undertaken following consideration of the embedded mitigation measures established through working with the design and engineering workstreams and any construction mitigation that will be specified within a Code of Construction Practice (CoCP), submitted with the DCO application.

- 12.9.4 Mitigation options and requirements will be tracked through a Commitments Register, to be updated through the duration of the EIA.

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- Ref. 61 BBC (2010) Warning over Daventry reservoir algae outbreak.
- Ref. 62 Met Office (2018) UKCP18 Guidance: Representative Concentration Pathways.
- Ref. 63 Severn Trent Plc (2024) Water Resources Management Plan 2024 (WRMP24).

Chapter 13: Ecology - Terrestrial

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13. Ecology – Terrestrial

13.1 Introduction

- 13.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on terrestrial ecology, including sites designated for nature conservation, terrestrial habitats, protected species, notable species and terrestrial Invasive Non-native Species (INNS).
- 13.1.2 This chapter is informed by a suite of previous work including investigations of the Grand Union Canal (GUC) and Minworth Strategic Resource Option (SRO) schemes at Regulatory Alliance for Progressing Infrastructure Development (RAPID) Gate 1, Gate 2, and Gate 3. The investigation reports prepared at Gates 1-2 are listed in **Appendix 13-1: Baseline Ecological Data** within Volume 3 of this EIA Scoping Report. All RAPID documents are available on the Affinity Water website (Ref. 1). Gate 3 reports will be published in due course on the Affinity Water website and, where relevant, the results of Gate 3 investigations are reported within this EIA Scoping Report.
- 13.1.3 This chapter is supported by:
- a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 13-1: Statutory Designated Sites of Nature Conservation Importance;**
 - ii. **Figure 13-2: Non-Statutory Designated Sites of Nature Conservation Importance;**
 - iii. **Figure 13-3: Ancient Woodland;**
 - iv. **Figure 13-4: Priority Habitats;** and
 - v. **Figure 13-5: Standing Water.**
 - b. The following appendices in Volume 3 of this EIA Scoping Report:
 - i. **Appendix 7-1: HRA Screening Report;** and
 - ii. **Appendix 13-1: Baseline Ecological Data.**

13.2 Legislation, Planning Policy Context, and Guidance

- 13.2.1 Legislation, planning policy and guidance relating to terrestrial ecology is outlined below. This informs the selection of study area, identification of ecological features that could be affected and their sensitivity, and the assessment methods.

Legislation

- 13.2.2 International treaties of relevance include the Convention of Biological Diversity (Ref. 2) and the Ramsar Convention 1971 (Ref. 3).
- 13.2.3 The applicable legislation transposed nationally includes:
- a. National Parks and Access to the Countryside Act 1949 (Ref. 4);

- b. Wildlife and Countryside Act 1981 (as amended) ('W&C ACT') (Ref. 5);
- c. Protection of Badger Act 1992 (Ref. 6);
- d. Countryside and Rights of Way (CROW) Act 2000 (Ref. 7);
- e. Animal Welfare Act 2006 (Ref. 8);
- f. Natural Environment and Rural Communities Act 2006 (Ref. 9);
- g. Environment Act 2021 (Ref. 10);
- h. The Hedgerow Regulations 1997 (Ref. 11);
- i. The Conservation of Habitats and Species Regulations 2017 (Ref. 12); and
- j. The Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref. 13).

National Policies, Plans and Strategies

- 13.2.4 The relevant national policies, plans and strategies for terrestrial ecology are summarised within **Table 13-1**. These documents have informed the assessment methods, identification of ecological features, and selection of appropriate study area described in the sections that follow.

Table 13-1: National Policies, Plans and Strategies – Terrestrial Ecology

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 14)	• Section 1.6 Sustainability considerations; • Section 1.7 Habitats considerations; • Section 3 Assessment principles; – Section 3.1 General principles of assessment; – Section 3.2 EIA; – Section 3.3 HRA; – Section 3.4 Environmental Net Gain; and, • Section 4.3 Biodiversity and nature conservation.	The National Policy Statement (NPS) sets out the assessment principles for: • EIA – this chapter details the approach to EIA for terrestrial ecology receptors; • HRA – the terrestrial ecology assessment set out in this chapter will support the HRA; • Environmental Net Gain, and Biodiversity and nature conservation, including the approach to mitigation, habitats sites, protected habitats and species, and Biodiversity Net Gain (BNG) – the terrestrial ecology assessment will inform the approach to mitigation in relation to terrestrial ecology receptors.
National Planning Policy Framework (NPPF) (Ref. 15)	Conserving and enhancing the natural environment, Section 15 paragraphs 192 – 195 on protecting and enhancing biodiversity.	The NPPF sets out the Government's planning policies for England and how these are expected to be applied, which includes conserving and enhancing the natural environment. The requirements of the NPPF for the assessment of developments with regards to terrestrial ecology will need to be satisfied by the assessment methodology presented within this chapter. Furthermore, the NPPF will inform the development of design principles and embedded mitigation proposals for the Proposed Development.
25-year Environment Plan (Ref. 16)	The 25 Year Environment Plan sets out the Government's plan to help the natural world regain and retain good health. It aims to deliver cleaner air and water in cities and rural landscapes, protect	The 25 Year Environment Plan informs the policy context that will be used for the development of design principles and embedded mitigation proposals for the Proposed Development.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first. The plan establishes 25-year environmental goals and strategies for environmental management through actions on six key areas of focus. The Environment Act 2021 (Ref. 6) establishes a legal foundation for the Government to implement the 25 Year Environment Plan.	
Environmental Improvement Plan 2023 (Ref. 17)	The Environmental Improvement Plan 2023 for England is the first revision of the 25 Year Environment Plan. It builds on the 25 Year Environment Plan's vision with a new plan setting out how the Government will work with landowners, communities and businesses to deliver each of the goals for improving the environment, matched with interim targets to measure progress. The Plan aims to halt the decline in biodiversity, in order to achieve thriving plants and wildlife, and implements the Environment Act 2021, including rolling out Local Nature Recovery Strategies to identify areas to create and restore habitat, and Biodiversity Net Gain to enhance the built environment.	The Plan informs the development of design principles and embedded mitigation proposals for the Proposed Development.

Local Policy

- 13.2.5 The local policies listed in **Table 13-2** are considered relevant to the scope and method of assessment of potential terrestrial ecological effects, including for the definition of Important Ecological Features.

Table 13-2: List of relevant local policy – Terrestrial Ecology

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: Section 6: Environment and Sustainability. Policies TP7: Green infrastructure network and TP8: Biodiversity and geodiversity.	Ref. 18	Policy TP7 outlines the importance of green infrastructure to the development plan and prohibits any proposal which would sever or reduce a green infrastructure link. Policy TP8 outlines the importance of sites of local and national importance for biodiversity such as Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR) and prohibits developments which may cause harm to these sites. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	New Local Plan for Birmingham 2042 Chapter 9 Climate and Environment – Policies CE9 Green infrastructure and nature recovery; CE10 Biodiversity and geodiversity.	Ref. 19	Policy CE9: Green Infrastructure and Nature Recovery. Outlines plans for creation and connectivity of new and existing green infrastructure. Also requires new development schemes to incorporate appropriate tree planting. Policy CE10: Biodiversity and Geodiversity. Outlines the importance of sites of local and national importance for biodiversity such as SSSIs and LNRs and prohibits developments which may cause harm to these sites. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033:Chapter 10: Environment: LP16: Natural Environment; LP17: Green Infrastructure;	Ref. 20	LP16: Natural Environment, outlines ambitions to minimise impacts and achieve net gains on biodiversity and outlines protective measures for Sites of Regional and Local Importance for Nature Conservation and irreplaceable habitats such as ancient woodland.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	LP18: Tame Valley Wetlands NIA including Kingsbury Water Park; LP19: Local Nature Reserve; and LP20: Green Spaces.		LP17: Green Infrastructure. Outlines policy to maintain, enhance and protect green infrastructure. LP18: Tame Valley Wetlands Nature Improvement Area (NIA) including Kingsbury Water Park. This policy summarises the importance of this NIA which encompasses 5 SSSIs, 12 LNRs and 48 Local Wildlife Sites (LWSs). It also suggests the use of the NIA as a mitigation site for habitat loss. LP19: Local Nature Reserves. Lists LNRs to be protected and enhanced. LP20: Green Spaces. Outlines green spaces to be retained, protected and enhanced. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: Chapter 12: Natural Environment: Policy NE1 – Green Infrastructure. Policy NE2 – Open Space. Policy NE3: Biodiversity and Geodiversity.	Ref. 21	NE1 – Green Infrastructure. Outlines proposals to create, protect, manage and enhance green infrastructure as well as require new development proposals create new and enhance existing green infrastructure. NE2- Open Space. Outlines requirement for new development to create green network of linked open spaces such as local parks and allotments and improve public access to nature. NE3: Biodiversity and Geodiversity. Outlines requirements for developments to conserve, enhance, restore and possibly create sites of local and national ecological importance and encourages planning to prevent fragmentation of habitats. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Borough Plan Review 2021-2039	Ref. 22	No new policies for terrestrial ecology identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Coventry City Council	Coventry Local Plan (2011-2031): Chapter 7. Green Belt and Green Environment: Policy GB1: Green Belt and Local Green Space; Policy GB2: Safeguarded Land in the Green Belt; Policy GE1: Green Infrastructure; Policy GE2: Green Space; and Policy GE3. Biodiversity, Geological, Landscape and Archaeological Conservation.	Ref. 23	Policy GB1: Green Belt and Local Green Space. States that no inappropriate development is permitted in the Coventry Green Belt and development within Local Green Space is only permissible in certain circumstances. Policy GB2: Safeguarded Land in the Green Belt. Outlines sites of Safeguarded Land which require review of the Local Plan before development. Policy GE1: Green Infrastructure. Outlines protections for green infrastructure including a requirement for developments to maintain its quality, quantity and function as well as making provisions to improve its connectivity and assist with species movement. Policy GE2: Green Space. Outlines policy not permitting development which results in the loss of green space. If such development is unavoidable the green space will be replaced by equivalent or better provision. Policy GE3. Biodiversity, Geological, Landscape and Archaeological Conservation. States that sites of regional and local importance such as SSSIs and LNRs will be protected and enhanced as well as encouraging biodiversity in more nature deprived areas. Policy GE4: Tree Protection. Outlines protections for trees against loss and damage as a result of development. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Local Plan Review: Issues and Options Consultation (2023)	Ref. 24	No new policies for terrestrial ecology identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: Chapter 9: Natural Environment: Policy NE1: Protecting Designated Biodiversity and Geodiversity Assets; Policy NE2: Strategic Green and Blue Infrastructure; Policy NE3: Landscape Protection and Enhancement; and Policy SDC2: Landscaping.	Ref. 25	Policy NE1: Protecting Designated Biodiversity and Geodiversity Assets. Outlines protections from the Council to protect designated areas and species of international, national and local importance for biodiversity and geodiversity. Policy NE2: Strategic Green and Blue Infrastructure. Outlines Council's ambitions to create a Green and Blue Infrastructure in the Borough and new developments responsibilities to integrate green infrastructure where possible. Policy NE3: Landscape Protection and Enhancement. Mentions importance of habitat biodiversity features including veteran trees and hedgerows and requires development to enhance and expand these features where possible. Policy SDC2: Landscaping. Requires ecological features to be retained and protected and new planting to be of native species bringing ecological value to the area. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	Rugby Borough Local Plan review – issues and options consultation (2023)	Ref. 26	No new policies for terrestrial ecology identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: Chapter 10: Built and Natural Environment;	Ref. 27	Policy BN1: Green Infrastructure Connections. Outlines importance of green infrastructure and responsibilities of developments to contribute to its conservation, management and enhancement.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Policy BN1: Green Infrastructure Connections; Policy BN2: Biodiversity; Policy BN3: Woodland Enhancement and Creation; Policy BN4: Upper Nene Valley Gravel Pits Special Protection Area; and Policy BN8 – The River Nene Strategic River Corridor.		Policy BN2: Biodiversity. States that development which maintains and enhances existing designated sites and results in biodiversity net gain will be supported. Policy BN3: Woodland Enhancement and Creation. Development seeking to enhance and manage existing woodland will be supported and veteran trees will be protected. Development predicted to fragment or damage woodland will not be permitted unless benefits will outweigh loss. Policy BN4: Upper Nene Gravel Pits Special Protection Area (SPA). The development is prohibited from adversely impacting special protection area and Ramsar site including species for which land is designated and loss of supporting habitat. New development within 250 m zone of the SPA must demonstrate that it will not have an adverse effect on birds. Policy BN8: The River Nene Strategic River Corridor. Mentions the need for development to understand importance of River Nene for biodiversity and states it should be enhanced and protected. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: Chapter 9: The Built and Natural Environment: Policy ENV4: Green Infrastructure; Policy ENV5: Biodiversity; and	Ref. 28	Policy ENV4: Green Infrastructure. Outlines Council's policy to protect, enhance and restore green infrastructure to contribute to biodiversity and climate change mitigation. This includes the Nene Valley NIA project which aims to restore habitat and connectivity in this area. Policy ENV5: Biodiversity. Outlines proposals to conserve and enhance sites of importance for biodiversity and prohibits

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Policy ENV6: Daventry Country Park and Grand Union Canal Link.		damage to these sites through development. Any development should achieve net gain for biodiversity. Policy ENV6: Daventry Country Park and Grand Union Canal Link. Outlines Council's proposals to enhance important existing habitats in the park and to link the GUC and town centre via natural and semi natural green space. Any further development should preserve or enhance habitats in Daventry Reservoir Conservation Area and the Grand Union Canal Conservation Area. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	New Local Plan for West Northamptonshire 2041 Chapter 12: Built and Natural Environment: Policy BN9: Nature Conservation; Policy BN10: Biodiversity Net Gain; Policy BN11: Trees and Woodland; Policy BN12: Trees and Hedgerow in Developments; Policy BN13: Green and Blue Infrastructure and Development; Policy BN14: Green and Blue Infrastructure Corridors; and Policy BN15: Upper Nene Valley Gravel Pits Special Protection Area.	Ref. 29	Policy BN9: Nature Conservation. Outlines requirements for development to protect, maintain and enhance biodiversity including avoiding harm, mitigation and compensation and achieving biodiversity net gain for projects. Development must avoid adverse effects on statutory and non-statutory designated ecological sites and priority species and habitats. Policy BN10: Biodiversity Net Gain. Outlines requirements for development to achieve at least 10% biodiversity net gain and outlines how this may be achieved. Policy BN11: Trees and Woodland. Outlines Council proposals to support the UK Tree Strategy and the England Tree Action Plan to increase tree cover and protect and enhance woodland as well as encourage habitat diversity. Policy BN12: Trees and Hedgerow in Developments. Outlines proposals for development to protect and enhance existing trees, woodland and hedgerows.

Local authority	Relevant local policy	Reference	Relevance to the assessment
			Policy BN13: Green and Blue Infrastructure and Development. Outlines Council proposals to sustain and enhance as well as create green and blue infrastructure. Policy BN14: Green and Blue Infrastructure Corridors. Outlines proposals to enhance, manage and integrate green and blue infrastructure corridors into new developments. Policy BN15: Upper Nene Valley Gravel Pits SPA. Outlines protections for this area and requirement for developments to undergo assessments to avoid negative impacts to these areas where possible including a 250 m buffer zone from the SPA and Ramsar site for birds. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
Milton Keynes City Council	Plan: MK 2016 – 2031: Chapter 12: Environment, Biodiversity and Geodiversity: Policy NE1: Protection of Sites; Policy NE2: Protected Species and Priority Species and Habitats; Policy NE3: Biodiversity and Geological Enhancement; and Policy NE4: Green Infrastructure.	Ref. 30	Policy NE1: Protection of Sites. Outlines protections of nature conservation sites and prohibits development which will harm these sites. Lists exceptions where development may proceed in these sites. Policy NE2: Protected Species and Priority Species and Habitats. States development will not be permitted if it will cause harm to protected species or habitats. Where this is unavoidable, development should promote preservation, restoration or re-creation where possible. Policy NE3: Biodiversity and Geological Enhancement. Outlines requirements for development to maintain and protect biodiversity and achieve biodiversity net gain for projects. Policy NE4: Green Infrastructure. Outlines requirement for development to provide new green infrastructure or enhance

Local authority	Relevant local policy	Reference	Relevance to the assessment
			existing green infrastructure and avoid habitat fragmentation as well as protect ecological corridors such as water courses. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	New City Plan: Ambition and Objectives Consultation 2023	Ref. 31	Climate and Environmental Action Theme: Requires new developments to create space for nature and deliver significant goals in biodiversity. This theme is relevant to defining the design principles and embedded mitigation proposals for the Proposed Development.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: Chapter 9: Natural Environment: NE1: Biodiversity and Geodiversity; NE2: River and stream corridors; NE6: Local Green Space; and NE8: Trees, hedgerows and woodlands.	Ref. 32	NE1: Biodiversity and Geodiversity. Outlines protections for important ecological sites and species and prohibits development in these areas unless there are “exceptional circumstances.” Also outlines requirements for biodiversity net gain for development. NE2: River and stream corridors. Prohibits development from having a negative impact on watercourses and their corridors and requires development to conserve and enhance their biodiversity. NE6: Local Green Space. Mentions richness of wildlife as part of requirements for small scale development in green spaces. NE8: Trees, hedgerows and woodlands. Outlines requirements for development to enhance, expand and protect woodland and hedgerows. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives	Ref. 33	Natural and Built Environment. Outlines aim to conserve and enhance natural environment by protecting the Chilterns

Local authority	Relevant local policy	Reference	Relevance to the assessment
			National Landscape and green belt from inappropriate development and creating new priority habitats which will also increase biodiversity net gain. These aims are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: Chapter 15: Environmental Enhancement: Policy EE1: Green Infrastructure; Policy EE2: Enhancing Biodiversity; Policy EE3: Nature Conservation; Policy EE4: Trees, Woodlands and Hedgerows; Policy EE8: Greensand Ridge Nature Improvement Area; Policy EE9: Forest of Marston Vale; Policy E11: The River and Waterway Network; and Policy E13: Outdoor Sport, Leisure and Open Space.	Ref. 34	Policy EE1: Green Infrastructure. Outlines requirements for all development to link, enhance and extend green infrastructure where possible and protect existing green infrastructure. Policy EE2: Enhancing Biodiversity. Outlines requirements for developments to conserve habitats, species and important ecological sites and achieve biodiversity net gain and avoid negative impacts on these sites. Policy EE3: Nature Conservation. Outlines requirements for important habitats to be protected, maintained and enhanced. Development will not be permitted where it will have an adverse impact on important ecological sites such as SSSIs and LNRs or species and habitats of principal importance. Policy EE4: Trees, Woodlands and Hedgerows. Outlines requirements for development to protect woodland including ancient woodland and veteran trees and mitigation for any woodland or hedgerow loss. Policy EE8: Greensand Ridge Nature Improvement Area. Development in this area must demonstrate biodiversity net gain and enhance wildlife networks and connectivity. Policy EE9: Forest of Marston Vale. Outlines ecological requirements for development in this area including retaining and protecting trees and hedgerows.

Local authority	Relevant local policy	Reference	Relevance to the assessment
			Policy E11: The River and Waterway Network. Any development adjacent to rivers and waterways must protect, conserve and enhance waterway biodiversity. These policies are relevant to defining the scope of the assessment, the design principles and embedded mitigation proposals for the Proposed Development.

Guidance and Standards

13.2.6 Relevant guidance and standards which have been used as part of the EIA scoping process and will also be considered as part of the EIA include:

- a. Planning Practice Guidance (Ref. 35);
- b. British Standard (BS) 42020:2013 Biodiversity. Code of Practice for Planning and Development (Ref. 36);
- c. Guidelines for Preliminary Ecological Appraisal – 2nd edition (Ref. 37);
- d. Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater (Ref. 38);
- e. Standard Advice for Protected Species from Natural England (Ref. 39); and,
- f. Natural England's Ancient Woodland (Ref. 40) and Woodland Trust Woodland inventory (Ref. 41).

13.3 Consultation

13.3.1 A key element of progressing the GUC and Minworth SROs through the RAPID gated process has been to investigate the environmental risks and opportunities associated with delivery of the Proposed Development. Previous environmental assessments at Gate 1 to Gate 3 have considered Water Framework Directive (WFD) related impacts and benefits, baseline ecological data, and in particular the potential impacts of changes in flow to ecological receptors such as designated sites and their qualifying features, protected and notable species, and constraints from the presence or future spread of Invasive Non-native Species. Environmental assessments have been informed by regular engagement with regulators and stakeholders to provide direction for, and agreement with, the on-going assessments.

13.3.2 Consultation with the National Appraisal Unit (comprising the Environment Agency and Natural England) and relevant stakeholders (e.g. the Canal & River Trust (the 'Trust'); the River Trent Working Group (RTWG); the Trust Fisheries and Angling Advisory Group [FAAG]) has been undertaken throughout the RAPID gated process. This has been critical in informing the scope of on-going assessment at each Gate, and subsequently informing EIA Scoping.

13.3.3 Consultation with key regulators and stakeholders is on-going through the Gate 3 assurance process, whereby Gate 3 deliverables are reviewed and amended for agreement prior to Gate 3 submission. This includes defining the scope of assessment for Gate 4 and EIA.

13.3.4 Key feedback raised through the RAPID gated process, which has been used to inform this EIA scoping chapter includes the following:

- a. Feedback on records of protected and notable species within the Zone of Influence (ZoI) of the Proposed Development from West Midlands Ringing Group, Environment Agency and Natural England;

- b. Feedback received on habitat improvement works implemented and proposed, e.g. by Severn Trent and the West Midlands Ringing Group and by the Environment Agency. For example, Environment Agency identified locations of habitat enhancement proposed along Part 1b of the Proposed Development and Part 2 canal network, e.g. water vole recovery project at Hawkesbury Junction (at Coventry and Oxford Canals) and hedge replacement near Hurley, Warwickshire, which should be considered as part of the future baseline; and
- c. Feedback received on water vole survey methods and assessment from Natural England. In particular, Natural England raised their preference for water voles to be captured and directly released into a receptor site instead of captive breeding and later release (to reduce mortality rates).

13.3.5 In addition, a summary of key issues raised during non-statutory consultation with regards to terrestrial ecology is provided below:

- a. Concerns that Part 4a Site B is located within the Greensand Ridge Nature Improvement Area;
- b. Concerns raised about the interface of the Proposed Development with the delivery of biodiversity opportunities identified in local plans;
- c. Concerns raised about impacts and mitigation for protected species; and
- d. Comments raised regarding existing works along the canal network, which should be considered as part of the future baseline.

13.3.6 These issues will be addressed accordingly in the next stage of the EIA. Furthermore, consultation is yet to be conducted with various consultees, including Local Wildlife Trusts, local planning authority council ecologists, and the Royal Society for the Protection of Birds (RSPB). Consultation with other groups may also be required, such as local wildlife organisations and groups (e.g. local badger groups) and landowners. This will be progressed to inform the preparation of the Environmental Statement (ES).

13.4 Study Area

13.4.1 This section sets out the study areas adopted for each element of the Proposed Development in relation to terrestrial ecology. Desk and field-based studies have been undertaken to establish the ecological baseline that may be impacted by the Proposed Development. The scale of the desk-based assessment's study areas varies dependent upon the ecological feature being assessed and its vulnerability to change resulting from construction and operation of the Proposed Development (the predicted Zone of Influence (Zoi) of the Proposed Development). The desk-based assessment's study areas are summarised within **Table 13-3**. Ecological features outside of these study areas are unlikely to be affected by the Proposed Development and are not considered in this report.

13.4.2 Where required, surveys will be conducted on ecological features that are known or likely to be present within the predicted Zoi of the Proposed Development. Based on the nature of the Proposed Development and the current design, the initial survey areas set out within **Table 13-3** have been deemed sufficient based on relevant guidance and best practice. Additional

survey areas for important ecological features may be required, if the design of the Proposed Development is amended or evidence of protected/notable species is identified during the initial surveys.

- 13.4.3 The extent of the protected/ notable species survey area is species dependent. Species selected for ecological surveys have been determined based on the results of the desk study and initial habitat survey.

Table 13-3: Ecological features, desk-based study areas and survey areas – Terrestrial Ecology

Ecological Features	Study area distance*
<i>Desk Study</i>	
Internationally and nationally designated nature conservation sites, including Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar Sites, National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR),	2 km (extended for European sites designated for bats to 30 km (Ref. 40, Ref. 42) and to 20 km for birds (Ref. 43) (extended to 10 km downstream where hydrological connectivity has been identified)
Locally designated nature conservation sites, including Local Wildlife Sites (LWS) and RSPB reserves	2 km
Protected and notable species**	2 km
To identify waterbodies for Great Crested Newts (GCN)	500 m
Ancient woodland and UK Priority Habitats	200 m
<i>Field Surveys</i>	
Bat roosts (buildings/structures, including bridges, and trees)	20 m
Badger Sett	50 m
Habitat Suitability Index (HSI) assessments of waterbodies for GCN	Up to 500 m
Otter terrestrial habitat	200 m

Ecological Features	Study area distance*
Other ecological assessments including habitats (including priority habitats), botanical features, habitat condition assessment, breeding birds, terrestrial invertebrates, reptiles and bat activity.	Within site boundary
Water vole and otter aquatic habitat	Part 1a: N/A
	Part 1b: 100 m up and downstream of watercourses crossed
	Part 2: Within canal network, 2 km upstream and downstream along connecting or adjacent waterbodies
	Part 3: Within reservoirs
	Part 4a: 100 m up and downstream of watercourses crossed
	Part 4b: Within site boundary

* The study area distances will be measured from the site boundary for Parts 1, 3 and 4 of the Proposed Development (defined as the EIA Scoping Boundary within this EIA Scoping Report, but noting that the site boundary may change as part of the EIA process). For Part 2 of the Proposed Development, the distances will be measured from the Indicative Work Area only.

** Extended to a further 5 km from the Indicative Work Area only for water voles on any watercourses connecting to the Part 2 canal network.

13.5 Baseline Conditions

Existing Baseline – Summary

Sources of Baseline Information

- 13.5.1 Data used to inform the desk-based assessment set out in this section are outlined in **Table 13-4**.

Table 13-4: Sources of baseline data – Terrestrial Ecology

Data Source	Content
Local Ecological Record Centres (LERC)*: Bedfordshire and Luton Biodiversity Recording and Monitoring Centre. Buckinghamshire and Milton Keynes ERC EcoRecord, Leicestershire and Rutland Environmental Record Centre, Northamptonshire Biodiversity Record Centre, Warwickshire Biological Record Centre	Biological records data Priority habitats Ecological Network Mapping Non-statutory designated sites INNS
NE and Multi-Agency Geographic Information for the Countryside (MAGIC) (Ref. 44)	Statutory designated sites Ancient Woodland Inventory Granted European Protected Species (EPS) Licences Priority habitats

** It is noted that the data collection from LERCs is ongoing and, where available, has been included within this chapter. Full baseline information will be provided within the ES.*

- 13.5.2 The raw data are provided in order from Part 1 to Part 4 of the Proposed Development on **Figures 13-1** and **13-5** within Volume 2 and detailed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report. Full species citations are not provided. Lists of statutory designated sites, non-statutory designated sites, ancient woodland and priority habitat type are included within **Appendix 13-1**.

Statutory Designated Sites

- 13.5.3 Statutory designated sites of nature conservation importance identified within the study areas are shown on **Figure 13-1** within Volume 2 and detailed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report. Water Framework Directive (WFD) waterbodies connected to the Proposed Development are shown on **Figure 12-3** within Volume 3 of this EIA Scoping Report, indicating where hydrological connectivity may exist.
- 13.5.4 There are three internationally designated sites within the study area relevant to the terrestrial ecology assessment: Ensor's Pool SAC / SSSI / LNR, Upper Nene Valley Gravel Pits SPA / Ramsar and Chilterns Beechwoods SAC / SSSI.
- 13.5.5 Humber Estuary SAC / Ramsar / SSSI, River Mease SAC / SSSI and River Blythe SSSI are considered within **Chapter 12: Ecology – Aquatic** of this EIA Scoping Report and have not been included within the scope of the terrestrial ecology assessment. Further consideration for hydrologically

connected designated sites can be found within **Appendix 7-1** included within Volume 3 of the EIA Scoping Report.

- 13.5.6 Of the sites within the terrestrial ecology assessment study area, Ensor's Pool SAC / SSSI / LNR is the closest to the EIA Scoping Boundary. It is a former marl pit located 1.1 km south-west of the EIA Scoping Boundary (Part 2 between the Atherstone to Nuneaton section) and is an inland standing water body originally designated for its extensive population of white-clawed crayfish *Austropotamobius pallipes*. Ensor's Pool is not hydrologically connected to the Proposed Development, as described within **Chapter 12: Ecology – Aquatic** of this EIA Scoping Report, nor is it designated for bats nor birds. As such Ensor Pool SAC / SSSI / LNR is scoped out of further assessment.
- 13.5.7 Upper Nene Valley Gravel Pits SPA / Ramsar is located 7.05 km to the east of the Part 2 EIA Scoping Boundary (Indicative Work Area), near Northampton. Its collection of both active and disused sand and gravel pits including open water, reed swamps, marshes, pastures and grasslands provide varied foraging and resting habitat to over 20,000 wintering birds. **Chapter 12: Ecology – Aquatic** of this EIA Scoping Report identifies a potential impact pathway during construction and operation on water quality due to the works to Drayton and Daventry Reservoirs, which are upstream in the headwaters of the River Nene catchment. As such, the Upper Nene Valley Gravel Pits SPA / Ramsar has been scoped in for further assessment.
- 13.5.8 Chilterns Beechwoods SAC / SSSI, located approximately 3 km south of the Part 4b SP5 pipeline option, is designated for its beech forests and woodland flora, which form an important part of a semi-natural dry grassland-scrub-woodland mosaic. The site is not hydrologically connected to the Proposed Development, nor is it designated for bats nor birds. As such, Chilterns Beechwoods SAC / SSSI is scoped out of further assessment.
- 13.5.9 A total of 39 statutory designated sites of nature conservation importance were identified within the study area. These comprise one SAC, SSSI and LNR (Ensor's Pool), one SPA and Ramsar site (Upper Nene Valley Gravel Pits), one SAC and SSSI (Chilterns Beechwoods), one site designated as both SSSI and LNR (Totternhoe Knolls), additional 24 SSSIs, one NNR (King's Wood and Rushmere), and ten additional LNRs. These sites are summarised in **Table 13-5**. In addition, the Combe Pool SSSI, which may be hydrologically connected to the EIA Scoping Boundary, is located 2.7 km from Part 2 of the Proposed Development at Bedworth to Rugby. Ten SSSIs or LNRs reference birds as a qualifying feature within their citation: Ashlawn Cutting LNR, Bentley Park Wood SSSI, Blow's Down SSSI, Combe Pool SSSI, Cottage Bottom Fields LNR, Ivinghoe Hills SSSI, Kingsbury Wood SSSI / LNR, Swift Valley LNR, Whitacre Heath SSSI and Wyken Slough LNR.

Table 13-5: Statutory Designated Sites of Nature Conservation Importance within the Study Area – Terrestrial Ecology

Part of the Proposed Development	Designation and Site Name	Distance (km) to EIA Scoping Boundary
Part 1a: Minworth AWTP	None	N/A
Part 1b: Minworth to Atherstone Pipeline	Whitacre Heath SSSI	Adjacent**
	Kingsbury Wood SSSI / LNR	0.82
	Kingsbury Meadow LNR	1.21
	Bentley Park Wood SSSI	Adjacent
Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals	Ashlawn Cutting LNR	1.85
	Bentley Park Wood SSSI	1.5
	Blue Lagoon LNR	1.74
	Boon's Quarry SSSI	0.22
	Bugbrooke Meadows SSSI	0.72
	Combe Pool SSSI	2.7
	Daventry Country Park LNR	0.70
	Ensor's Pool SAC / SSSI / LNR	0.96
	Griff Hill Quarry SSSI	1.47
	King's Wood and Rushmere NNR	Adjacent
	Illing's Trenches SSSI	0.86
	Linnell Road LNR	0.27
	Nares Gladley Marsh SSSI	1.37
	Newbold Quarry Park LNR	0.22
	Poker's Pond Meadow SSSI	1.0
	Roade Cutting SSSI	1.56
	Swift Valley LNR	1.19
	Tiffield Pocket Park	1.85
	Upper Nene Valley Gravel Pits SPA / Ramsar	7.05
	Combe Pool SSSI	2.7
	Woodlands Quarry SSSI	0.43
	Wyken Slough LNR	Within
Part 3: Daventry and Drayton Reservoirs	Daventry Country Park LNR	Within
Part 4a: Abstraction, Treatment and Storage Site	Blue Lagoon LNR	1.32
	Chilterns Beechwoods SAC / SSSI	6.52
	Blow's Down SSSI	0.92

Part of the Proposed Development	Designation and Site Name	Distance (km) to EIA Scoping Boundary
Part 4b: Pipeline to Underground Reservoir Near Luton *	Chilterns Beechwoods SAC / SSSI	3.0
	Cottage Bottom Fields LNR	0.10
	Dallow Downs and Winsdon Hill SSSI	0.06
	Double Arches Pit SSSI	0.56
	Dunstable and Whipsnade Downs SSSI	Adjacent
	Ivinghoe Hills SSSI	1.32
	King's Wood and Rushmere NNR	Adjacent
	Kensworth Chalk Pit SSSI	Adjacent
	Kings and Bakers Wood and Heaths SSSI	Adjacent
	Nine Aches Pit SSSI	0.74
	Totternhoe Stone Pit SSSI	0.89
	Totternhoe Chalk Quarry SSSI	1.15
	Totternhoe Knolls SSSI LNR	0.58
	Wavendon Heath Ponds SSSI	1.9

* Closest distance to Part 4b EIA Scoping Boundary provided, where the designated site is within the study area for multiple pipeline route options. Further detailed information is provided in **Appendix 13-1** within Volume 3 of this EIA Scoping Report.

** Sites referred to as 'adjacent' are located immediately next to the EIA Scoping Boundary but outside of it.

13.5.10 SSSI Impact Risk Zones and their specific impact descriptions will be fully reviewed and considered as part of the EIA.

Non-Statutory Designated Sites

13.5.11 There are 487 non-statutory designated sites within the study area for the Proposed Development, as shown on **Figure 13-2** within Volume 2 and detailed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report.

13.5.12 These include 172 Local Wildlife Sites (LWS) and 58 County Wildlife Sites (CWS), four District Wildlife Sites (DWS), one Site of Importance for Nature Conservation (SINC), four Sites of Local Importance for Nature Conservation (SLINC) and one SINC / SLINC (Minworth Sewage Works). Of these, 74 sites are within the 200 m study area. In total, there are 39 LWS, CWS or SINC/SLINC that are wholly or partially located within the EIA Scoping Boundary.

13.5.13 There are also 239 Potential Local Wildlife Sites (pLWS) or Candidate Local Wildlife Sites (cLWS). Of these, 76 pLWS are within the study area. In total,

there are 45 pLWS that are wholly or partially located within the EIA Scoping Boundary. Records for pLWS and cLWS have only been received by Birmingham, Leicestershire, Northamptonshire and Warwickshire LERC to date.

- 13.5.14 Furthermore, Part 1a of the Proposed Development falls within the Birmingham and the Black Country Nature Improvement Area (NIA), whilst a section of Part 2 near Daventry crosses the Nene Valley NIA and Part 4a Site B falls within the Greensand Ridge NIA.

Ancient Woodland

- 13.5.15 There are 25 areas of Ancient Woodlands within the study area (200 m), which include ancient and semi-natural woodland (ASNW), and ancient replanted woodland (ARW), as shown on **Figure 13-3** within Volume 2 and detailed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report. These are listed in **Table 13-6**.

Table 13-6: Ancient Woodland within the Study Area – Terrestrial Ecology

Part of the Proposed Development	Ancient Woodland Name	Distance (km) to EIA Scoping Boundary
Part 1a: Minworth AWTP	None	N/A
Part 1b: Minworth to Atherstone Pipeline	Bentley Park Wood ARW	Adjacent
	Bentley Park Wood ASNW	0.09
	Drybrooks Wood ARW	0.02
	Dunton Coppice ASNW	Adjacent
	Gallops Hill Wood ASNW	Adjacent
	Gallops Hill Wood ARW	Adjacent
	Holly Thicks ARW	Adjacent
Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals	All Oaks Wood ASNW	0.01
	Purley Park ASNW	0.15
	Rawn Hill Wood ASNW	0.01
	Skewbridge Spinney ARW	0.11
	Unnamed ASNW (east of Spring Wood, Hartshill)	0.15
	Linsdale Wood ASNW	0.13
Part 3: Daventry and Drayton Reservoirs	None	N/A
Part 4a: Abstraction, Treatment and Storage Site	None	N/A
Part 4b: Pipeline to Underground Reservoir Near Luton	Badgerdell Wood ASNW	Adjacent
	Bragenham Wood ASNW	Adjacent
	Unnamed (Bush Wood) ASNW	Adjacent

Part of the Proposed Development	Ancient Woodland Name	Distance (km) to EIA Scoping Boundary
	Bushy Common Wood ASNW	0.10
	Bushy Common Wood ARW	0.11
	Castlecroft Wood (south) ASNW	0.06
	Castlecroft Wood (north) ASNW	0.18
	Duncombe Wood ASNW	0.01
	Duncombe Wood ARW	Adjacent
	Little John's Wood ASNW	0.18
	Slough Wood ASNW	Adjacent
	Sallowspring Wood ASNW	0.03

Priority Habitats

13.5.16 UK Biodiversity Action Plan priority habitats within the study area are shown on **Figure 13-4** within Volume 2 and detailed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report. Eight main habitat type categories, which are wholly or partially located within the EIA Scoping Boundary of the Proposed Development, were identified from the desk study, as summarised in **Table 13-7**.

Table 13-7: Main Priority Habitat Type Categories within the EIA Scoping Boundary – Terrestrial Ecology

Priority Habitats type (which may qualify as priority habitats)	Proposed Development Part					
	Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b
Coastal and floodplain grazing marsh	✓	✓	✓			
Deciduous woodland	✓	✓	✓	✓	✓	✓
Good quality semi-improved grassland *		✓	✓	✓		✓
Lowland fens			✓			
Traditional orchard			✓	✓	✓	✓
No main habitat type*	✓	✓	✓	✓		✓
Lowland Meadows					✓	✓
Lowland calcareous grassland						

[Source: Ref. 44]

* The Priority Habitat Inventory also includes habitat classes which are not priority habitats, but which hold potential importance for conservation of biodiversity in England. These can indicate a mosaic of habitat which may contain priority habitats, have restoration potential and/or contribute to ecological networks.

Habitats

13.5.17 Linear habitats identified within the study area consist of hedgerows, ditches, and flowing water courses; the latter primarily being canals, but also includes rivers, brooks and streams. Information relating to waterbodies has been obtained from the open river dataset and are further detailed in **Chapter 12: Ecology – Aquatic** and **Chapter 22: Water Environment and Flood Risk** of this EIA Scoping Report.

13.5.18 Terrestrial habitats within the EIA Scoping Boundary predominantly consist of arable or pasture fields and adjacent woodland or lines of trees. These habitats are being surveyed in 2024 and 2025, as further described in Section 13.7 of this chapter.

Watercourses and waterbodies

13.5.19 Part 1b of the Proposed Development crosses the River Tame (proposed as a trenchless crossing), Dog Lane Brook main river and seven ordinary watercourses.

13.5.20 There are thirteen watercourses (rivers and canals) which are connected to the canal network and therefore are within the study area (Ref. 49) for terrestrial ecology receptors within Part 2 of the Proposed Development, these include:

- a. Coventry Canal to River Anker;
- b. Coventry Canal to Wem Brook and Ashby de la Zouche Canal;
- c. Oxford Canal to Clifton Brook;
- d. Oxford Canal to Rains Brook;
- e. Oxford Canal to Bragborough Brook;
- f. Oxford Canal to Withy Brook;
- g. Grand Union Canal to Welton village tributary;
- h. Grand Union Canal to River Nene;
- i. Grand Union Canal to River Tove;
- j. Grand Union Canal to River Great Ouse;
- k. Grand Union Canal to Loughton Brook (Milton Keynes);
- l. Grand Union Canal to River Ouzel; and
- m. Ledburn Brook to Grand Union Canal.

13.5.21 Watercourses within the EIA Scoping Boundary of Part 2 of the Proposed Development only include the Oxford Canal, Coventry Canal and Grand Union Canal. The other major watercourses within the study area, listed above, cross or about the existing canal network.

13.5.22 Surface waterbodies of relevance to the terrestrial ecology assessment for Part 3 of the Proposed Development include the Daventry and Drayton reservoirs themselves.

13.5.23 Part 4a site options cross the River Ouzel and ordinary watercourses that are tributaries of these rivers. Part 4b pipeline route options cross the Clipstone Brook, the River Ouzel and several ordinary watercourses. Further

details on watercourses within the EIA Scoping Boundary are provided within **Chapter 22: Water Environment and Flood Risk** of this EIA Scoping Report.

- 13.5.24 Ponds within the study area are shown on **Figure 13-5** within Volume 2 of this EIA Scoping Report. A total of 735 ponds were identified within the study area. Of these, 71 ponds are wholly or partially located within the EIA Scoping Boundary of the Proposed Development.

Existing Baseline – Site Specific

- 13.5.25 This section provides a summary of the baseline surveys and investigations completed in respect of terrestrial ecology through the RAPID gated process, as listed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report.
- 13.5.26 Further detailed information for the baseline desk study information is provided on **Figures 13-1 to 13-4** within Volume 2 and detailed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report.

Part 1a: Minworth AWTP

Desk Study

- 13.5.27 There are no statutory designated sites of nature conservation importance within 2 km of the Part 1a EIA Scoping Boundary. However, the Part 1a EIA Scoping Boundary is located within the Whitacre Heath SSSI Risk Zone.
- 13.5.28 There are twenty non statutory designated sites of nature conservation importance within 2 km of the Part 1a EIA Scoping Boundary, as listed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report. Part of the Minworth AWTP is located within the Minworth Severn Treatment Works Site of Importance for Nature Conservation (SINC). This SINC is split into two parts a northern and southern part. Furthermore, Part 1a of the Proposed Development falls within the Birmingham and the Black Country NIA.
- 13.5.29 The northern part of the SINC supports a diverse range of habitats and associated species adjacent to a channelised stretch of the River Tame. Habitats noted within the SINC citation include the following: broad-leaved woodland, ponds, reed swamp (UK priority habitat), wet woodland (UK priority habitat), bare ground and tall herb. The site is also noted for its ornithological interest.
- 13.5.30 A southern part of the Minworth Severn Treatment Works SINC is located to the south-east of the existing Minworth Wastewater Recycling Centre (WwRC) and supports both grassland and scrub. This SINC also sits next to the Tame Valley SINC (which continues as the River Tame LWS within Warwickshire County Council administrative boundary), which connects Park Hall SINC and Water Orton Sidings SINC to the Minworth Sewage Works SINC. Several other LWS are also connected via the Tame Valley SINC / River Tame LWS with Minworth Sewage Treatment Works SINC.
- 13.5.31 Birmingham & Fazeley Canal SINC is located 60 m north of the Part 1a EIA Scoping Boundary. This canal is not connected to the Proposed Development and as such the habitats along the canal and the SINC are not considered further.

13.5.32 No ancient woodlands were identified within the Part 1a EIA Scoping Boundary or the study area. The following priority habitat types were identified within the Part 1a study area: deciduous woodland, coastal and floodplain grazing marsh, and reference to a non-priority habitat - no main habitat but additional habitats present.

13.5.33 **Table 13-8** summarises the records of protected and notable species identified through the desk study.

Table 13-8: Desk study: Protected and Notable Species within 2 km of the Part 1a EIA Scoping Boundary

Species / Group	Record Description
Amphibians	Including toads, frogs and smooth newts and GCN
Badger	Records to the south of the River Tame
Birds	Barn owl (breeding), fieldfare, green sandpiper, grey partridge, hobby, kingfisher (all Schedule 1 W&C Act species) and other notable species all recorded at Minworth Sewage Works LWS, adjacent to the EIA Scoping Boundary
Bats	Brown long-eared bat, common pipistrelle, Daubenton's bat, noctule bat and soprano pipistrelle
Grass snake	Recorded at Minworth Sewage Works LWS
Otter	Recorded on the River Tame and the Birmingham and Fazeley Canal
Water vole	Recorded on the Birmingham and Fazeley Canal
Other mammals	Hedgehog recorded at Water Orton and other nearby settlements. Polecat recorded at Minworth Sewage Works LWS
Terrestrial invertebrates	Cinnabar moth, blood-vein moth, <i>Lipara rufitarsis</i> (true fly), wall butterfly and small heath butterfly recorded at Minworth Sewage Works LWS
Aquatic invertebrates	<i>Hygrotus nigrolineatus</i> (a water beetle).
Plants	Common cudweed, common spotted orchid, Good King Henry, bluebell
Invasive non-native plants	Water fern, rhododendron, Himalayan cotoneaster, Indian / Himalayan balsam, yellow archangel Unconfirmed records of giant hogweed and Japanese knotweed recorded south of River Tame

Field Surveys

13.5.34 A UK Habitat Classification ('UKHab') and habitat condition assessment survey was undertaken in June and September 2024 to characterise existing habitats, identify potential for protected and notable species on-site and to inform the baseline BNG habitat assessment. The Part 1a EIA Scoping Boundary includes the existing Minworth WwRC to the north-west and Curdworth Beds to the south-east.

- 13.5.35 Habitats within the existing Minworth WwRC include modified grassland, standing water which are part of the treatment works (e.g. sludge tanks), broad-leaved plantation woodland, hard standing and bare ground, open mosaic habitat on previously developed land, two ponds and an enhanced area of neutral grassland with scrub boundary.
- 13.5.36 Curdworth Beds is dominated by neutral grassland with areas of dense and continuous willow scrub, some of which is infrequently managed for access. Broad leaved plantation woodland is present around the east and northern perimeter of Curdworth Beds and adjacent to the Minworth WwRC. Three ponds are located adjacent to the Part 1a EIA Scoping Boundary to the north-east and south-east of Curdworth Beds. It is noted that the field survey did not identify floodplain grazing marsh within the Part 1a EIA Scoping Boundary, as noted through the desk study.
- 13.5.37 The grassland, scrub and woodland habitats which dominate the Part 1a EIA Scoping Boundary, identified during the field surveys, are suitable to support all species and species groups listed above.
- 13.5.38 The landscape is well connected by the River Tame riparian corridor to the south, the Birmingham and Fazeley Canal to the north and pockets of grassland, scrub and woodland surrounding the Part 1a EIA Scoping Boundary, but the latter is not connected with the Proposed Development.
- 13.5.39 Further ecological surveys are due to be carried out to inform the EIA baseline assessment, as set out within Section 13.7 of this chapter.

Part 1b: Minworth to Atherstone Pipeline

Desk Study

- 13.5.40 There are four statutory designated sites of nature conservation importance within 2 km of Part 1b Minworth to Atherstone Pipeline; these include Whitacre Heath SSSI, Kingsbury Wood SSSI, Kingsbury Meadow LNR and Bentley Park Wood SSSI.
- 13.5.41 Part 1b EIA Scoping Boundary is immediately adjacent to the Whitacre Heath SSSI boundary within the flood plain of the River Tame, which is noted for its wetland breeding birds. Part 1b EIA Scoping Boundary is also immediately adjacent to the Bentley Park Wood SSSI boundary, which is designated as a large and important ancient woodland. As well as its noteworthy botanical species, the wood supports a sizeable bird community and of the three localities in the county for breeding black redstart.
- 13.5.42 There are 50 non-statutory designated sites of nature conservation importance within 2 km of the Part 1b EIA Scoping Boundary, as set out within **Appendix 13-1** within Volume 3 of this EIA Scoping Report, including several listed in the study area for Part 1a above. Twelve LWSs are located within 200 m of the Part 1b EIA Scoping Boundary, many of which connect with the Tame Valley SINC / River Tame LWS which connects to the EIA Scoping Boundary; as discussed above for Part 1a.
- 13.5.43 The Part 1b EIA Scoping Boundary passes through the southern extent of both Lea Marston Lake LWS and Merevale Lake Woodlands LWS. Dunton Wood LWS is located immediately adjacent to the EIA Scoping Boundary and Drybrooks Wood LWS, Bentley Common LWS, Lea Marston Old Quarry,

Wards Hill LWS and Rawn Hill are located within 200 m of the EIA Scoping Boundary. The EIA Scoping Boundary also passes between the Bogs LWS and Flanders Hall Woodland LWS, potentially severing connectivity between these two LWS during construction.

- 13.5.44 There are six SINC or SLINC within the Part 1b study area. All are located over 1 km from the Part 1b EIA Scoping Boundary, the exception being Minworth Sewage Works SINC / SLINC which is circa 660 m to the west; as discussed above for Part 1a.
- 13.5.45 There are seven ancient woodlands within the Part 1b Minworth to Atherstone Pipeline study area. Gallops Hill Wood ancient woodland is located to the north of Colehill Road. The southern extent of the woodland is immediately adjacent to the Part 1b EIA Scoping Boundary. The woodland includes both ancient replanted woodland and ancient and semi-natural woodland (two separate ancient woodland units); the latter is also part of the Merevale Lake Woodlands LWS.
- 13.5.46 Bentley Park Wood ARW, Dunton Coppice, Gallops Hill Wood ASNW, Gallops Hill Wood ARW and Holly Thicks ancient woodlands are all immediately adjacent to the Part 1b EIA Scoping Boundary. The other two ancient woodlands are between 24 m and 92 m from the Part 1b EIA Scoping Boundary.
- 13.5.47 **Table 13-9** summarises records of protected and notable species for the Part 1b study area identified through the desk-study.

Table 13-9: Desk study: Protected and Notable Species within 2 km of Part 1b EIA Scoping Boundary

Species / Group	Record Description
Amphibians	Common toad, common frog, palmate newt, smooth newt and GCN
Badger	Records not provided by LERC
Birds	Barn owl, fieldfare, green sandpiper, grey partridge, hobby, kingfisher (all Schedule 1 W&C Act species) and other notable species all recorded at Minworth Sewage Works LWS Brambling, redwing and fieldfare (all Schedule 1 W&C Act species) Lesser redpoll, skylark, swift, hawfinch, mistle thrush, cuckoo, house martin, yellowhammer, house Sparrow, starling (all Red list of birds of conservation status (Ref. 45))
Bats	Brown long-eared bat, common pipistrelle, Daubenton's bat, noctule bat, soprano pipistrelle, a record of Nathusius's Pipistrelle and Brandt's bat
Reptile	Grass snake at White Acre Heath. Grass snake and common lizard at Baddesley Common
Otter	Recorded at Kingsbury and Ladywalk LWS
Water vole	Recorded on the Birmingham and Fazeley Canal and Grand Union Canal
Other mammal	Hedgehog recorded at settlements only including Whitacre Heath, Marston, Kingsbury, Hurley, Baddesley Ensor and Atherstone

Species / Group	Record Description
	Brown hare recorded at Kingsbury Water Park Polecat recorded at Purley and Mancetter Quarries
Terrestrial invertebrates	Over 900 records predominantly butterflies and moths Records concentrated at Purley and Mancetter Quarries LWS, Baddesley Common, Lea Maston Lake and Hams Hall Woodlands
Plants	Corn spurrey, wild strawberry, white mustard, wood horsetail, heath speedwell, small pondweed, lesser spearwort, wood-sorrel, rye brome, giant butterbur and common cudweed
Invasive non-native plants	Giant hogweed, New Zealand pigmy weed, Japanese knotweed, water fern, rhododendron, Himalayan cotoneaster, wall cotoneaster, Nuttall's waterweed, montbretia, Japanese rose, Virginia-creeper, parrot's-feather and yellow archangel

Field Surveys

13.5.48 A UKHab and habitat condition assessment survey was undertaken in June and September 2024. The EIA Scoping Boundary includes predominantly arable land with hedgerows and areas of modified grassland used for farming. Other habitat types within the EIA Scoping Boundary include:

- a. Broad-leaved woodland and neutral grassland at Atherstone golf course;
- b. Broad-leaved woodland at Merevale Woods; and
- c. Broad-leaved trees, neutral grassland and riparian habitat adjacent to River Tame at Lea Marston.

13.5.49 The habitats which dominate the Part 1b EIA Scoping Boundary, identified during the field surveys are suitable to support all species and species groups listed above.

13.5.50 The landscape is well connected by the River Tame and Lea Marston Lakes to west, and extensive areas of woodland at Merevale Park and Baddesley Ensor in the east and pockets of grassland, scrub and woodland surrounding the Part 1b EIA Scoping Boundary.

13.5.51 Further ecological surveys are due to be carried out to inform the EIA baseline assessment, as set out within Section 13.7 of this chapter.

Part 2: Outfall and Works to the Coventry, Oxford and Grand Union Canals

Desk study

13.5.52 It is important to note that the distances for important ecological features have been taken from the Indicative Work Area of the Part 2 EIA Scoping Boundary only, and not the Indicative Non-Work Area of the Part 2 EIA Scoping Boundary, as shown on **Figures 13-1 to 13-4** within Volume 2 and detailed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report.

13.5.53 There are 21 statutory designated sites of nature conservation importance within the study area; these include one SAC, namely the Ensor's Pools

SAC / SSSI, 11 SSSIs, one NNR (King's Wood and Rushmere), and eight LNR sites. In addition, the Combe Pool SSSI located 2.7 km from the Part 2 EIA Scoping Boundary (Indicative Work Area) has been identified to be potentially hydrologically connected to the Part 2 EIA Scoping Boundary (Indicative Work Area) within **Chapter 22: Water Environment and Flood Risk** of this EIA Scoping Report.

- 13.5.54 Ensor's Pool SAC / SSSI is located 1 km west of the Part 2 EIA Scoping Boundary (Indicative Work Area) and lies on the western edge of Nuneaton. It includes an area of an abandoned clay pit. Ensor's Pool has been designated for its national importance as one of the best lake population for white-clawed crayfish in England. The grassland located adjacent to the standing waterbody is also noted for its botanical species. As set out in **Chapter 12: Ecology – Aquatic** of this EIA Scoping Report, Ensor's Pool SAC / SSSI is not hydrologically connected to the Proposed Development, and as such, it is scoped out of further assessment.
- 13.5.55 Bugbrooke Meadows SSSI is located 718 m to the north-east, adjacent to the River Nene and Hoarestone Brook which flows through a culvert under the Grand Union Canal south of Bugbrooke. Blisworth Rectory Farm Quarry, Illing's Trenches, Woodlands Quarry and Boon's Quarry SSSIs are all former quarries designated for their geological interest and are located within 1 km from the Part 2 EIA Scoping Boundary (Indicative Work Area). All other SSSIs are located over 1 km from the Part 2 EIA Scoping Boundary (Indicative Work Area).
- 13.5.56 King's Wood and Rushmere NNR is an ancient woodland located in Bedfordshire. The woodland supports a notable community of plants and an array of interesting birds, such as nuthatches and treecreepers and notable invertebrates, including white admiral and silver-washed fritillary butterflies.
- 13.5.57 Two LNRs are located within or immediately adjacent to the Part 2 EIA Scoping Boundary (Indicative Work Area). Daventry Country Park LNR includes the Daventry Reservoir and Wyken Slough LNR is located adjacent to the Part 2 EIA Scoping Boundary (Indicative Work Area) in Coventry.
- 13.5.58 Linnell Road LNR, is located 0.27 m from the Part 2 EIA Scoping Boundary in Rugby. Clifton Brook, located adjacent to Linnell Road LNR, passes below the canal then flows adjacent to the LNR.
- 13.5.59 There are 155 non-statutory designated sites of nature conservation importance within 2 km of the Part 2 EIA Scoping Boundary (Indicative Work Area). These include 141 LWSs and 14 CWSs.
- 13.5.60 A total of 34 non-statutory designated sites of nature conservation importance are located within 200 m of the Part 2 EIA Scoping Boundary (Indicative Work Area). Of these, 19 are located wholly or partly within or immediately adjacent to the Part 2 EIA Scoping Boundary (Indicative Work Area) and 15 are located within 200 m of the Part 2 EIA Scoping Boundary (Indicative Work Area), see **Table 13-10**. In addition, a section of Part 2 near Daventry crosses the Nene Valley NIA.

Table 13-10: Non-statutory designated sites of nature conservation importance within 200 m of the Part 2 EIA Scoping Boundary (Indicative Work Area)

Location	Non-statutory Designated Sites for Nature Conservation
Within or adjacent to the Part 2 EIA Scoping Boundary (Indicative Work Area)	All Oaks Wood LWS; Allans Meadows LWS; Boons Wharf LWS; Coventry B Supergrid LWS; Grand Union Canal Bugbrooke LWS; Grand Union Canal – Northampton Arm LWS; Hartshill Lagoons LWS; Hawkesbury Spinney and Old Tip LWS; Judkins Quarry LWS; Hillmorton Canal Meadows LWS; Oxford Canal LWS; Ouzel Valley CWS; Rawn Hill LWS; River Avon and Tributaries; River Ouzel CWS; Stoke Bruerne Brickpits LWS; Weedon A5 Field LWS; White Hall Farm East Pasture LWS; and Wyken Slough LWS.
Within 200 m of the Part 2 EIA Scoping Boundary (Indicative Work Area)	Hillmorton Ballast Pit LWS; Hillmorton Marsh LWS; Home Farm Grasslands LWS; Hopsford Hall Pastures LWS; Jeas Quarry LWS; Lentons Lane Swamp LWS; Lentons Lane Tip LWS; Longfield LWS; Quarry Farm Lane LWS; Swinnet Copse and Meadow LWS; Thrupp Covert LWS; Tiddenfoot Park CWS; Weedon Depot Canal LWS; Windmill Hill LNR / LWS; and Woodlands Quarry LWS.

13.5.61 There are 203 pLWS within the Part 2 study area. Of these, 36 pLWS are located wholly or partly within the Part 2 EIA Scoping Boundary (Indicative Work Area). A further 24 pLWS are located within 200 m of the Part 2 EIA Scoping Boundary (Indicative Work Area).

13.5.62 There are six ancient woodlands within the Part 2 study area. Purley Park Ancient & Semi-Natural Woodland is located to the south-west of Atherstone and west of Coventry Canal within approximately 125 m. The ancient and semi-natural woodland forms part of a network of woodland habitats and is located between Purley Park LWS and Rawn Hill LWS; the latter is also an

ancient woodland located within 10 m of the Part 2 EIA Scoping Boundary (Indicative Work Area).

13.5.63 An unnamed ancient woodland, located over a 150 m from the canal network, is connected via Spring Wood west of Hartshill.

13.5.64 All Oaks Wood ancient woodland is located to the south of Cathiron Lane within approximately 10 m and not hydrologically connected to the Part 2 canal network.

13.5.65 **Table 13-11** summarises records of protected and notable species within the canal network study area obtained through a desk-study.

Table 13-11: Desk study: Protected and Notable Species within 2 km of the Part 2 EIA Scoping Boundary (Indicative Work Area)

Species / Group	Record Description
Amphibians	Common toad, common frog, smooth newt and GCN
Badger	Abundance of records, most are located away from the canal in areas of suitable habitats including woodland, hedges and arable margins
Birds	Barn owl, bittern, black redstart, brambling, Cetti's warbler, crossbill, fieldfare, greylag goose, hobby, kingfisher, marsh harrier, osprey, peregrine falcon, ruff, red kite, redwing are all Schedule 1 W&C Act species Other birds on the red and amber list of birds of conservation status are also present in the study area (Ref. 45)
Bats	Brown long-eared bat, common pipistrelle, Daubenton's bat, noctule bat, soprano pipistrelle, serotine, Myotis sp., Nathusius's Pipistrelle, a record of whiskered bat near Hinckley and three records for western barbastelle near Milton Keynes
Reptile	Grass snake records along the canal network at Rugby and Hartshill. Common lizard has been recorded between Hartshill and Bedworth. Slow worm recorded in abundance at Hartshill Most slow worm and common lizard records are over 500 m from the canal
Otter	Over 50 records, most associated with the canal network Most records at Rugby and between Milton Keynes and Leighton Buzzard
Water vole	Over 50 records, almost all of which are located along the canal network between Atherstone and Coventry
Other mammal	An abundance of hedgehog records at settlements and roads. Records also near to the canal network Brown hare, 20 records all over 1 km from the canal network and predominantly in habitat associated with arable land Polecat, 10 records all associated with roads and over 1 km from the canal; exception being a record at Rawn Hill near Atherstone
Terrestrial invertebrates	Over 5000 records within the study area predominantly butterflies and moths

Species / Group	Record Description
	Most records are associated with LWSs
Plants	Over 400 records within the study area, including those on the UK Red list (Ref. 53) such as corn chamomile, quaking grass, box, hound's tongue, wild strawberry, tubular water-dropwort, tormentil, lesser spearwort, ragged robin, devil's bit scabious, marsh valerian and marsh speedwell
Invasive non-native plants	Over 200 records most of which are located between Milton Keynes to Leighton Buzzard and Atherstone to Rugby. Species include Canadian waterweed, entire-leaved cotoneaster, giant hogweed, giant rhubarb, Himalayan cotoneaster, Himalayan / Indian balsalm, Japanese knotweed, Japanese rose, montbretia, New Zealand pigmyweed, Nuttall's waterweed, orange balsalm, parrot's-feather, rhododendron, Virginia-creeper, wall cotoneaster, water fern, yellow archangel

13.5.66 The terrestrial habitats which dominate the Part 2 EIA Scoping Boundary (Indicative Work Area), identified during the field surveys (refer to sections below), are suitable to support all species and species groups listed above.

13.5.67 The landscape is well connected by the network of rivers which cross and connect with the canal and the extensive areas of woodland, lakes, pockets of grassland, scrub and woodland that are located adjacent to the canal network wildlife corridor.

Field Surveys

13.5.68 An initial UKHab and habitat condition assessment survey was undertaken between August and October 2024 for Part 2 EIA Scoping Boundary (Indicative Work Area). The Part 2 EIA Scoping Boundary (Indicative Work Area) includes predominantly running water (canals), broad-leaved semi natural and plantation woodland, scrub, neutral grassland and modified grassland.

13.5.69 Habitats will be detailed further in the ES, and supported by a Preliminary Ecological Appraisal (PEA) Report for the canal network using information collected in 2024 (described above) and subsequent habitat surveys in 2025.

13.5.70 The habitat assessment along the canal network in 2023 recorded that the riparian habitat within the canal network provides good habitat for water voles. Targeted water vole surveys in 2023 and 2024 have identified water vole burrow and evidence of activity along the canal network. The water vole survey reports will be provided with the ES.

13.5.71 Presence of water vole was recorded in abundance between Atherstone and Coventry. Between Coventry and Blisworth water vole burrows and evidence of activity was good along the canal network. South of Blisworth tunnel and to Leighton Buzzard, the presence of water vole burrows and evidence of water vole activity was poor. During the survey, the presence of mink and otter was also recorded along the canal network.

13.5.72 Daytime bat assessment of five bridges with bat roost potential and subsequent nocturnal bat roost surveys were carried out in 2023. Surveys

were carried out at Coventry Cruiser Club access bridge, Bridge 5 footbridge, Bridge 26 Grimes Bridge, Bridge 43 Tuckey's Bridge and Whilton Marina footbridge. A summer day roost by a common pipistrelle bat was identified at Tuckey's Bridge.

- 13.5.73 Bat hibernation roost monitoring surveys were carried out at two bridges: Turkey's bridge (Bridge 43) located east of Cathiron and the Coventry Cruising Club footbridge bridge located north of Coventry which had been identified with features suitable to support hibernating bats. Hibernating bats could not be ruled out at these two bridges. The bat survey reports will be provided with the ES.
- 13.5.74 Non-native invasive species assessment along the canal network is discussed in **Chapter 12: Ecology – Aquatic** of this EIA Scoping Report.

Part 3: Daventry and Drayton Reservoirs

Desk study

- 13.5.75 Daventry Reservoir within the Part 3 EIA Scoping Boundary is designated as the Daventry Country Park LNR / LWS.
- 13.5.76 In addition, the Upper Nene Valley Gravel Pits SPA / Ramsar, designated for its importance to wintering birds, is located 7.05 km to the east of the Part 3 EIA Scoping Boundary, near Northampton. **Chapter 12: Ecology – Aquatic** of this EIA Scoping Report identifies a potential impact pathway during construction and operation on water quality due to the works to Drayton and Daventry Reservoirs, which are upstream in the headwaters of the River Nene catchment. As such, the Upper Nene Valley Gravel Pits SPA / Ramsar has been scoped in for further assessment.
- 13.5.77 A total of seven non-statutory designated sites of nature conservation importance are located within 2 km of the Part 3 EIA Scoping Boundary. Borough Hill Field LWS, and Swinell Copse and Meadows LWS are all located over 200 m away from the Part 3 EIA Scoping Boundary and are not hydrologically connected with the Daventry and Drayton Reservoirs. Thrupp Covert LWS is located 124 m from the Part 3 EIA Scoping Boundary, it is not hydrologically connected to the Drayton and Daventry Reservoirs but has habitat connectivity through terrestrial habitats. Whilst both Bragborough Meadows LWS and Bragborough Hole LWS, located over 1 km north of the Drayton and Daventry Reservoirs, are hydrologically connected to the GUC through a culvert beneath Dark Lane, the ditch network adjacent to these LWSs flows south into the GUC.
- 13.5.78 There are 34 pLWS within the Part 3 study area. Of these, 8 pLWS are located wholly or partly within the Part 3 EIA Scoping Boundary. A further three pLWS are located within 200 m of the Part 3 EIA Scoping Boundary.
- 13.5.79 There are no areas of ancient woodland within the Part 3 study area. The following priority habitat types were identified within the Part 3 study area: deciduous woodland, coastal and floodplain grazing marsh, good quality semi-improved grassland, lowland fens, traditional orchard, additional habitats present (no main habitat).
- 13.5.80 **Table 13-12** summarises records of protected and notable species within the Part 3 study area obtained through a desk-study.

Table 13-12: Desk study: Protected and Notable Species within 2 km of the Part 3 EIA Scoping Boundary

Species / Group	Record Description
Amphibians	Common toad, common frog, smooth newt and GCN
Badger	Two records near Braunston
Birds	Over 5000 bird records including Schedule 1 W&C Act species: barn owl, black neck grebe, black redstart black-tailed godwit, black tern brambling, Cetti's warbler common scoter, crossbill, fieldfare, firecrest, garganey, goldeneye, greenshank, green sandpiper, greylag goose, hen harrier, honey buzzard, hobby, kingfisher, little gull, little ringed plover, marsh harrier, Mediterranean gull, merlin, osprey, peregrine falcon, pintail, quail, ruff, red kite, redwing, Slavonian grebe, scaup, snow bunting, tundra swan, whimbrel, whooper swan and woodlark. Other birds on the red and amber list of birds of conservation status are also present in the Study Area (Ref. 45)
Bats	Brown long-eared bat, common pipistrelle, Daubenton's bat, noctule bat
Reptile	Grass snake records have been recorded adjacent to the Grand Union Canal, circa 900 m north of Daventry Reservoir and 1.5 km south-west of Braunston in 2007
Otter	Five records, two of which area at Drayton Reservoir
Water vole	None
Other mammal	Eleven records of hedgehog record at Daventry and one at Welton
Terrestrial invertebrates	Over 5000 records within the study area predominantly butterflies and moths. Most records are associated with the LWSs
Plants	Five records within the study area, notable and locally scarce species including: stinking hellebore, bluebell, mudwort, ivy crowfoot
Invasive non-native plants	One record for Japanese rose located next to Drayton Reservoir

13.5.81 The habitats which dominate the Part 3 EIA Scoping Boundary, identified through field surveys, as set out below, are suitable to support all species and species groups listed above.

13.5.82 The canal network in the north and disused railway corridor in the south of the Part 3 EIA Scoping Boundary are connected through both reservoirs and the rural landscape around Daventry.

Habitat and GCN field surveys

13.5.83 A PEA survey was undertaken around the reservoirs in 2023 to inform future baseline surveys. The Part 3 EIA Scoping Boundary includes predominantly standing water (reservoirs), broad-leaved semi natural woodland and modified grassland.

- 13.5.84 One EPS mitigation licence for GCN had previously been granted by Natural England within the study area, located 50 m south of the Part 3 EIA Scoping Boundary near Little Braunston. A GCN class survey licence with a record of GCN presence recorded in 2016 was returned for grid reference SP577633 and is within the Part 3 EIA Scoping Boundary at Daventry Reservoir.
- 13.5.85 During the PEA in 2023, 16 standing waterbodies were identified within 250 m of the Part 3 EIA Scoping Boundary (including the two reservoirs). All 16 waterbodies were assessed for their suitability to support GCN through a habitat suitability index (HSI) assessment (Ref. 48). Water samples were collected and then tested for GCN eDNA (Ref. 47) at six waterbodies. The presence of GCN was confirmed through the eDNA survey in 2023 at one waterbody, Pond 4, which is the same location as the class survey licence record discussed above.
- 13.5.86 Summary of the GCN habitat assessment and eDNA results are provided in **Table 13-13** for the waterbodies identified on **Figure 13-5** within Volume 2 of this EIA Scoping Report. Further information is also provided within **Appendix 13-1** within Volume 3 of this EIA Scoping Report.
- 13.5.87 GCN survey reports for Part 3 EIA Scoping Boundary will be provided with the ES.

Table 13-13: Summary of GCN habitat assessment and eDNA results – 250 m of Daventry and Drayton Reservoirs

Waterbody	HSI Score	eDNA Survey Result
Drayton Reservoir	0.33 / Poor	Negative
Daventry Reservoir	0.31 / Poor	Negative
Pond 3	0.85 / Excellent	Negative
Pond 4	0.92 / Excellent	Positive
Pond 5	0.74 / Good	Negative
Pond 11	0.57 / Poor	Negative
Pond 12	0.58 / Below average	Negative

Water vole and otter surveys

- 13.5.88 A water vole and otter presence / absence survey and habitat assessment was undertaken in August 2023 at the Daventry and Drayton Reservoirs. Water samples were collected from Daventry, Drayton and a control site (on the Oxford Canal) was tested for water vole and otter eDNA in November 2023.
- 13.5.89 The reservoirs were considered suitable for water vole, otter and mink; however, no evidence for these species was identified during the survey. Terrestrial habitat and waterbodies that connect with the reservoirs were also assessed to be suitable to support water vole, otter and mink. Detailed surveys of these areas were not carried out at the time.
- 13.5.90 A negative result for water vole and otter eDNA was returned for either species at both, Daventry and Drayton Reservoirs. The control eDNA was positive for both otter and water vole. Therefore, at that point in time, water vole and otter were assessed to be absent from the two reservoirs. However,

it was noted that desk study records of otter indicate that they are present at one or both reservoirs sporadically.

13.5.91 Water vole and otter survey reports for Part 3 will be provided with the ES.

Part 4a: Abstraction, Storage and Treatment

Desk Study

13.5.92 Both Site B and Site H options have been considered as part of the baseline assessment for Part 4a of the Proposed Development.

13.5.93 There are no statutory designated sites of nature conservation importance within 2 km of Part 4a. However, Site H's EIA Scoping Boundary is located within the Ivinghoe Hills and Totterhoe Stone Pit and Knolls SSSI Risk Zone.

13.5.94 There are ten non statutory designated sites of nature conservation importance within the study area of Site B and two within the study area for Site H, as listed within **Appendix 13-1** within Volume 3 of this EIA Scoping Report.

13.5.95 Waterhall Park LWS is located 26 m north of the Site B EIA Scoping Boundary beyond the A4140. The LWS forms the southern extent of the historical park located between the GUC and River Ouzel. All other LWSs are over 500 m from Site B and are not hydrologically connected to Site B.

13.5.96 Green Lane, Slapton LWS, which comprises a double species rich hedge located on either side of a footpath, transverses east to west through the centre of Site H. The River Ouzel CWS is located over 500 m away and does not appear to be hydrologically connected with Site H.

13.5.97 The Greensand Ridge NIA is located within the Site B EIA Scoping Boundary.

13.5.98 A UKHab and habitat condition assessment survey was undertaken in October 2024 to characterise existing habitats, identify potential for protected and notable species on-site and to inform the baseline BNG habitat assessment at Site H. Habitats within Site H include arable land, broad-leaved plantation woodland, semi-improved and neutral grassland and the two species rich hedgerows along the Green Lane.

13.5.99 No ancient woodlands were identified within Site B or Site H EIA Scoping Boundary or the study area.

13.5.100 **Table 13-14** summarises the records of protected and notable species identified through the desk study.

Table 13-14: Desk study: Protected and Notable Species within 2 km of Part 4a EIA Scoping Boundary

Species / Group	Record Description Site B	Record Description Site H
Amphibians	Common toads, common frogs, smooth newts and great crested at Waterhall Park,	Historical (1996) record of common frog recorded on the site hedge

Species / Group	Record Description Site B	Record Description Site H
	nearest record GCN record within 50 m of site	Common toads, common frogs, smooth newts and GCN beyond 500 m from site
Badger	Presence recorded within 500 m	Presence recorded within 500 m
Birds	Reed bunting, mute swan, snipe recorded on-site Recent barn owl record and historical record of yellow-browed warbler on immediately adjacent land	Good range of birds, including farmland birds recorded along the canal and at Slapton, including barn owl, lapwing, skylark, yellow hammer, curlew, reed bunting.
Bats	Pipistrelle bat box at Waterhall Park. Noctule, Soprano pipistrelle, Daubenton's, Natterers, Brown long-eared, Leisler	Pipistrelle recorded (2014) adjacent to the canal Other pipistrelle, Daubenton's and Noctule recorded at Slapton and along the canal
Reptiles	No records returned	No records returned
Otter	No records returned	No records returned
Water vole	No records returned	No records returned
Other Mammals	Hedgehog	Hedgehog and brown hare
Terrestrial Invertebrates	Mostly historical records (>20year old) only Essex Skipper, Wall, small heath recorded at Waterhall Park	No records returned
Aquatic invertebrates	N/A	Large-mouthed valve snail- (freshwater) River Ouzel 1km north of site
Plants	Devils – Bit Scabious record from GUC adjacent to the Site Other plants recorded beyond 500 m away: bluebell, greater dodder and cornflower, ragged robin, quaking-grass	Wild Celery, Field Scabious and cross wort all recorded over 50 m from the site
Invasive Non-native Plants	Orange Balsam and Japanese Knotweed recorded away from the site	Orange Balsam west along canal

13.5.101 The grassland, hedgerows, arable land and woodland habitats within the EIA Scoping Boundary, identified during the field surveys and desk study, are suitable to support all species and species groups listed above.

13.5.102 The landscape is well connected by the GUC and River Ouzel which run parallel and adjacent to the Part 4a sites.

- 13.5.103 Further ecological surveys are due to be carried out between 2025-2026 to inform the EIA baseline assessment, as set out within Section 13.7 of this chapter.

Part 4b: Pipeline to Underground Reservoir Near Luton

Desk Study

- 13.5.104 Within this section, the baseline for pipeline route options included within Part 4b of the Proposed Development has been described as a whole. A breakdown of the baseline information by route option is provided within **Appendix 13-1** within Volume 3 of this EIA Scoping Report.
- 13.5.105 The following statutory designated sites of nature conservation importance are within the study area of Part 4b route options: Chilterns Beechwood SAC / SSSI, twelve SSSIs including one SSSI/LNR (Totternhoe Knolls), one NNR (King's Wood and Rushmere) and two LNRs.
- 13.5.106 Chilterns Beechwoods SAC / SSSI is located circa 3 km south of the Part 4b EIA Scoping Boundary within the Chilterns National Landscape and noted for its extensive track of *Asperulo-Fagetum* beech forest. The woodland is an important part of a grassland-scrub-woodland mosaic. A distinctive feature in the woodland flora is the occurrence of Coral Root *Cardamine bulbifera*, a rare perennial flower, and an important orchid site. Stag beetle *Lucanus cervus* is a secondary qualifying feature for the site.
- 13.5.107 Of the twelve SSSIs located within the Part 4b study area, the Dunstable and Whipsnade Downs SSSI and Kings and Bakers Wood and Heaths SSSI are partially located within the Part 4b EIA Scoping Boundary. A further two SSSIs, Dallow Downs and Winsdon Hill SSSI and Kensworth Chalk Pit SSSI are located within 200 m to the south of the Part 4b EIA Scoping Boundary.
- 13.5.108 Dunstable and Whipsnade Downs SSSI is designated as a large area of open chalk hills (downland) and Dallow Downs and Winsdon Hill SSSI is designated for its unimproved and semi-improved calcareous and neutral grasslands with ancient woodland. Both also have management for mixed scrub.
- 13.5.109 Kings and Bakers Wood and Heaths SSSI is the largest woodland in Bedfordshire supporting priority habitats including lowland heath and acidic grassland habitats. Kensworth Chalk Pit SSSI is designated for its geological interest.
- 13.5.110 There are 64 non-statutory designated sites of nature conservation importance (LWS and CWS) within the 2 km study area for Part 4b, including several listed in the study area for Part 2 above. The following 26 LWS / CWS are located within 200 m of the Part 4b EIA Scoping Boundary, of which 13 LWS / CWS are located wholly or partly within the Part 4b EIA Scoping Boundary:
- a. SP2 Route Option: Fox and Hounds Quarry CWS, designated for its neutral grassland and Wood Vetch (rare vascular plant) is located wholly within the EIA Scoping boundary. Approximately half of Eggington Fields CWS is located within the Part 4b EIA Scoping Boundary. Double Arches Pit CWS and Battlesden Lake CWS are

located adjacent to the A5 and partially overlap the EIA Scoping boundary. Clipstone Brook CWS crosses east – west the proposed pipeline and King's and Baker's Woods and Heaths CWS abuts the western edge of the EIA Scoping boundary. Great Brickhill LWS is located wholly within the Part 4b EIA Scoping Boundary of SP2A Route Option. Adjacent to this LWS are Canon Hill LWS and The Moor & Great Firs which are partially located within the Part 4b EIA Scoping Boundary.

- b. SP5 Route Option: Green Lane, Slapton LWS is located within the Site H (discussed above) and River Ouzel CWS crosses the proposed pipeline route north-south.
- c. SP10 Route Option: Badgerdell Wood CWS, designated as an ancient woodland is located at the western end of the EIA Scoping Boundary. Dunstable and Whipsnade Downs CWS, designated for its calcareous grassland, neutral grassland and scrub, stretches south from Dunstable to Whipsnade. The Part 4b EIA Scoping Boundary passes through the CWS, potentially severing connectivity through the CWS during construction.

13.5.111 No data was provided by LERCs for any potential or candidate CWS or LWS within the study area for Part 4b.

13.5.112 There are nine ancient woodlands within the Part 4b 200 m study area. At Part 4b SP2 Route Option, Bushycommon Wood is located 100 m to the north and Bragenham Wood and Duncombe Wood are located adjacent immediately south of the EIA Scoping Boundary. Duncombe Wood and Bushycommon Wood support both ancient semi natural (ASNW) and ancient replanted (ARW). These three ancient woodlands are also designated as CWSs.

13.5.113 At Part 4b Route Option SP10, Badgerdell Wood ASNW, Bush Wood ASNW, Sloug Wood ASNW ancient woodlands are all located within the EIA Scoping Boundary. Sallowspring Wood ASNW, Castlecroft ASNW and Little John's Wood ASNW ancient woodland are between 30 m and 185 m from the Part 4b EIA Scoping Boundary.

13.5.114 A UKHab and habitat condition assessment survey is scheduled to be undertaken in 2025-2026. The Part 4b EIA Scoping Boundary includes predominantly arable land with hedgerows and areas of modified grassland used for farming. Other habitat types within the Part 4b EIA Scoping Boundary include:

- a. Unimproved grassland, broad-leaved woodland and scrub at Dunstable and Whipsnade Downs;
- b. Line of trees, calcareous / neutral grassland and ponds along the River Ouzel;
- c. Broad-leaved plantation woodland along the A505, A4012 Leighton Road and A5;
- d. Across and parallel to watercourses including Whistle Brook, River Ouzel, Ouzel Brook, Clipstone Brook;
- e. Series of water bodies between Mill Road and A4012 Leighton Road;

- f. Neutral grassland at Fox and Hounds Quarry CWS; and
- g. Wet flushes, pond, woodland and scrub at Canon Hill CWS and Great Brickhill grassland CWS.

13.5.115 **Table 13-15** summarises records of protected and notable species for the Part 4b study area identified through the desk-study.

Table 13-15: Desk study: Protected and Notable Species within 2 km of Part 4b EIA Scoping Boundary

Species / Group	Record Description
Amphibians	Common toad, common frog, palmate newt, smooth newt, palmate newt and GCN
Badger	Records throughout study area, in particular in hilly and woodland areas
Birds	Abundance of farmland birds including skylark corn bunting and lapwing. Curlew recorded near Slapton Barn owl and kingfisher (Schedule 1 Wildlife & Countryside Act species) are widespread along the river corridor and adjacent land Other less common species recorded include Cetti's Warbler, Marsh and Hen harrier, Dartford warbler, Nightjar, Bitten and Whooper Swan
Bats	Common Pipistrelle, Soprano Pipistrelle, Brown long-eared bat, Daubenton's bat, Noctule bat, Leisler's Bat Natterer's Bat Soprano pipistrelle, Nathusius's pipistrelle and Brandt's bat and Whiskered Bat recoded Barbastelle recorded occasional
Reptile	Grass snake, common lizard, slow-worm and adder
Otter	Recorded occasionally along the GUC and River Ouzel
Water vole	Recorded on one occasion along the River Ouzel, historical records present (>30-year-old)
Other mammal	Hedgehog frequently recorded in towns and villages Brown hare recorded in arable land and grassland/woodland including Slapton and Little Brickhill copse Harvest mouse infrequently, recorded at great Brickhill Polecat recorded in the Chilterns National Landscape
Terrestrial invertebrates	Over 180 different species of invertebrates predominantly butterflies and moths, occasional true flies (mostly bees) and beetles Including Stag Beetle, Small blue, White admiral, White-letter hairstreak, Purple Emperor, Adonis blue, Chalk hill blue, Duke of Burgundy (Schedule 5 Wildlife & Countryside Act species)
Plants	Over 90 different species of flowering plants, two ferns and two fungus records Most area affiliated with designated sites or from along the GUC and River Ouzel

Species / Group	Record Description
Invasive non-native plants	American mink recorded along the GUC, River Ouzel and at road north of Great Brickhill Widespread records include Giant hogweed, New Zealand pigmy weed, Japanese knotweed, Himalayan cotoneaster, wall cotoneaster, Montbretia, Canadian and Nuttall's waterweed, Curly Waterweed, Japanese rose, Virginia-creeper, parrot's-feather, American Skunk-cabbage and yellow archangel

13.5.116 The habitats which dominate the Part 4b EIA Scoping Boundary, identified during the desk study are suitable to support all species and species groups listed above.

13.5.117 The landscape is well connected by the River Ouzel and GUC and Lea, and extensive areas of woodland including ancient woodland with pockets of grassland and scrub surround the EIA Scoping Boundary.

13.5.118 Further ecological surveys are due to be carried out between 2025-2026 to inform the EIA baseline assessment, as set out within Section 13.7 of this chapter.

Future Baseline

13.5.119 The EIA will consider future baseline conditions within the study area for the construction period, as well as during the anticipated full build out year (currently assumed as 2032). In the short- to medium-term, in the absence of the Proposed Development, habitats within the EIA Scoping Boundary have and will continue to provide a number of species with potential habitat for foraging and reproduction.

13.5.120 The future baseline will also consider habitat improvement schemes which are under way, including (but not limited to) habitat creation works for water voles at Hawkesbury Junction and Ansty that are being undertaken by the Environment Agency and habitat enhancements for breeding birds that are being undertaken by the West Midlands Ringing Group.

13.5.121 Nevertheless, it is considered that the overall species abundance and diversity are likely to remain similar to the existing baseline conditions during the construction period and by the start of operation, although the trajectory for many species is likely to be continued decline. The majority of existing habitats are likely to continue being present, although some changes in habitat extent, composition and structure will occur as a result of ecological succession, e.g. the gradual establishment of tree and shrub seedlings within woodland areas and along hedgerows. These resultant gradual changes in habitat composition are unlikely to materially alter the ecological baseline and therefore the habitats and species present are very unlikely to undergo significant change prior to the start of construction.

13.5.122 Based on current projections, the long-term will see an increased frequency of extreme weather conditions due to climate change (refer to **Chapter 10: Climate** of this EIA Scoping Report). There would be a continued decline in biodiversity, including species associated with the baseline conditions present within the EIA Scoping Boundary. Whilst there is likely to be an

overall decline in biodiversity, there are no reasons to expect that there would be any marked change in the broad habitat types within the EIA Scoping Boundary by the expected opening year in 2032.

13.6 Potential Effects

Construction Phase

- 13.6.1 A summary of the scoping of potential effects from the Proposed Development during the construction phase is provided within **Table 13-16**.
- 13.6.2 **Table 13-16** focusses on identifying potential impacts and important ecological features that require further assessment, and as such would need to be scoped in to the EIA. Where specific impacts or receptors are not referenced, these can be assumed to be scoped out.

Table 13-16: Potential effects during the construction phase – Terrestrial Ecology

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
<i>Statutory designated sites</i>				
Indirect impacts to statutory designated sites of international importance beyond 2 km of the Proposed Development, potentially hydrologically connected with the EIA Scoping Boundary of the Proposed Development	Upper Nene Valley SPA and Ramsar	In	Part 3	A potential impact pathway (and thus potential effect) during construction on water quality due to the works to Drayton and Daventry Reservoirs, which are upstream in the headwaters of the River Nene catchment, has been identified. As such, the Upper Nene Valley Gravel Pits SPA / Ramsar has been scoped in for further assessment.
	Ensor Pool's SAC / SSSI Chilterns Beechwood SAC / SSSI	Out	Part 2 Parts 2, 4a and 4b	Ensor Pool's SAC / SSSI and Chilterns Beechwood SAC / SSSI are not hydrologically connected to the EIA Scoping Boundary of the Proposed Development and as such, have been scoped out of further assessment.
Direct impacts to statutory designated sites from construction and temporary works, resulting in habitat degradation and loss	Wyken Slough LNR	In	Part 2	Three statutory designated sites are wholly or partially located within the EIA Scoping Boundary. The construction works may result in habitat degradation or loss at Wyken Slough LNR (due to a potential access track in Part 2), Cottage Bottom Fields LNR (due to
	Daventry Country Park LNR	In	Part 3	
	Cottage Bottom Fields LNR	In	Part 4b	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
				pipeline installation in Part 4b) and Daventry Country Park LNR (due to the new pipeline, inlet and outlet at the reservoir in Part 3). The construction works may result in habitat degradation or loss at the three LNRs, due to a potential pipeline construction works (including access track and material storage).
Temporary direct effects on statutory designated sites due to: - Airborne pollution within 200 m of the EIA Scoping Boundary - Run-off to these sites, due to their hydrological connection with the EIA Scoping Boundary - Compaction of tree root systems	Whitacre Heath SSSI, Bentley Park Wood SSSI	In	Part 1b	Construction activities may result in deposition of airborne pollutants from vehicle or plant emissions. Within 200 m (Ref. 51) of the Proposed Development there are 10 statutory designated sites In addition, construction activities may have an impact on hydrological pathways connected to designated sites through runoff pollutants or sediment. Where designated sites are located within or adjacent to the EIA Scoping Boundary, tree roots are at risk from damage and/or compaction, for example through use of a new access track by vehicles.
	Wyken Slough LNR	In	Part 2	
	Daventry Country Park LNR	In	Part 3	
	Dunstable and Whipsnade Downs SSSI Kings and Bakers Wood and Heaths SSSI Dallow Downs and Winsdon Hill SSSI Cottage Bottom Fields LNR Kensworth Chalk Pit SSSI King’s Wood and Rushmere NNR	In	Part 4b	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
Indirect effects on designated sites due to effects on hydrology	Whitacre Heath SSSI	In	Part 1a	As identified within Chapter 22: Water Environment and Flood Risk , the following designated sites include surface water or groundwater dependent habitats and have the potential to be hydrologically connected to the Proposed Development: Whitacre Heath SSSI, Kingsbury Wood SSSI, Bentley Park Wood SSSI for Part 1, Wyken Slough LNR, Newbold Quarry Park LNR, Linnell Road LNR, Nares Gladley Marsh SSSI, the Swift Valley LNR and the Combe Pool SSSI for Part 2, the Daventry Country Park LNR for Part 3, and Cottage Bottom Fields LNR, Dallow Downs and Winsdon Hill SSSI, Kings Woods and Rushmere NNR, Dunstable and Whipsnade Downs SSSI, Kings and Bakers Wood and Heaths SSSI, Kensworth Chalk Pit SSSI, Totternhoe Knolls LNR and SSSI for Part 4b.
	Whitacre Heath SSSI, Kingsbury Wood SSSI, Bentley Park Wood SSSI	In	Part 1b	
	Wyken Slough LNR, Newbold Quarry Park LNR, Linnell Road LNR, Nares Gladley Marsh SSSI, the Swift Valley LNR and the Combe Pool SSSI	In	Part 2	
	Daventry Country Park LNR	In	Part 3	
	Cottage Bottom Fields LNR, Dallow Downs and Winsdon Hill SSSI, Kings Woods and Rushmere NNR, Dunstable and Whipsnade Downs SSSI, Kings and Bakers Wood and Heaths SSSI, Kensworth Chalk Pit SSSI, Totternhoe Knolls LNR and SSSI	In	Part 4b	
Indirect effects on designated sites due to disturbance of qualifying species	Bentley Park Wood SSSI, Wyken Slough LNR.	In	Part 2	Construction activities within 200 m of statutory designated sites may result in increase in noise, vibration,
	Daventry Country Park LNR.	In	Part 3	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	Cottage Bottom Fields LNR, Dallow Downs and Winsdon Hill SSSI, Dunstable and Whipsnade Downs SSSI, Kensworth Chalk Pit SSSI, Kings and Bakers Wood and Heaths SSSI.	In	Part 4b	visual disturbance and temporary lighting which may adversely affect protected and/or notable species which are qualifying features of designated sites. For example, Whitacre Heath SSSI and Daventry Country Park LNR are notified for their wetland breeding birds; Whiteacre Heath SSSI includes breeding Snipe and Redshank, and overwintering hen harrier and short-eared owl. Wyken Slough LNR is noted for its wintering and breeding birds; Bentley Park Wood SSSI boundary noted for breeding black redstart. Cottage Bottom Fields LNR is known to support typical moorland birds such as. Wheatear, Whinchat, Stonechat and Ring Ouzel. Kings and Bakers Wood and Heaths SSSI National and Regional rarities of fungi and insects found in lowland heath and acidic grassland. Dunstable and Whipsnade Downs SSSI and Dallow Downs and Winsdon Hill SSSI are both known to support important population of invertebrate in particular butterflies,

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
				including uncommon and local distribution species for the county.
<i>Non-statutory designated sites</i>				
Direct impacts to non-statutory designated sites from construction and temporary works, resulting in habitat degradation and loss.	All non-statutory designated sites located wholly or partially within the EIA Scoping Boundary for Parts 1, 3, and 4, and within the Indicative Work Area for Part 2. Refer to Appendix 13-1 for a full list.	In	All	Of the 487 non-statutory designated sites (including 247 pLWS / cLWS) identified with the study area, 38 LWS / CWS and 48 pLWS are located wholly or partially within the EIA Scoping Boundary. The construction works may result in habitat degradation, permanent and temporary habitat loss within these sites.
Temporary direct effects on non-statutory designated sites due to: - Airborne pollution within 200 m of the EIA Scoping Boundary - Run-off to these sites, due to their hydrological connection with the EIA Scoping Boundary - Compaction of tree root systems	All non-statutory designated sites within 200 m of the EIA Scoping Boundary for Parts 1, 3, and 4, and of 200 m of the Indicative Work Area for Part 2. Refer to Appendix 13-1 for a full list.	In	All	Construction activities may result in deposition of airborne pollutants from vehicle or plant emissions. Within the 200 m study area (Ref. 51), there are 161 non-statutory sites; including 1 SINC, 79 LWS/CWS and 81 pLWS. Construction activities may have an impact on hydrological pathways connected to designated sites through run off of pollutants or sediment. Where designated sites are located within or adjacent to the EIA

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
				Scoping Boundary, tree roots are at risk from compaction, e.g. through use of a new access track by vehicles.
Indirect effects on non-statutory designated sites due to effects on hydrology	Fazeley Canal LWS Birmingham and Fazeley Canal pLWS, Minworth Sewage Works, SINC/SLINC,	In	Part 1a	There are 100 non-statutory designated sites within the study area, which include surface water or groundwater dependent habitats that have the potential to be hydrologically connected to the Proposed Development. Non-statutory sites with groundwater or surface water dependent habitats (such as springs, wet heath, swamp (mesotrophic and reedbed), fen, wet woodland, wet grassland) could be indirectly impacted by changes in water level, water flow, water quality during the construction of the Proposed Development. Effects may include, causing habitat degradation or temporary loss during construction as a result of sediment or pollutant runoff via connecting watercourse. Which has the potential to cause damage / disturbance of qualifying species.
	River Tame LWS, Hams Hall Woodland LWS / pLWs, Dunton Woodland LWS, Lea Marston LWS, Lea Marston Old Quarry LWS, Extension to Marston Old Quarry pLWS, Coton Pools LWS, Kingsbury Wetlands (Water Park) pLWS, Lea Bridge Pools, Wood pLWs, The Bogs LWS, Flanders Hall Woodlands LWS, Monks Park Wood and Bratts Waste pLWS, Merevale Lake Woodlands LWS, Black Pool & Abbey Pool pLWS, Ward's Hill LWS, the Outwoods'pLWS	In	Part 1b	
	Hartshill Lagoons, Spring Wood and Field pLWS, Bungalow Meadows pLWS, Boons Wharf LWS, Coventry Canal pLWS, Old tip pLWS, Lenton Lane Swamp LWS, Wyken Slough LWS, Bloors Spinney and Stretton Wharf pLWS, River Avon Tributaries	In	Part 2	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	LWS, Canal Arm and Field pLWS, Oxford Canal pLWS, Noewbold Quarry Park LWS, River Swift pLWS, Sowbridge Bottom Meadows LWS, Bluebell Walk LWS, Allans Meadow LWS, Hilmorton Marsh LWS, Hollmorton Marsh pLWS, Hillmorton Canal Meadows LWS, Grassland near Hilmoprton Locks pLWS, Hill Morston Radio Station pLWS and Rugby Radio Station A5 Meadows LWS, Grand Union Canal Brook pLWS, 4005 pLWS, Grand Union Canal – Welton LWS, 571 pLWS, 427 pLWS, 425 pLWS, 441 pLWS, 442 pLWS, 447 pLWS, 446 pLWS, 449 pLWS, 448 pLWS, Weedon A5 Field LWS, Weedon Depot Canal LWS, Weedon Marsh LWS, 458 pLWS, Stowe Wood LWS, Woodhill Plantation LWS, 463 pLWS, Dovecote Meadow LWS, Dovecote Farm Meadow South pLWS, Dovecote Farm Meadow north pLWS, 462 pLWS, GUC – Bugbrooke LWS, 467pLWS, 468 pLWS, 250 pLWS, GUC Northampton Arm LWS, 239 pLWS, Longfield LWS, Gayton Reserve Lake LWS, Gayton Meadow			

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	pLWS, 240 pLWS, 241 pLWS, 242 pLWS, Stoke Bruerne Brickpits LWS, Dogsmouth Brook Meadow LWS, Cosgrove Priority Mill Stream LWS, River Ouse at Wolverton LWS, Manor Farm LWS, Stony Stratford Nature Reserve LWS, Mount Farm Lake LWS, Caldecote Lake LWS, Ouzel Valley CWS, River Ouzel CWS, Church Meadows CWS, Tiddenfoot Park CWS, Rackley Hill Pit CWS			
	Daventry Country Park LWS, Drayton Reservoir pLWS, 4005 pLWS, 4007 pLWS, 4008 pLWS, 4009 pLWS, Grand Union Canal Brook pLWS.	In	Part 3	
	Waterhall Park LWS	In	Part 4a	
	Great Brickhill Field LWS, The Moor & Great Firs Great Brickhill LWS, Utcoate Grange Meadows CWS, Double Arches Pit CWS, Battlesden Lake CWS, Clipstone Brook CWS, Ouzel Valley CWS	In	Part 4b	
Indirect effects on non-statutory designated sites due	Minworth Sewage Treatment Works SINC	In	Part 1a	Construction activities within 200 m of non-statutory designated sites may result in increase in
	Lea Marston Lake LWS	In	Part 1b	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
to disturbance of qualifying species	Harthill's Quarries LWS, Rawn Hill LWS, River Avon & tributaries LWS, Wyken Slough LWS, Coventry Canal pLWS, Oxford Canal pLWS, Thrump Covert LWS.	In	Part 2	noise, vibration, visual disturbance and temporary lighting which may adversely affect protected and/or notable species which are qualifying features of designated sites. For example, Minworth Sewage Treatment Works SINC is noted for ornithological interest, Rawn Hill and Harthill's Quarries are known to support reptiles and amphibians, River Avon & tributaries LWS is known for its diverse bankside habitat which support water vole and otter. Daventry Country Park LWS and Lea Marston Lake LWS are notified for its wetland breeding birds. Coventry Canal pLWS is noted for invertebrates and amphibians; and the Oxford Canal pLWS is known to support water vole and otters. Wyken Slough LWS is noted for its wintering and breeding birds; Thrump Covert LWS listed as a nesting site for wetland birds. Whipsnade Downs CWS is known for its rare butterfly population and Waterhall Park LWS is known to support amphibians.
	Daventry Country Park LWS	In	Part 3	
	Waterhall Park LWS	In	Part 4a	
	Whipsnade Downs CWS	In	Part 4b	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
				Other sites to be assessed will be identified within the ES.
Habitats				
Direct impacts (potentially irreversible) to ancient woodland from construction and temporary works, resulting in habitat degradation and loss	Bentley Park Wood ARW, Dunton Coppice ASNW, Gallops Hill ASNW, Gallops Hill Wood ARW, Holly Thicks ARW	In	Part 1b	There are 23 areas of ancient woodland located within 200 m of the EIA Scoping Boundary for Parts 1b, 2 and 4b; however, none are located within the EIA Scoping Boundary itself, but nine are located adjacent to the EIA Scoping Boundary for Parts 1b and 4b. The construction works may result in loss of ancient trees or habitat degradation, including ground flora and shrub layer in the woodland.
	Bragenham Wood ASNW, Unnamed (Slough Wood) ASNW, Unnamed (Bush Wood) ASNW, Badgerdell Wood ASNW	In	Part 4b	
Temporary direct effects on ancient woodlands due to: - Airborne pollution within 200 m of the EIA Scoping Boundary - Run-off to nearby sites and those hydrologically connected with the EIA Scoping Boundary - Compaction of tree root systems	Bentley Park Wood ARW, Bentley Park Wood ASNW, Dunton Coppice ASNW, Drybrooks Wood ARW, Gallops Hill Wood ARW, Gallops Hill Wood ASNW, Holly Thicks ARW.	In	Part 1b	There are 23 areas of ancient woodland located within 200 m of the EIA Scoping Boundary. Construction activities may result in the deposition of airborne pollutants (e.g. dust) from vehicle or plant emissions in these areas. Construction activities may have an impact on ancient woodland through run off of ground pollutants
	All Oaks Wood ASNW (Cathiron Lane), Linsdale Wood ASNW, Purley Park ASNW, Rawn Hill Wood ASNW, Skewbridge Spinney ARW, Unnamed ASNW (east of Spring Wood, Hartshill)	In	Part 2	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	Badgerdell Wood ASNW, Bragenham Wood ASNW, Bushy Common Wood ASNW, Bushy Common Wood ARW, Castlecroft Wood ASNW, Duncombe Wood ASNW, Duncombe Wood ARW, Little John's Wood ASNW, Slough Wood ASNW, Sallowspring Wood ASNW	In	Part 4b	(from vehicles and plant) or sediment whilst moving soils. Ancient woodland tree roots are at risk from compaction and impacts to seed bed during soil movements.
Permanent, direct loss of habitats during construction, including priority habitats	Habitats, including priority habitats such as coastal and floodplain grazing marsh, deciduous woodland, good quality semi-improved grassland, lowland meadows, lowland fens, hedgerows, ponds, traditional orchard.	In	All Parts	The desk study identified eight main priority habitat types within the study area. Any new above ground infrastructure may result in the loss of priority habitats.
Direct temporary damage or loss of, or changes to, habitats, including priority habitats	Habitats, including priority habitats such as coastal and floodplain grazing marsh, deciduous woodland, good quality semi-improved grassland, lowland meadows, lowland fens, hedgerows, ponds, traditional orchard.	In	All Parts	There is also a risk of causing habitat degradation from temporary works including ground investigation and placement of storage and welfare facilities. This could also cause loss and severance of commuting and foraging habitats during construction.
Indirect temporary effects on groundwater and surface water dependent habitats, including	Groundwater and surface water dependent habitats	In	All Parts	There is a risk of causing habitat degradation or loss due to changes in hydrology and water quality.

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
priority habitats, due to hydrological changes				
Direct and long-term effects on habitat type and condition during habitat reinstatement and enhancement	Habitats, including priority habitats such as coastal and floodplain grazing marsh, deciduous woodland, good quality semi-improved grassland, lowland meadows, lowland fens, hedgerows, ponds, traditional orchard.	In	All Parts	Direct impacts associated with changes in land use resulting from the Proposed Development, including habitat reinstatement will be considered within the assessment.
<i>Notable and protected species</i>				
Killing and injury of protected and notable species	Amphibians, Badger, Birds, Bats, Reptiles, Otter, Water Vole, Other Mammals, Invertebrates, Plants	In	All parts	The construction works may result in killing and injury of protected or notable species.
Disturbance / displacement of protected and notable species through permanent and temporary habitat loss	Amphibians, Badger, Birds, Bats, Reptiles, Otter, Water Vole, Other Mammals, Invertebrates.	In	All parts	Vegetation clearance and other pre-construction works (e.g. ground investigation and installation of storage and welfare facilities) are likely to result in permanent and temporary loss of habitat. This could affect available foraging and resting places, cause displacement of animals, increasing competition, affect breeding success and risk of predation for some species.
Temporary disturbance of protected and notable species due to noise, visual	Amphibians, Badger, Birds, Bats, Reptiles, Otter, Water Vole, Other Mammals, Invertebrates.	In	All parts	Disturbance from noise, visual disturbance, artificial lighting and vibration may adversely affect

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
disturbance, artificial lighting and vibration.				species, such as badgers, barn owl, otters and bats, through disturbance and cause displacement. Piling along the canal network is likely to have the most significant adverse effect on species using the canals, adjacent habitats and bridges as resting places. The impacts of noise and artificial lighting during construction will be established through the EIA process.
Displacement of protected and notable species through temporary habitat severance and fragmentation.	Amphibians, Badger, Birds, Bats, Reptiles, Otter, Water Vole, Other Mammals, Invertebrates.	In	All Parts	Construction may result in temporary habitat severance affecting protected and notable species' ability to commute between foraging areas, resting places and breeding sites, e.g. badger, reptile, amphibians, water voles. The greatest adverse effects are likely to be where habitats are fragmented e.g. where the Part 1b pipeline severs the habitat (e.g. between The Bogs LWS and Flanders Hall Woodland LWS) and along important linear features which may be important wildlife corridors (e.g. railway lines, water courses, road

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
				verges, interconnecting woodland and hedges).
Potential to introduce and/ or spread invasive non-native species and disease	INNS.	In	All Parts	Eighteen species of invasive non-native species have been identified with the study area. The construction works may result in unintentionally spreading of unidentified invasive non-native species and degradation of the original habitat. Also refer to Chapter 12: Ecology – Aquatic for invasive non-native species relevant to aquatic ecology.
Changes to the habitat type and condition during habitat reinstatement and enhancement	Amphibians, Badger, Birds, Bats, Reptiles, Otter, Water Vole, Other Mammals, Invertebrates, Plants.	In	All Parts	Direct impacts associated with changes in land use resulting from the Proposed Development, including habitat reinstatement will be considered within the assessment.

Operational Phase

- 13.6.3 A summary of the scoping of potential effects from the Proposed Development during the operational phase is provided within **Table 13-17** below. Similarly to the previous table, **Table 13-17** focusses on identifying potential impacts and important ecological features that require further assessment, and as such would need to be scoped in to the EIA. Where specific impacts or receptors are not referenced, these can be assumed to be scoped out.

Table 13-17: Potential effects during the operational phase – Terrestrial Ecology

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
<i>Statutory designated sites</i>				
Indirect impacts to statutory designated sites of international importance beyond 2 km of the Proposed Development, potentially hydrologically connected with the EIA Scoping Boundary of the Proposed Development	Upper Nene Valley SPA and Ramsar	In	Part 3	A potential impact pathway (and thus potential effect) during operation on water quality due to the works to Drayton and Daventry Reservoirs, which are upstream in the headwaters of the River Nene catchment, has been identified. As such, the Upper Nene Valley Gravel Pits SPA / Ramsar has been scoped in for further assessment.
	Ensor Pool's SAC / SSSI Chilterns Beechwood SAC / SSSI	Out	Parts 2 and 4b	Ensor Pool's SAC / SSSI and Chilterns Beechwood SAC / SSSI are not hydrologically connected to the EIA Scoping Boundary of the Proposed Development and as such, have been scoped out of further assessment.
Direct and indirect impacts on statutory designated sites due to effects on hydrology, e.g. due to	Whitacre Heath SSSI	In	Part 1a	Potential effects from changes to hydrology may arise during operation due to altered connectivity and operational
	Whitacre Heath SSSI, Kingsbury Wood SSSI, Bentley Park Wood SSSI	In	Part 1b	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
impacts on surface water or groundwater flows and quality	Wyken Slough LNR, Newbold Quarry Park LNR, Linnell Road LNR, Nares Gladley Marsh SSSI, the Swift Valley LNR and the Combe Pool SSSI	In	Part 2	activities, such as management and maintenance works, resulting in sediment run off or biological pollutants (e.g. invasive species).
	Daventry Country Park LNR	In	Part 3	As identified within Chapter 22: Water Environment and Flood Risk , the following designated sites include surface water or groundwater dependent habitats and have the potential to be hydrologically connected to the Proposed Development: Whitacre Heath SSSI, Kingsbury Wood SSSI, Bentley Park Wood SSSI for Part 1, Wyken Slough LNR, Newbold Quarry Park LNR, Linnell Road LNR, Nares Gladley Marsh SSSI, the Swift Valley LNR and the Combe Pool SSSI for Part 2, the Daventry Country Park LNR for Part 3, and Cottage Bottom Fields LNR, Dallow Downs and Winsdon Hill SSSI, Kings Woods and Rushmere NNR, Dunstable and Whipsnade Downs SSSI, Kings
	Cottage Bottom Fields LNR, Dallow Downs and Winsdon Hill SSSI, Kings Woods and Rushmere NNR, Dunstable and Whipsnade Downs SSSI, Kings and Bakers Wood and Heaths SSSI, Kensworth Chalk Pit SSSI, Totternhoe Knolls LNR and SSSI	In	Part 4b	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
				and Bakers Wood and Heaths SSSI, Kensworth Chalk Pit SSSI, Totternhoe Knolls LNR and SSSI for Part 4b.
Indirect effects on designated sites due to disturbance of qualifying species	N/A	Out	All Parts	Disturbance to qualifying features of statutory designated sites from the operation and maintenance of the Proposed Development is likely to be limited and unlikely to be significant. There is no permanent operational noise or lighting associated with Parts 1b pipeline, 3 and 4b of the Proposed Development. Any maintenance works would be ad hoc and limited. In addition, there are no statutory designated sites in close vicinity to Part 1a, Part 1b break pressure tank, Part 2 pumping stations and Part 4a of the Proposed Development. As such, this impact pathway (and thus potential effect) is scoped out of further assessment.
<i>Non-statutory designated sites</i>				

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
Direct and indirect effects on non-statutory designated sites due to management and maintenance	All non-statutory designated sites located wholly or partially within the EIA Scoping Boundary for Parts 1, 3, and 4, and within the Indicative Work Area for Part 2. Refer to Appendix 13-1 for a full list.	In	All	Of the 487 non-statutory designated sites (including 247 pLWS / cLWS) identified with the study area, 38 LWS / CWS and 48 pLWS are located wholly or partially within the EIA Scoping Boundary. The operational works may result in habitat degradation, permanent and temporary habitat loss within these sites.
Direct and indirect effects on non-statutory designated sites due to effects on hydrology, e.g. due to impacts on surface water or groundwater flows and quality	Fazeley Canal LWS Birmingham and Fazeley Canal pLWS, Minworth Sewage Works, SINC/SLINC,	In	Part 1a	Potential effects from changes to hydrology may arise during operation due to altered connectivity and operational activities, such as management and maintenance, may have an impact on hydrological pathways connected to non-designated sites and result in sediment run off or biological pollutants (e.g. invasive species). A review of waterbodies impacted by the Proposed Development will be carried out to understand the risk of likely significant effects on ecological
	River Tame LWS, Hams Hall Woodland LWS / pLWs, Dunton Woodland LWS, Lea Marston LWS, Lea Marston Old Quarry LWS, Extension to Marston Old Quarry pLWS, Coton Pools LWS, Kingsbury Wetlands (Water Park) pLWS, Lea Bridge Pools, Wood pLWs, The Bogs LWS, Flanders Hall Woodlands LWS, Monks Park Wood and Bratts Waste pLWS, Merevale Lake Woodlands LWS, Black Pool & Abbey Pool pLWS,	In	Part 1b	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	Ward's Hill LWS, the Outwoods'pLWS			receptors from any potential changes to the flow, quality or quantity of water.
	Hartshill Lagoons, Spring Wood and Field pLWS, Bungalow Meadows pLWS, Boons Wharf LWS, Coventry Canal pLWS, Old tip pLWS, Lenton Lane Swamp LWS, Wyken Slough LWS, Bloors Spinney and Stretton Wharf pLWS, River Avon Tributaries LWS, Canal Arm and Field pLWS, Oxford Canal pLWS, Noewbold Quarry Park LWS, River Swift pLWS, Sowbridge Bottom Meadows LWS, Bluebell Walk LWS, Allans Meadow LWS, Hilmorton Marsh LWS, Hollmorton Marsh pLWS, Hillmorton Canal Meadows LWS, Grassland near Hilmoprton Locks pLWS, Hill Morston Radio Station pLWS and Rugby Radio Station A5 Meadows LWS, Grand Union Canal Brook pLWS, 4005 pLWS, Grand Union Canal – Welton LWS, 571 pLWS, 427 pLWS, 425 pLWS, 441 pLWS, 442 pLWS, 447 pLWS, 446 pLWS, 449 pLWS, 448 pLWS, Weedon	In	Part 2	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	A5 Field LWS, Weedon Depot Canal LWS, Weedon Marsh LWS, 458 pLWS, Stowe Wood LWS, Woodhill Plantation LWS, 463 pLWS, Dovecote Meadow LWS, Dovecote Farm Meadow South pLWS, Dovecote Farm Meadow north pLWS, 462 pLWS, GUC – Bugbrooke LWS, 467pLWS, 468 pLWS, 250 pLWS, GUC Northampton Arm LWS, 239 pLWS, Longfield LWS, Gayton Reserve Lake LWS, Gayton Meadow pLWS, 240 pLWS, 241 pLWS, 242 pLWS, Stoke Bruerne Brickpits LWS, Dogsmouth Brook Meadow LWS, Cosgrove Priority Mill Stream LWS, River Ouse at Wolverton LWS, Manor Farm LWS, Stony Stratford Nature Reserve LWS, Mount Farm Lake LWS, Caldecote Lake LWS, Ouzel Valley CWS. River Ouzel CWS, Church Meadows CWS, Tiddenfoot Park CWS, Rackley Hill Pit CWS			
	Daventry Country Park LWS, Drayton Reservoir pLWS, 4005	In	Part 3	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	pLWS, 4007 pLWS, 4008 pLWS, 4009 pLWS, Grand Union Canal Brook pLWS.			
	Waterhall Park LWS	In	Part 4a	
	Great Brickhill Field LWS, The Moor & Great Firs Great Brickhill LWS, Utcoate Grange Meadows CWS, Double Arches Pit CWS, Battlesden Lake CWS, Clipstone Brook CWS, Ouzel Valley CWS.	In	Part 4b	
Indirect effects on non-statutory designated sites due to disturbance of qualifying species	N/A	Out	Parts 1b (pipeline), 3 and 4b	There is no permanent operational noise or lighting associated with Parts 1b pipeline, 3 and 4b of the Proposed Development. Any maintenance works would be ad hoc and limited. As such, this impact pathway (and thus potential effect) has been scoped out for these parts of the Proposed Development.
	Minworth Sewage Treatment Works SINC	In	Part 1a	Disturbance from the operation of Part 1a, Part 1b break pressure tank, Part 2 pumping stations and Part 4a on adjacent non-statutory designated sites due to
	Bentley Common LWS	In	Part 1b (Break Pressure Tank)	
	Braunston Pocket Park Meadow pLWS, Coventry Canal pLWS,	In	Part 2 (pumping stations)	

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
	Hawkesbury Spinney and Old Tip LWS, Old Tip pLWS, Hillmorton Marsh LWS, Hillmorton Canal Meadows LWS, Grassland near Hilmorton Locks pLWS, Ouzel Valley CWS, Oxford Canal pLWS, River Ouzel CWS.			operational noise and lighting has been scoped in on a precautionary basis.
	Waterhall Park LWS	In	Part 4a	
Habitats				
Permanent impacts to ancient woodland from operations	N/A	Out	All	There are no anticipated effects on ancient woodland, due to the nature of the operational and maintenance works of the Proposed Development.
Effects on priority habitats due to the implementation of landscape design, habitat management and maintenance	Habitats, including priority habitats such as coastal and floodplain grazing marsh, deciduous woodland, good quality semi-improved grassland, lowland meadows, lowland fens, hedgerows, ponds, traditional orchard.	In	All Parts	The desk study identified 8 main priority habitat types within the study area, wholly or partially located within the EIA Scoping Boundary. Site operation and management, e.g. maintenance operations required to create or enhance habitats will be summarised within the ES.
Indirect effects on groundwater and surface water dependent habitats,	Groundwater and surface water dependent habitats	In	All Parts	There is a risk associated with operational impacts on groundwater and surface water

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
including priority habitats, due to hydrological changes				flows and quality, such as increased flows or quantities of water entering watercourses or feeding reliant habitats during the operation and maintenance activities of the Proposed Development.
<i>Protected and notable species</i>				
Disturbance/displacement of protected and notable species through increased disturbance	Amphibians, Badger, Birds, Bats, Reptiles, Otter, Water Vole, Other Mammals, Invertebrates.	In	Parts 1a, 1b (Break Pressure Tank), 2 and 4a	The Proposed Development may result in increased levels of disturbance, depending on the activity this may comprise visual, lighting and noise disturbance. Nocturnal species (such as barn owl, bats, otters and/or badgers) are at risk of disturbance and potentially displacement from the use of artificial lighting during operational phase. Sensitive species such as otter, badger and barn owl are likely to be displaced from habitats where there is an increase in human activity.

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
		Out	Parts 1b (pipeline), 3 and 4b	There is no permanent operational noise or lighting associated with Parts 1b pipeline, 3 and 4b of the Proposed Development. Any maintenance works would be ad hoc and limited. As such, this impact pathway (and thus potential effect) has been scoped out for these parts of the Proposed Development.
Indirect effect on protected or notable species through hydrological changes.	Water vole and otter	In	Parts 1a, 2, 3 and 4a	There is a risk of changes to flow or quantity of water entering watercourses as a result of the operation and maintenance activities of the Proposed Development which could affect protected or notable species such as water vole and otter.
Potential introduction and or spread of non-native species and disease.	INNS	In	Parts 1a, 2, 3 and 4a	Potential release of invasive non-native species during routine habitat and post construction maintenance activities and washouts. Also refer to Chapter 12: Ecology – Aquatic for invasive non-native

Potential Effects	Important Ecological Features (IEFs)	Scoped In / Out	Proposed Development Part(s)	Rationale
				species relevant to aquatic ecology.

13.7 Approach to Assessment

Establishing Baseline Conditions

- 13.7.1 Collection of further baseline data will include undertaking surveys and desk-based assessments to provide information on the distribution of protected and notable habitats and species. Additional surveys and assessments are currently planned and/or underway to obtain baseline data relevant to the Proposed Development. The purpose of this is to provide the basis for a robust assessment to be undertaken. The study area for these surveys is as described in Section 13.4.
- 13.7.2 Additional baseline information will be obtained through the following surveys:
- a. UK habitat survey and condition assessments;
 - b. Bat roost suitability surveys, supplemented by tree-climbing inspections, and emergence and re-entry surveys as required;
 - c. Deployment of static bat detectors;
 - d. Badger surveys;
 - e. Barn owl surveys;
 - f. Common reptiles surveys;
 - g. Great crested newt surveys;
 - h. Hazel dormouse surveys;
 - i. Wintering bird surveys;
 - j. Breeding bird surveys;
 - k. Water vole and mink surveys;
 - l. Otter surveys; and
 - m. Terrestrial invertebrate surveys.

Assessment Methodology

- 13.7.3 The assessment methodology and criteria to be used in the terrestrial ecology assessment is the same as set out within **Chapter 12: Ecology – Aquatic** and, therefore, has not been repeated here.

13.8 Assumptions, Limitations, and Uncertainties

- 13.8.1 Limitations pertaining to the RAPID gated assessments are set out in the reports referenced in **Appendix 13-1** within Volume 3 of this EIA Scoping Report and their context or continued relevance will be described in the Terrestrial Ecology ES Chapter.
- 13.8.2 Terrestrial ecological assessments at Gate 3 have been informed by parallel development of the engineering design, and on-going hydraulic and hydrological modelling, and water quality monitoring and modelling. Where possible, the results of the latest available monitoring and modelling has been used to inform the Gate 3 environmental assessments. However, it has sometimes been necessary, due to the timescales of concurrent

workstreams, to rely on previous iterations of such monitoring and modelling. Therefore, the EIA will need to be supported by the final engineering design and modelling, to accurately support the assessment of potential effects of the Proposed Development.

- 13.8.3 The scope of the assessment presented in this chapter reflects the information and stakeholder responses obtained and evaluated at the time of reporting, and has referenced published data, records and web-based information obtained to date.
- 13.8.4 There are no survey-specific constraints that represent a significant limitation or data gap and the baseline that has been established is suitably robust, having been developed and refined through the RAPID gated process.

13.9 Approach to Mitigation

- 13.9.1 Mitigation options will be set out in detail in the terrestrial ecology ES Chapter. Likely mitigation options have been developed through the RAPID gated process, in consultation with regulators and stakeholders as described earlier in this chapter. These mitigation options will be further developed through EIA, in continued liaison with the engineering design workstreams.
- 13.9.2 Where practicable, mitigation measures will be incorporated into the design of the Proposed Development and/or how it shall be constructed. Through iterative assessment, potential impacts will be predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as practicable. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset. This embedded mitigation/mitigation by design approach will be considered when evaluating the significance of the potential impacts.
- 13.9.3 The impact assessments will be undertaken following consideration of the embedded mitigation measures established through working with the design and engineering workstreams. In accordance with CIEEM guidance, (Ref. 38) all ecological features valued at local level or above, and with the potential to be affected by the Proposed Development will be taken forward for the assessment of likely significant effects. INNS listed under Schedule 9 of the Wildlife & Countryside Act 1981 (Ref. 4), or other relevant legislation, are also taken forward for assessment. Construction mitigation will be specified within a Code of Construction Practice (CoCP) which will be submitted with the DCO application.
- 13.9.4 Site operation and management, e.g. maintenance operations required to create or enhance habitats would likely be captured in a Habitat Management and Monitoring Plan (HMMP) (Ref. 52), as necessary. Instructions and processes for the management and operations of habitat creation, including methods to protect priority habitats, would likely be captured in an Outline Landscape and Ecological Management Plan (LEMP), as required. For each of the impacted protected species, either mitigation strategies, method statements or draft licence applications would be developed for submission with the DCO application, as required.

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Chapter 14: Ground Conditions

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14. Ground Conditions

14.1 Introduction

- 14.1.1 This chapter presents the scope and methodology for the assessment of the potential significant ground conditions effects arising from the construction and operation of the Proposed Development.
- 14.1.2 Ground conditions focusses on, but is not limited to, geology, geological designated sites, mineral resources (Mineral Safeguarding Areas [MSA] and Mineral Consultation Areas [MCA]), hydrogeology and land contamination.
- 14.1.3 It should be noted that there is some overlap between the ground conditions assessment and other EIA Scoping Report topic chapters, as follows:
- a. Groundwater, surface water and ecological receptors are discussed within this chapter as they will be assessed as potential receptors to any land contamination. Groundwater and surface water as strategic resources and/or discharge points, hydrogeological response to dewatering, and flooding are considered in **Chapter 22: Water Environment and Flood Risk** and ecological receptors are considered in more detail in **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial**;
 - b. Pollution related impacts from the construction and operation of the Proposed Development are covered in **Chapter 22: Water Environment and Flood Risk**. Furthermore, pollution related impacts during the operation of the Proposed Development are assumed to be managed under an Environmental Permit (see **Table 14-18**);
 - c. Air pollution related impacts from increased dust during construction is covered in **Chapter 9: Air Quality and Odour**;
 - d. Excavated materials and waste management is also covered in **Chapter 21: Waste and Materials**. Should contaminated soils or groundwater be encountered as part of the construction phase of the Proposed Development, there is the potential that it may need to be removed from the EIA Scoping Boundary as a waste, if it is deemed to represent an unacceptable risk to the identified sensitive receptors. This will be considered as part of the assessment set out within **Chapter 21: Waste and Materials**;
 - e. Effects from the Proposed Development to mineral resources (MSA and MCA) will be assessed within this chapter. Safeguarded minerals sites, defined as operational sites identified in Local Plan documents, such as quarries and wharves, are considered in **Chapter 21: Waste and Materials**; and
 - f. **Chapter 8: Agriculture and Soils** covers property types, agricultural land designations and soils.
- 14.1.4 This chapter is also supported by:
- a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 14-1: Ground Conditions Study Areas**;

- ii. **Figure 14-2: Superficial Geology;**
- iii. **Figure 14-3: Bedrock Geology;** and
- b. The following appendices in Volume 3 of this EIA Scoping Report:
 - i. **Appendix 14-1: Description of Superficial and Bedrock Geology.**

14.1.5 This chapter of the EIA Scoping Report includes an overview of the environmental baseline for ground conditions, it describes the methodology to be used to undertake the assessment, and it indicates the anticipated key issues likely to be associated with the Proposed Development.

14.2 Legislation, Planning Policy Context, and Guidance

14.2.1 Legislation, planning policy and guidance relating to ground conditions is outlined below.

Legislation

14.2.2 The applicable legislation includes:

- a. The Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (as amended) (Ref. 1);
- b. The Water Environment (Water Framework Directive [WFD]) (England and Wales) Regulations 2017 (Ref. 2);
- c. The Groundwater (England and Wales) Regulations (2009) (Ref. 3);
- d. Environmental Protection Act 1990 (Ref. 4);
- e. Water Act 2003 (Ref. 5);
- f. Water Resources Act 1991 (Ref. 6);
- g. Building Act 1984 (Ref. 7);
- h. The Building Regulations 2010 (Ref. 8);
- i. Environment Act 1995 (Ref. 9);
- j. Environment Act 2021 (Ref. 10);
- k. The Planning Act 2008 (Ref. 11);
- l. The Environmental Permitting (England and Wales) Regulations [EPR] 2016 (Ref. 12);
- m. The Hazardous Waste (England and Wales) Regulations 2005 (Ref. 13);
- n. The Environmental Damage (Prevention and Remediation) Regulations 2009 (Ref. 14);
- o. The Anti-Pollution Works Regulations 1999 (Ref. 15); and
- p. The Construction (Design and Management) [CDM] Regulations 2015 (Ref. 16).

14.2.3 The above legislation have informed the identification of sensitive receptors related to baseline ground conditions (Section 14.5) and how they should be managed during construction and operation of the Proposed Development (described within Sections 14.6 and 14.9).

National Policies, Plans and Strategies

- 14.2.4 The relevant national policies, plans and strategies for ground conditions are summarised within **Table 14-1**.

Table 14-1: National policies, plans and strategies – Ground Conditions

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 17)	• Environmental Regulation: Paragraphs 3.8.1, 3.8.6 and 3.8.8. These paragraphs set out how the applicant should consult with relevant consenting authorities, for example the Environment Agency, to discuss the requirements needed for construction and operational activities. Requirements may include the need for environmental permits to be applied for as well as a demonstration that all relevant environmental impacts have been assessed; • Health: Paragraphs 3.12.3 and 3.12.4. These paragraphs set out the requirement for the applicant to identify, assess impacts and discuss potential mitigation measures to reduce impacts on human health. The assessment should consider impacts associated with the project alone and cumulatively with other projects; • Biodiversity and Nature Conservation: Paragraphs 4.3.5, 4.3.6, 4.3.11, 4.3.12, 4.3.14, 4.3.15 and 4.3.17. These paragraphs outline how a project would impact internationally, nationally and locally designated ecological or geological sites and any measures that would reduce potential impacts on these features; • Land Use including Open Space, Green Infrastructure and Green Belt: Paragraphs 4.10.5, 4.10.9, 4.10.15 and 4.10.17. These	Section 14.5 (Baseline Conditions) of this chapter identifies the following, which are related to ground conditions and covered in the NPSWRI and the NPPF: • Geology and geological sites; • Mineral resources (MSA and MCA); • Potential sources of contaminated land; • Receptors to potentially contaminated land including: – Hydrogeological features (aquifer designation and Source Protection Zones (SPZ)); – Surface water features; – Ecological sensitive sites; and – Human health receptors. Potential effects on the above (during the construction and operational stages) are discussed in Section 14.6. The approach to how these will be assessed is discussed in Section 14.7. The approach to mitigation is discussed in Section 14.9. In terms of ground stability, detailed geotechnical desk studies, a Geotechnical Investigation Report (GIR) and a Geotechnical Design Report (GDR) will be undertaken as part of the detailed design to address this issue. A summary of the information available at the time will be included in the ES chapter.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	paragraphs highlight that when a development is proposed in an area of previous development, an assessment should be undertaken to identify potential risks associated with contamination. The assessment should also consider potential mitigation measures to reduce the identified risks posed, including proper management of excavated soils; and • Land Use including Open Space, Green Infrastructure and Green Belt: Paragraphs 4.10.16 and 4.10.28. These paragraphs indicate that MSAs need to be identified and assessed for any impacts from a proposed project. Appropriate mitigation or compensation measures to safeguard mineral resources must be put forward. • Ground stability: Paragraph 4.10.15 states <i>“Where required, a preliminary assessment of ground instability should be carried out at the earliest possible stage. Applicants should ensure that any necessary investigations are undertaken to ascertain that the site is and will remain stable, or can be made so, as part of the development. The site needs to be assessed in context of surrounding areas where subsidence, landslides and land compression could threaten the development during its anticipated life or damage neighbouring land or property. Risks to the quality and quantity of groundwater resources</i>	

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	<i>should also be assessed. This could be in the form of a land stability or slope stability risk assessment report. Planning practice guidance provides further advice on assessing land stability.” See also Planning Policy Guidance for ‘Land stability’ (Ref. 18).</i>	
National Planning Policy Framework (NPPF) (Ref. 19)	Conserving and Enhancing the Natural Environment: section 15, paragraphs 187 to 191. These paragraphs set out the planning policies that contribute to and enhance the natural and local environment. Paragraphs 192 to 195 (Habitats and biodiversity) set out the measures to enhance biodiversity and geodiversity including the identification of habitats and ecological networks and the promotion of their conservation, restoration and enhancement. The principles for evaluating planning applications that could result in harm to these areas are detailed in these sections. Paragraphs 196 to 201 (Ground conditions and pollution section) provide guidance on planning policies around land contamination. In general, it defines the responsibility of the owner and/or developer to secure a safe environment and states that planning policies and decisions should ensure that any new development is appropriate taking account of its likely effects on health and environment, including existing businesses and community facilities. Compliance	

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	to limit values and national objectives should be promoted.	

Local Policy

- 14.2.5 The local policies listed in **Table 14-2** are considered relevant to the scope and methodology of assessment of ground conditions impacts presented in this chapter.

Table 14-2: List of relevant local policy – Ground Conditions

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • Policy TP8: Biodiversity and geodiversity; • Policy TP6: Management of flood risk and water resources; and • Policy TP16: Minerals.	Ref. 20	Policy TP8 sets out requirements for the identification of biodiversity and geology sites of national and local importance (see Section 14.5 of this chapter); “... <i>development proposals which are likely to affect any designated site or important habitat, species or geological feature must be supported by adequate information to ensure that the likely impact of the proposal can be fully assessed</i> ”. Policy TP6 indicates that “... <i>development will not be permitted where a proposal would have a negative impact on surface water (rivers, lakes and canals) or groundwater quantity or quality either directly through pollution of groundwater or by the mobilisation of contaminants already in the ground</i> ”. Potential sources of contamination will be identified, as set out in Section 14.5 of this chapter, along with potential controlled water receptors. Policy TP16 indicates that “... <i>an investigation should be undertaken into the existence of mineral deposits on the site and any viable workable minerals should be extracted</i> ”. These will be identified, as set out in Section 14.5 of this chapter.
	New Local Plan for Birmingham 2042: • Policy CE1: Climate change principles.	Ref. 21	Policy CE1 states that development should adapt and increase resilience to climate change risks through, among others, minimising the adverse impacts on soils and water.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • LP16: Natural landscape; and	Ref. 22	Policy LP16 seeks to “... <i>minimise impacts on, and provide net gains for biodiversity, where possible, relative to the ecological significance of internationally, nationally and locally designated sites of importance for biodiversity</i> ”; also includes sites of geological importance. It is stated that “... <i>all development applications that affect the natural environment will be required to provide sufficient</i>

Local authority	Relevant local policy	Reference	Relevance to the assessment
	LP29: Development considerations.		<i>information and an assessment of those proposals on the natural assets</i>". Section 14.5 of this chapter identifies potential receptors including geological sites. Policy LP29 indicates that it is necessary to identify contaminated and potentially contaminated land prior to development; the quality and hydrology of ground or surface water sources should be protected so as to reduce the risk of pollution and flooding, on site or elsewhere; viable known mineral reserves should not be sterilised; and land should be appropriately remediated so as not to pose a risk to human health and ecology from contamination or mining legacy. Potentially contaminated land sites, mineral areas and potential receptors are identified in Section 14.5.
Warwickshire County Council	Warwickshire County Council, Council Plan 2022 – 2027: No relevant policies identified for Ground Conditions.	Ref. 23	Not applicable (none identified)
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: - NE1: Green infrastructure; - NE3: Biodiversity and geodiversity; - NE4: Managing flood risk and water quality; and - BE1: Contamination and land instability.	Ref. 24	Policy NE1 indicates that "<i>...green infrastructure assets will be created, protected, managed and enhanced</i>"; including conserving and enhancing existing quarry sites and geological exposures in order to "<i>...maintain the geological record and to conserve cultural heritage assets</i>". Geological sites are identified in Section 14.5. Policy NE3 indicates that development proposals should ensure "<i>...that ecological networks and services, biodiversity and geological features are conserved, enhanced, restored and where appropriate, created</i>", and proposals should be accompanied by preliminary assessment. Where adverse impact is to be identified, the assessment must set out a mitigation strategy to halt and reverse the loss of biodiversity or how it will reduce its geological

Local authority	Relevant local policy	Reference	Relevance to the assessment
			impact. Geological sites are identified in Section 14.5 and anticipated potential impacts are discussed in Section 14.9. Policy NE4 states that “...development proposals will be required to protect and improve the quality of water bodies in and adjacent to the borough”. Where a source of groundwater contamination is located on site, “...a groundwater risk assessment demonstrating that the development proposal and subsequent works will not lead to the deterioration of groundwater quality and quantity is required to accompany the planning application”. If required, a groundwater risk assessment will be undertaken as part of the assessment stage. Policy BE1 sets out requirements for development proposals located on or adjacent to land which may have been subject to contamination and/or land instability and will need to demonstrate that measures can be taken to effectively mitigate the impacts of land contamination and instability on public health, environmental quality, the built environment and general amenity, with the proposed site made suitable for the proposed final use.
	Borough Plan Review 2021-2039: • EN3: Biodiversity and geodiversity.	Ref. 25	No new policies for ground conditions identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Coventry City Council	Coventry Local Plan (2011-2031): • EM6: Redevelopment of previously developed land; • EM9: Safeguarding mineral resources;	Ref. 26	Policy EM6 states that “...development will be permitted where proposals do not have a negative impact on water quality, either directly through pollution of surface or ground water or indirectly through the treatment of waste water”. Furthermore, “Developers and operators must provide adequate information when submitting their proposals so that the potential impact on groundwater resources and quality can be adequately

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- EM10: Non-mineral development in MSA; and - GE3: Biodiversity, geological, landscape and archaeological conservation.		<i>assessed, demonstrating there would be no adverse effect on water resources. Development will not be permitted within a groundwater SPZ1 which would physically disturb an aquifer.</i> Policy EM9 indicated that if development is proposed within an MSA, the application needs to acknowledge the presence of the mineral reserves. Policy EM10 indicates that “...<i>non-mineral development proposals in the designated MSA should assess and evaluate the legacy of past mining heritage</i>” and “...<i>ensure that development does not entirely sterilise any potential future mineral extraction should this become viable and desirable</i>”. Policy GE3 indicates that “<i>Sites of Special Scientific Interest (SSSI), Local Nature Reserves (LNR), Local Wildlife and Geological Sites will be protected and enhanced. Proposals for development on other sites, having biodiversity or geological conservation value, will be permitted provided that they protect, enhance and/or restore habitat biodiversity</i>”.
	Local Plan Review: Issues and Options Consultation (2023)	Ref. 27	With reference to policy EM6, it was concluded that the policy needs a minor technical update in terms of specific reference to Water Environment Regulations (Ref. 2).
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: - NE1: Protecting designated biodiversity and geodiversity assets; and - SDC7: Protection of water environment and water supply.	Ref. 28	According to policy NE1, Rugby Borough Council “...<i>will protect designated areas and species of international, national and local importance for biodiversity and geodiversity</i>”. Planning permission will be refused if significant harm resulting from development affecting biodiversity or geodiversity cannot be avoided, mitigated, and as a last resort compensated for. Policy SDC7 indicates that “...<i>development will not be permitted where proposals have a negative impact on water quality, either directly through pollution of surface or ground water, or indirectly</i>”.

Local authority	Relevant local policy	Reference	Relevance to the assessment
			<i>through the overloading of Wastewater Treatment Works”, and where “...the sensitivity of the groundwater environment, or the risk posed by the type of development is deemed to pose an unacceptable risk of pollution of the underlying aquifer”.</i>
	Rugby Borough Local Plan review – issues and options consultation (2023)	Ref. 29	No new policies for ground conditions identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: • BN2: Biodiversity; and • BN9: Planning for pollution control	Ref. 30	Policy BN2 supports “...development that will maintain and enhance existing designations and assets or delivers a net gain in biodiversity” (including geological sites). Additionally, “Development management decisions will reflect the hierarchy of biodiversity and geodiversity designations”, and in case of loss of the asset, where mitigation or compensation cannot be agreed, the development will not be permitted. Policy BN9 states that remediation of contaminated land will be ensured so as not to pose a risk to health and the environment.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: • ENV5: Biodiversity	Ref. 31	Policy ENV5 highlights that “...all proposals likely to affect biodiversity will be expected to assess their impact through an ecological assessment and include details of mitigation or compensation, where harm will be caused. (...) If significant harm cannot firstly be avoided, adequately mitigated or as a last resort, compensated for, or should a proposal lead to the loss or deterioration of irreplaceable habitats, then development will not be permitted.” And “Proposals should seek to achieve a net gain for biodiversity, including the creation and management of new habitats, strengthening existing networks of habitats, avoiding the fragmentation of habitats and links and addressing the

Local authority	Relevant local policy	Reference	Relevance to the assessment
			<i>Northamptonshire Biodiversity Action Plan local priorities for habitats and species."</i>
	New Local Plan for West Northamptonshire 2041	Ref. 32	No new policies for ground conditions identified at this stage.
Milton Keynes City Council	Plan: MK 2016 – 2031: • NE1: Protection of sites; • NE3: Biodiversity and geological enhancement; and • NE6: Environmental pollution	Ref. 33	Policy NE1 indicates the reasons why development proposals would be permitted in the event that there is the potential for harm to nature conservation or geological interest sites; reasons include the absence of suitable alternatives, application of compensatory provisions and the presence of imperative reasons of overriding public interest that justify the development. Policy NE3 indicates that "...development proposals will be required to maintain and protect biodiversity and geological resources". Furthermore, "If significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated or, as a last resort, compensated for then planning permission should be refused." Policy NE6 indicates that planning applications for proposals must be accompanied by a Preliminary Contaminated Land Risk Assessment to determine the likelihood of any ground, groundwater or gas contamination of the sites for proposals on land that is potentially contaminated, used for industrial, commercial or utilities purposes, or vulnerable to contamination.
	New City Plan: Ambition and Objectives Consultation 2023	Ref. 34	No new policies for ground conditions identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033:	Ref. 35	Policy NE1 indicates how development proposals should protect / enhance sites of geological interest; developments which would result in damage to or loss of a site of geological value of regional

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• NE1 Biodiversity and geodiversity; and • NE5: Pollution, air quality and contaminated land		or local importance will not be permitted except in exceptional circumstances. Policy NE5 indicates that development on or near land that is or may be affected by contamination will only be permitted where an appropriate Contaminated Land Assessment has been carried out as part of the application “...to identify any risks to human health, the natural environment or water quality”; and that “...where contamination is found which would pose an unacceptable risk to people’s health, the natural environment or water quality, the council will impose a condition, if appropriate, to ensure the applicant undertakes a desktop study, and if required, an intrusive site investigation, remedial measures and a validation report to ensure that the site is suitable for the proposed use and that the development can safely proceed.”
	The Local Plan for Buckinghamshire – Draft Vision and Objectives	Ref. 36	A new Buckinghamshire-wide local plan will be in place by April 2025. No new policies for ground conditions identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: • EE3: Nature conservation; • Policy CC8: Pollution and land instability; and • Policy EE14: Minerals and waste restoration.	Ref. 37	Policy EE3 indicates that “...important habitats and sites of geological and geomorphological interest will be protected, maintained and enhanced” and that the “...assessment of adverse impacts will apply to potentially damaging development proposals that may affect the designated area”. Policy CC8 indicates that all proposals for new development must have regard to current national guidance as well as the Council’s Contaminated Land Strategy. The Plan also indicates that “...if the site is within a MSA, a Minerals Resource Assessment will be required”.

Guidance and Standards

14.2.6 Relevant guidance and standards which have been used as part of the scoping process and will also be taken into account as part of the EIA are listed below:

- a. Environment Agency's online guidance for the management of land contamination 'Land Contamination: Risk Management' (LCRM) (Ref. 38);
- b. British Standard (BS) 10175 (2011 +A2 2017), Investigation of Potentially Contaminated Sites – Code of Practice (Ref. 39);
- c. BS 5930 (2015 +A1:2020), Code of Practice for Ground Investigations. (Ref. 40);
- d. BS 8576 (2013), Guidance on Investigations for Ground Gas. Permanent Gases and Volatile Organic Compounds (VOCs) (Ref. 41);
- e. BS 8485 (2019), Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings (Ref. 42);
- f. Construction Industry Research and Information Association (CIRIA) C665, Assessing Risks Posed by Hazardous Ground Gases to Buildings, 2007 (Ref. 43);
- g. CIRIA C811, Environmental Good Practice on Site Guide (fifth edition), 2023 (Ref. 44);
- h. Environment Agency, Guidance Note on Piling/Penetrative Ground Improvement Methods on Land Affected by Contamination NC/99/73, 2001 (Ref. 45);
- i. Design Manual for Roads and Bridges (DMRB), LA109 Geology and Soils (2019) (Ref. 46);
- j. DMRB, LA104 Environmental Assessment and Monitoring (2020) (Ref. 47);
- k. DMRB, LA113 Road Drainage and the Water Environment (2020) (Ref. 48);
- l. Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater (Ref. 49);
- m. National House Building Council (NHBC), Environment Agency and Chartered Institute of Environmental Health (CIEH) report R&D66 'Guidance for the Safe Development of Housing on Land Affected by Contamination' (Ref. 50); and
- n. Contaminated Land: Applications in Real Environments (CL:AIRE) Framework for Assessing the Sustainability of Soil and Groundwater Remediation (2010) (Ref. 51).

14.3 Consultation

14.3.1 The following stakeholders will be consulted prior to completing the assessment as part of the EIA process:

- a. Environment Agency;
- b. Natural England;
- c. Local planning authorities;
- d. The Coal Authority; and
- e. Local geology groups (where relevant).

14.3.2 A summary of key topics raised during non-statutory consultation with regards to ground conditions is provided below:

- a. Further research into the geology in Mancetter; and
- b. Consideration of the protection of local residents from the proposed works, including any potential contamination.

14.3.3 These topics will be addressed accordingly in the next stage of EIA.

14.3.4 Furthermore, as part of the EIA process for PEIR and ES, consultation will be undertaken with the local planning authorities (as appropriate) to inform the assessment and mitigation for the Proposed Development.

14.4 Study Area

14.4.1 This section sets out the study areas adopted for the Proposed Development. Due to no works being proposed in Part 2 (Indicative Non-Working Areas), this has been excluded from the assessment.

14.4.2 Impacts from the Proposed Development on geological features, and MSA and MCA, will typically occur directly within the EIA Scoping Boundary where construction and operational activities would take place or interface directly with these receptors.

14.4.3 For the purposes of determining the wider geological context, geodiversity and to support the conceptual understanding of the ground model, the geology baseline will consider an extended 250 m study area from the EIA Scoping Boundary.

14.4.4 For the purposes of determining the local baseline conditions with respect to land contamination, a study area that also extends 250 m from the EIA Scoping Boundary will be adopted.

14.4.5 A 250 m study area will generally be used for hydrogeology. However, this study area will be extended to 1 km from the EIA Scoping Boundary in areas where there are higher permeability aquifers (e.g. Principal aquifers and SPZs). This is appropriate to assess the hydrogeological setting, and any influence that potential land contamination might have on the Proposed Development or local receptors (taking into consideration the pathways for contaminant migration). The study areas are presented in **Figure 14-1** in Volume 2 of the EIA Scoping Report.

14.5 Baseline Conditions

Existing Baseline

14.5.1 This section provides a summary of the baseline conditions in respect of ground conditions.

- 14.5.2 It has been necessary to divide some parts of the Proposed Development into further subsections in order to effectively characterise the baseline conditions. Reference should be made to the referenced figures in Volume 2 of this EIA Scoping Report for a visual representation.

Part 1a: Minworth AWTP

- 14.5.3 No further subsections are required for Part 1a. See **Figures 3-4** and **3-5** in Volume 2 of the EIA Scoping Report.

Part 1b: Minworth to Atherstone Pipeline

- 14.5.4 The Part 1b EIA Scoping Boundary is shown on **Figure 3-5** in Volume 2 of the EIA Scoping Report:
- a. **Figure 3-5, Sheet A:** Part 1B Minworth to Lea Marston;
 - b. **Figure 3-5, Sheet B:** Part 1B Lea Marston to Hurley; and
 - c. **Figure 3-5, Sheet C:** Part 1B Hurley to Atherstone (includes a Break Pressure Tank [BPT] shown on **Figure 3-6**).

Part 2: Works to the Coventry, Oxford and Grand Union Canals

- 14.5.5 The Part 2 EIA Scoping Boundary (Indicative Work Areas) is shown on **Figure 3-6** in Volume 2 of the EIA Scoping Report:
- a. **Figure 3-6, Sheet A:** Part 2A Coventry Canal – Atherstone to Nuneaton Road, Hartshill;
 - b. **Figure 3-6, Sheet B:** Part 2B Coventry Canal – Nuneaton Road, Hartshill to Chivers Rise, Nuneaton;
 - c. **Figure 3-6, Sheet D:** Part 2D Oxford Canal – Hawkesbury Pumping Station to Snow Common Sports Ground (also refer to **Figures 3-9, Sheets D-1 and D-2**);
 - d. **Figure 3-6, Sheet E:** Part 2E Oxford Canal – Snow Common Sports Ground to Nettle Hill, Ansty;
 - e. **Figure 3-6, Sheet F:** Part 2F Oxford Canal – Nettle Hill, Ansty to Cathiron Lane, Hungerford (also refer to **Figure 3-9, Sheet F-1**);
 - f. **Figure 3-6, Sheet G:** Part 2G Oxford Canal – Cathiron Lane, Hungerford to Newbold on Avon (also refer to **Figure 3-9, Sheet G-1**);
 - g. **Figure 3-6, Sheet H:** Part 2H-2I Oxford Canal – Hillmorton Pumping Station to Tarry's Bridge (also refer to **Figure 3-9, Sheet H-1**);
 - h. **Figure 3-6, Sheet K:** Part 2K-1 Oxford Canal – Braunston Pumping Station;
 - i. **Figure 3-6, Sheet L:** Part 2L Grand Union Canal – Norton Junction to Diamond Bridge (also refer to **Figure 3-9, Sheets L-1 and L-2**);
 - j. **Figure 3-6, Sheet M:** Part 2M Grand Union Canal – Diamond Bridge to Weedon Sewage Treatment Works;
 - k. **Figure 3-6, Sheet N:** Part 2N Grand Union Canal – Weedon Sewage Treatment Works to Camp Hill, Bugbrooke;
 - l. **Figure 3-6, Sheet O:** Part 2O Grand Union Canal – Camp Hill, Bugbrooke to Blisworth Junction;

- m. **Figure 3-6, Sheet P:** Part 2P Grand Union Canal – Blisworth Junction to Towcester;
- n. **Figure 3-6, Sheet Q:** Part 2Q Grand Union Canal – Stoke Bruerne Locks (also refer to **Figure 3-9, Sheet Q-1**);
- o. **Figure 3-6, Sheet S:** Part 2S Grand Union Canal – Cosgrove (also refer to **Figure 3-9, Sheet S-1**);
- p. **Figure 3-6, Sheet W:** Part 2W Grand Union Canal – Fenny Stratford Pumping Station (also refer to **Figure 3-9, Sheet W-1**);
- q. **Figure 3-6, Sheet X:** Part 2X Grand Union Canal – Stoke Hammond Pumping Station and Three Locks Pumping Station (also refer to **Figure 3-9, Sheets X-1 and X-2**);
- r. **Figure 3-6, Sheet Y:** Part 2Y Grand Union Canal – Leighton Pumping Station (also refer to **Figure 3-9, Sheet Y-1**); and
- s. **Figure 3-6, Sheet Z:** Part 2Z Grand Union Canal - Grove Lock and Church Lock pumping stations.

Part 3: Daventry and Drayton Reservoirs

- 14.5.6 No further subsections are required for Part 3. See **Figure 3-6, Sheet K** in Volume 2 of the EIA Scoping Report.

Part 4: Abstraction, Storage and Treatment and Pipeline to an Underground Reservoir near Luton

- 14.5.7 The Part 4 EIA Scoping Boundary is shown on **Figures 3-7** in Volume 2 of the EIA Scoping Report.

Geology

- 14.5.8 Publicly available sources have been reviewed, including the British Geological Survey (BGS) GeoIndex website (Ref. 52), and the Mining Remediation Authority Map Viewer (Ref. 53) to identify the ground conditions of the EIA Scoping Boundary (and 250 m study area).
- 14.5.9 Due to the complexity of the geology across the EIA Scoping Boundary, a summary table has been included in **Appendix 14-1: Description of Superficial and Bedrock Geology** in Volume 3 of the EIA Scoping Report, together with a summary of the BGS lexicon definitions provided.
- 14.5.10 For the purposes of this EIA Scoping Report chapter, the superficial and bedrock strata that outcrop at the surface, or in the case of bedrock, which subcrop beneath the superficial deposits (where present) have been identified. These are shown in **Figures 14-2** and **14-3** in Volume 2 of the EIA Scoping Report.
- 14.5.11 Note that the description within the 'Location' column covers the presence of the geological stratum both in the EIA Scoping Boundary and in the 250 m study area. Where the stratum is present only in the study area (not in the EIA Scoping Boundary), this is specified.
- 14.5.12 Where a geological stratum exists which is defined as a Principal Aquifer (see **Table 14-7**), the study area has been extended to 1 km.

14.5.13 The geological strata have been reported to 'formation' level. However, occasionally the 'member' level has been reported (in brackets) if there are different aquifer designations within that particular formation.

Geological Sites

14.5.14 Mapping available from online sources including Defra Magic Map (Ref. 54), the Local Development Plans detailed in Section 14.2, Local Geological Groups, and Council websites (Ref. 55, Ref. 57, Ref. 58, and Ref. 59) have been used to identify geological Sites of Special Scientific Interest (SSSI), Local Geological Sites (LGS) (previously referred to as Regionally Important Geological and Geomorphological Sites [RIGS]), and Geological Conservation Review sites (GCR) within the study area using publicly available information. Geological SSSI and LGS are detailed in **Table 14-3**. No GCR sites have been identified in the study area.

14.5.15 It should be noted that no information on LGS sites was found from publicly available information for West Northamptonshire.

14.5.16 No geological SSSI, LGS, RIGS or GCR sites were identified within Parts 1a, 1b, 3 or 4a.

14.5.17 Further stakeholder engagement with all local authorities and local geological groups will be undertaken to confirm and identify any additional geological sites across the EIA Scoping Boundary and study area.

Table 14-3: Geological sites within EIA Scoping Boundary and the study area

Part	Geological Site	Location
<i>Part 2: Works to the Coventry, Oxford and Grand Union Canals</i>		
Part 2A Coventry Canal – Atherstone to Nuneaton Road, Hartshill	Rawn Hill LGS (Ref. 55)	Slightly overlapping at Atherstone.
	Steppy Lane Section LGS (Ref. 55)	90 m west from the Part 2 EIA Scoping Boundary, south of Atherstone.
	Boon's Quarry SSSI (Ref. 54)	220 m south-east of the Part 2 EIA Scoping Boundary, north-east of Hartshill.
Part 2B Coventry Canal – Nuneaton Road, Hartshill to Chivers Rise, Nuneaton	Judkins Quarry LGS (Ref. 55 and Ref. 56)	90 m west, north-east of Nuneaton.
	Midland Quarry LGS (Ref. 55 and Ref. 56)	Adjacent, within Nuneaton.
	Stockingford Railway Cutting (Ref. 55 and Ref. 56)	240 m west, within Nuneaton.
Part 2H-2I Oxford Canal – Hillmorton Pumping Station to Tarry's Bridge	Royal Oak Gravel Pit & Cutting LGS (Ref. 55)	60 m east of the Part 2 EIA Scoping Boundary, south-east of Rugby.

Part	Geological Site	Location
Part 2Y Grand Union Canal – Leighton Pumping Station	Ouzel Valley LGS (Ref. 57)	60 m north of the Part 2 EIA Scoping Boundary, in Leighton Buzzard*.
Part 4b: Pipeline to Underground Reservoir near Luton		
SP5	Dunstable Downs & Whipsnade Downs LGS (Ref. 57)	Potentially overlapping the pipeline in the eastern-most extent*.
SP10	Overlap of Dunstable & Whipsnade Downs LGS (Ref. 57)	On-site in the central extent*.
	Kensworth Nature Reserve (Ref. 57)	South of Dunstable, potential overlap*.
	Kensworth Chalk Pit SSSI (Ref. 57)	South of Dunstable, potential overlap*.
	Landpark Quarry LGS (Ref. 57)	Potential overlap in the central extent*.
SP10A	Overlap of Dunstable & Whipsnade Downs LGS (Ref. 57)	On-site in the central extent*.
	Kensworth Chalk Pit SSSI (Ref. 57)	Potential overlap in the central extent*.
	Kensworth Nature Reserve (Ref. 57)	Potential overlap in the central extent*.

* Extent of the Geological Site needs clarifying with Bedfordshire Geology Group (as this is not indicated in the available plan)

Mineral Resources

14.5.18 Mapping available on the following plans has been used to identify MSA and MCA within the EIA Scoping Boundary:

- Adopted Warwickshire Minerals Local Plan 2018-2032 (Ref. 60);
- Northamptonshire County Council – Minerals and Waste Local Plan (Ref. 61);
- Milton Keynes Council – Minerals Local Plan (Ref. 62);
- Buckinghamshire Council Minerals and Waste Local Plan 2016-2036 (Ref. 63); and
- Bedford Borough Council, Central Bedfordshire Council and Luton Borough Council – Minerals and Waste Local Plan (adopted 2014) (Ref. 64).

14.5.19 Note that in some cases, it is difficult to interpret the publicly available mapping; therefore, further stakeholder engagement with all Local Authorities will be undertaken to confirm / identify the presence / absence of MSA and MCA across the EIA Scoping Boundary.

14.5.20 Policies maps and mineral plans for Birmingham City Council (Ref. 65) and Coventry City Council (Ref. 66) did not identify or list MSA or MCA within the EIA Scoping Boundary or study area.

Part 1a: Minworth AWTP

14.5.21 No MSA or MCA are indicated on the policies map for Birmingham City Council (Ref. 65) and therefore it is assumed that none are present within the EIA Scoping Boundary of Part 1a.

Part 1b: Minworth to Atherstone Pipeline

14.5.22 **Table 14-4** summarises the MSAs located within the EIA Scoping Boundary in Part 1b.

Table 14-4: Mineral Safeguarding Areas within Part 1b EIA Scoping Boundary

Authority	Commodity	Location
Warwickshire County Council	Crushed rock	Eastern-most extent.
	Unconsolidated sand and gravel	Predominantly in the western-most extent. Locally in the central portion of the area.
	Coal – shallow and deep	Deep coal in the majority of the central and eastern extent. Shallow coal localised in the eastern portion.
	Brick clay	Eastern and central extent of the area.
	Building stone	Majority of the central and eastern extent.

Part 2: Works to the Coventry, Oxford and Grand Union Canals

14.5.23 **Table 14-5** summarises the MSAs located within the Indicative Work Area in Part 2.

Table 14-5: Mineral Safeguarding Areas within Part 2 (Indicative Work Areas)

Authority	Commodity	Location
Warwickshire County Council	Crushed rock	Northern-most extent, from Atherstone to Nuneaton (Parts 2A and 2B).
	Unconsolidated sand and gravel	Majority of the Part 2 EIA Scoping Boundary from Atherstone to Rugby (Parts 2A to 2H, only locally in parts 2D and 2G).
	Coal – shallow and deep	Shallow coal south-east of Nuneaton and north-east of Coventry (south of Part 2B and north of Part 2D). Deep coal in northern-most portion of Part 2D.
	Brick clay	In close proximity or slightly overlapping the Part 2 EIA Scoping Boundary in northern portion of Part 2A and central / southern portion of Part 2B.

Authority	Commodity	Location
	Building stone	From Atherstone to Nuneaton (Overlapping majority of the Part 2 EIA Scoping Boundary in Parts 2A and 2B). North of Coventry (slightly overlapping northern-most portion of Part 2D), and north-west of Rugby (Part 2G).
	Cement raw materials	North-west of Rugby (Part 2G).
West Northamptonshire Council	Sand and gravel	From north-west of Daventry to the west of Northampton (Parts 2K to 2N). North-west of Milton Keynes (Part 2S).
Milton Keynes Council	Sand and gravel	South-east of Milton Keynes (Part 2W).
Buckinghamshire Council	Sand and gravel	North-west and south of Leighton Buzzard (Part 2X and 2Z).
Central Bedfordshire	Woburn Sands and Gault Clay	In Leighton Buzzard (North of Part 2Y and Part 2Z).

Part 3: Daventry and Drayton Reservoirs

14.5.24 The West Northamptonshire Council identifies an MSA for sand and gravel overlapping Part 3.

Part 4a: Abstraction, Storage and Treatment Works

14.5.25 Buckinghamshire Council indicates that MSAs for sand and gravel overlap both Site B and Site H.

Part 4b: Pipeline to Underground Reservoir near Luton

14.5.26 **Table 14-6** summarises the MSAs located within the Part 4b EIA Scoping Boundary in Part 4b.

Table 14-6: Mineral Safeguarding Areas within Part 4b EIA Scoping Boundary

Authority	Commodity	Location
Buckinghamshire Council	Sand and Gravel	Overlap on the northern-most extent of SP2. Overlap on the northern-most extent of SP2A. Overlap in the central and western extent of SP5. Overlap in the central and south-western extent of SP6.
Central Bedfordshire	Chalk	Overlap in the central extent of SP10. Overlap in the eastern extent of SP10A.
	Woburn Sands and Gault Clay MSA	Overlap in the central areas of SP2. Overlap in the southern extent of SP2A.

Authority	Commodity	Location
		Potential overlap in the southern-most and northmost extents of SP2B.

Hydrogeology

14.5.27 **Table 14-7** outlines the designations of the underlying aquifers within the study area for each part of the Proposed Development. As discussed in Section 14.4, a 250 m study area has been used for hydrogeology; where there are higher permeability aquifers (Principal aquifers and SPZ), this has been extended to 1 km from the EIA Scoping Boundary. Figures illustrating the BGS Superficial Aquifer Classifications are provided with **Chapter 22: Water Environment and Flood Risk (Figures 22-8, 22-19 and 22-32)**, and the BGS Bedrock Aquifer Classifications are provided with **Chapter 22: Water Environment and Flood Risk (Figures 22-7, 22-18 and 22-31)** in Volume 2 of the EIA Scoping Report.

14.5.28 Environment Agency definitions for the aquifer designations are listed as follows (Ref. 67):

- a. Principal aquifer: layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they “...provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands”;
- b. Secondary A: “...permeable layers that can support local water supplies, and in some cases forming an important source of base flow to rivers”;
- c. Secondary B: “...mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers”;
- d. Secondary undifferentiated: “...aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type”; and
- e. Unproductive strata: “...are largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them”.

Table 14-7: Aquifer designations

Geological Stratum	Aquifer Type	Part 1a	Part 1b	Part 2	Part 3	Part 4a, Site B	Part 4a, Site H	Part 4b
<i>Superficial Deposits:</i>								
River Terrace Deposits	Secondary A	✓	✓	✓		✓		
Alluvium	Secondary A	✓	✓	✓	✓	✓	✓	✓
Head	Secondary undifferentiated	✓	✓			✓		✓
Glaciolacustrine Deposits	Unproductive	✓	✓	✓				
Glaciofluvial Deposits	Secondary A	✓	✓	✓	✓			✓
Wolston Glaciogenic Formation	Secondary undifferentiated		✓					
Anker Sand and Gravel	Secondary A		✓	✓				
Wolston Formation (Oadby Member)	Secondary undifferentiated			✓	✓	✓	✓	✓
Wolston Formation	Secondary undifferentiated			✓				
Wolston Formation (Bosworth Clay Member)	Unproductive			✓				
Wolston Sand and Gravel	Secondary A			✓				
Hillmorton Sand	Secondary A			✓				
Peat	Unproductive			✓				
Dunsmore Gravel	Secondary A			✓				
Tufa	Secondary A			✓				
Unclassified Superficial Deposits	Secondary A			✓				
Clay-with-Flint	Unproductive							✓

Geological Stratum	Aquifer Type	Part 1a	Part 1b	Part 2	Part 3	Part 4a, Site B	Part 4a, Site H	Part 4b
<i>Bedrock Geology:</i>								
Sidmouth Mudstone Formation	Secondary B	✓	✓					
Halesowen Formation – Mudstone Siltstone And Sandstone	Secondary A		✓	✓				
Halesowen Formation – Limestone	Principal		✓	✓				
Halesowen Formation – Sandstone	Secondary A		✓					
Salop Formation	Principal		✓					
Pennine Middle And Lower Coal Measures Formations	Secondary A		✓	✓				
Millstone Grit Group	Secondary B		✓					
Merevale Shale Formation – Mudstone	Secondary B		✓					
Midlands Minor Intrusive Suite	Secondary B		✓	✓				
Monks Park Shale Formation	Secondary B		✓					
Moor Wood Sandstone Formation	Secondary B		✓					
Outwoods Shale Formation	Secondary B		✓	✓				
Mancetter Shale Formation	Secondary B		✓	✓				
Abbey Shale Formation	Secondary B		✓	✓				
Purley Shale Formation	Secondary B		✓	✓				
Helsby Sandstone Formation	Principal		✓	✓				
Gunthorpe Member	Secondary B			✓				
Mercia Mudstone Group - Mudstone, siltstone and sandstone	Secondary B			✓				
Mercia Mudstone Group - Mudstone and Siltstone	Secondary A			✓				
Hartshill Sandstone Formation	Secondary B			✓				

Geological Stratum	Aquifer Type	Part 1a	Part 1b	Part 2	Part 3	Part 4a, Site B	Part 4a, Site H	Part 4b
Caldecote Volcanic Formation	Secondary B			✓				
Unnamed Pluton, Neoproterozoic III	Secondary B			✓				
Etruria Formation	Secondary A			✓				
Blue Anchor Formation	Secondary B			✓				
Penarth Group	Secondary undifferentiated			✓				
Lilstock Formation	Secondary undifferentiated			✓				
Blue Lias Formation (Saltford Shale Member)	Secondary B			✓				
Blue Lias Formation (Rugby Limestone Member)	Secondary A			✓				
Charmouth Mudstone Formation	Secondary undifferentiated			✓	✓			
Dyrham Formation	Secondary undifferentiated			✓	✓			
Marlstone Rock Formation	Secondary A			✓	✓			
Whitby Mudstone Formation	Unproductive			✓	✓			
Northampton Sand Formation	Secondary A			✓				
Rutland Formation (Stamford Member)	Secondary A			✓				
Rutland Formation (Wellingborough Limestone Member)	Secondary A			✓				
Rutland Formation	Secondary B			✓				
Blisworth Limestone Formation	Principal			✓				
Blisworth Clay Formation	Unproductive			✓				
Cornbrash Formation	Secondary A			✓				

Geological Stratum	Aquifer Type	Part 1a	Part 1b	Part 2	Part 3	Part 4a, Site B	Part 4a, Site H	Part 4b
Kellaways Formation	Secondary A			✓				
Oxford Clay Formation	Unproductive			✓		✓		
West Walton Formation	Unproductive			✓		✓		✓
Woburn Sands Formation	Principal			✓		✓*		✓
Gault Formation	Unproductive			✓			✓	✓
Upper Greensand Formation	Principal							✓
West Melbury Marly Chalk Formation	Principal							✓
Zig Zag Chalk Formation	Principal							✓
Holywell Nodular chalk Formation	Principal							✓
Holywell Nodular chalk Formation and New Pit Chalk Formation	Principal							✓
Gault Formation and Upper Greensand (undifferentiated)	Unproductive							✓
West Melbury Marly Chalk Formation and Zig Zag Chalk Formation (undifferentiated)	Principal							✓
Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated)	Principal							✓
New Pit Formation	Principal							✓*

* Within the extended 1 km study area.

Key: ✓ = present in Part.

Source Protection Zones

14.5.29 MAGIC Map (Ref. 54) have been used to identify SPZ within the EIA Scoping Boundary and 1 km study area. Figures illustrating the SPZ are provided with **Chapter 22: Water Environment and Flood Risk (Figures 22-7, 22-8, 22-18, 22-19, 22-31 and 22-32** in Volume 2 of the EIA Scoping Report).

Part 1a: Minworth AWTP

14.5.30 No SPZ located within 1 km of the Part 1a EIA Scoping Boundary.

Part 1b: Minworth to Atherstone Pipeline

14.5.31 No SPZ located within 1 km of the Part 1b EIA Scoping Boundary.

Part 2: Works to the Coventry, Oxford and Grand Union Canals

14.5.32 An SPZ is located approximately 490 m east of Part 2Y Grand Union Canal – Leighton Pumping Station. This is a Zone III – Total Catchment. The closest Zone I – Inner Protection Zone is located approximately 3.9 km north-east.

14.5.33 There are no other SPZ located within 1 km of the Part 2 EIA Scoping Boundary.

Part 3: Daventry and Drayton Reservoirs

14.5.34 No SPZ located within 1 km of the Part 3 EIA Scoping Boundary.

Part 4a: Abstraction & Treatment Works

14.5.35 No SPZ located within 1 km of the Part 4a EIA Scoping Boundary.

Part 4b: Pipeline to Underground Reservoir near Luton

14.5.36 A number of SPZ were identified in the Part 4b EIA Scoping Boundary. These are summarised in **Table 14-8**. No SPZ are mapped within the study area of pipelines SP6 and SP7.

Table 14-8: SPZ – Part 4b: Pipeline to Underground Reservoir near Luton

Pipeline	Location, extent ¹ and type of SPZ
SP2	Present on-site (25%) and off-site in the study area (25%) in the central area and northern area. Zone I and II: north-eastern area of SP2 and study area (north-east of Heath and Reach). Zone III: northern and central extent of SP2 and study area.
SP2A	Present on-site (60%) and off-site in the Study area (70%). Zone I and Zone II: eastern-most extent of SP2A and study area (north-east of Heath and Reach). Zone III: central and eastern extent of SP2A and study area.
SP2B	Zone I present in the central area of SP2B, on-site (1%) and off-site in the study area (5%).

¹ Coverage across each pipeline and study area are given as an approximate percentage (%)

Pipeline	Location, extent ¹ and type of SPZ
SP5	Zone I, II and III present in the eastern extent of the study area (<5%). (100 m south).
SP6	None present.
SP7	None present.
SP10	Present across eastern part of SP10 and study area (60%). Zone I: central area and easternmost extent of the Part 4b EIA Scoping Boundary and study area. Zone II: central area of SP10, easternmost extent of SP10 and study area, and two areas in the eastern extent of the study area (70 m south and 530 m north). Zone III: eastern half of SP10 and study area.
SP10A	Present on-site (30%) and Study area (40%). Zone I: slightly overlapping SP10A, extending west in the study area. Zone II: north-eastern extent of study area (570 m north-east) and slightly overlapping easternmost extent of SP10A. Zone III: Eastern extent of SP10A and study area.
SP10B	Present across the entire SP10B and study area. Zone I: easternmost extent of SP10B and study area. Zone II: eastern extent of SP10B and study area, and south-western extent of study area (405 m south-west). Zone III: whole of the SP10B and study area.
SP10C	Present across the entire SP10C and study area. Zone I: northern extent of SP10C and study area. Zone II: whole of SP10C and study area. Zone III: whole of SP10C and study area.

Surface Water Features

14.5.37 A number of surface water features have been identified in the study area. These are summarised in **Table 14-9 to Table 14-14**.

Table 14-9: Surface waterbodies – Part 1a: Minworth AWTP

Surface Water Feature	Location
Unnamed ponds and streams	On-site and off-site in the study area.
Tame – River Rea to River Blythe	180 m south at its closest point.
Birmingham and Fazeley Canal upper section	60 m north at its closest point.

Table 14-10: Surface waterbodies – Part 1b: Minworth to Atherstone Pipeline

Surface Water Feature	Location
Unnamed ponds and streams	On-site and off-site in the study area.
Tame – River Rea to River Blythe	250 m south at its closest point.

Surface Water Feature	Location
Tame from River Blythe to River Anker	Crossing the Part 1b EIA Scoping Boundary at Lea Marston.
Dog Lane Brook from Source to River Tame	Crossing the Part 1b EIA Scoping Boundary north of Nether Whitacre.
Merevale Lake	In the study area, 90 m north, south-west of Atherstone.
Coventry and Ashby Canals	Eastern-most extent.
Innage Brook	In the study area north of the eastern-most extent.

Table 14-11: Surface waterbodies – Part 2: Works to the Coventry, Oxford and Grand Union Canals

Surface Water Feature	Location
Unnamed ponds and streams	On-site and off-site in the study area.
Coventry and Ashby Canals	On-site along the Part 2 EIA Scoping Boundary (Parts 2A, 2B and 2D).
Innage Brook	In the study area north of Part 2A.
North Oxford Canal	On-site, along the Part 2 EIA Scoping Boundary (Parts 2D, 2F, 2G and 2H).
Bar Pool Brook	On-site, tributary of Coventry Canal. North-west of Nuneaton (Part 2B).
Wyken Pool	On-site, north-east of Coventry (Part 2D).
Wyken Basin	On-site, north-east of Coventry (Part 2D).
Smite Brook – source to conf River Sowe	Crossing the Part 2 EIA Scoping Boundary (Part 2F).
Brinklow Marina	On-site, south-east of Brinklow (Parts 2F and 2G).
Avon – Claycoton Yelvertoft Brook to conf River Sowe	120 m south, north-west of Rugby (Part 2G).
Clifton Brook – source to conf River Avon	Crossing the Part 2 EIA Scoping Boundary south-east of Rugby (Part 2H).
Grand Union Canal, Braunston to Leamington Spa	On-site, along the Part 2 EIA Scoping Boundary (Parts 2H, 2K).
Rains Brook – source to conf River Leam	200 m south-east (Part 2H).
Drayton Reservoir	140 m south-east (Part 2K).
Grand Union Canal, Braunston summit	On-site, along the Part 2 EIA Scoping Boundary (Parts 2K, 2L).
Welton Village Tributary, Whilton branch of River Nene	Crossing the Part 2 EIA Scoping Boundary north-east of Daventry (Part 2K); 80 m north-west within the study area of Part 2L.
Grand Union Canal, Milton Keynes to Braunston summit	On-site, along the Part 2 EIA Scoping Boundary (Parts 2L, 2M, 2N, 2O, 2P, 2Q, 2S).
Wilton Branch – Lower	30 m east at its closest point (Part 2L, 2M, 2N).

Surface Water Feature	Location
Nene – headwaters to conf Whilton Branch	Crossing the Part 2 EIA Scoping Boundary at Weedon Bec (Part 2M).
Nene – conf Whilton Branch to conf Brampton Branch	140 m north, east of Weedon Bec (Part 2M and 2N).
Luddle Brook	Crossing the Part 2 EIA Scoping Boundary east of Nether Heyford (Part 2N).
Bugbrooke	Crossing the Part 2 EIA Scoping Boundary south-west of Bugbrooke (Part 2N).
Heyford Fields Marina	On-site of the Part 2 EIA Scoping Boundary, west of Bugbrooke (Part 2N).
Bugbrooke Marina	On-site of the Part 2 EIA Scoping Boundary, south-west of Bugbrooke (Part 2N).
Gayton Marina	On-site of the Part 2 EIA Scoping Boundary, east of Gayton (Part 2O).
Blisworth Marina	On-site of the Part 2 EIA Scoping Boundary, east of Gayton (Part 2O).
Tove (DS Greens Norton)	140 m southwest, north-east of Alderton (Part 2Q).
Grand Union Canal, Milton Keynes Trough Pound	On-site, along the Part 2 EIA Scoping Boundary (Part 2S and 2W).
Potterspury Brook	120 m south-east, North of Stony Stratford)Part 2S).
Grand Union Canal, Tring summit to Milton Keynes	On-site, along the Part 2 EIA Scoping Boundary (Parts 2W, 2X, 2Y, and 2Z).
Ouzel US Caldecote Mill	On-site (Parts 2X and 2Y), generally parallel to the Part 2 EIA Scoping Boundary (within the study area) (Part 2W).
Ouzel (US Clipstone Brook)	On-site, south of Leighton Buzzard (Part 2Z).
Ledburn Brook	On-site, south of Leighton Buzzard (Part 2Z).

Table 14-12: Surface waterbodies – Part 3: Daventry and Drayton Reservoirs

Surface Water Feature	Location
Daventry Reservoir	On-site.
Drayton Reservoir	On-site.
Unnamed ponds and streams	Off-site, in the study area.
Grand Union Canal, Braunston summit	60 m north.
Grand Union Canal, Braunston to Leamington Spa	30 m north.
Welton Village Tributary, Whilton branch of River Nene	On-site.

Table 14-13: Surface waterbodies – Part 4a: Abstraction, Storage and Treatment Works

Surface Water Feature	Location
Ouzel and Milton Keynes and tributary	On-site, Site B.
Grand Union Canal, Tring summit to Milton Keynes	Adjacent to the west, Site B; adjacent to the south of Site H.
Unnamed streams and ponds	In the study area of Site B and H.

Table 14-14: Surface waterbodies – Part 4b: Pipeline to Underground Reservoir near Luton

Surface Water Feature	Location
Unnamed streams and ponds	On-site and off-site, throughout Part 4b EIA Scoping Boundary.
Clipstone Brook	On-site (SP2, SP2B).
Clipstone Brook Tributary	On-site (SP2, SP2B).
Ouzel Brook	On-site (SP2, SP6, SP7).
Whistle Brook	On-site (SP5, SP6).
Ouzel (US Clipstone Brook)	On-site (SP6).
Eaton Bray Brook	On-site (SP6).

Ecological Sensitive Sites

14.5.38 The following ecological sensitive sites have been identified in the study area. Further details on ecological sites are included in **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial**.

14.5.39 No Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Nature Reserves, or Ramsar sites have been identified.

14.5.40 No ecological sites have been identified within 250 m from the Part 1a EIA Scoping Boundary and the Part 4a EIA Scoping Boundary.

14.5.41 Geological sites have been identified and discussed previously in this chapter and are not repeated here.

Table 14-15: Ecological sites in the study area

Part	Ecological Site	Location
Part 1b: Minworth to Atherstone Pipeline	Whitacre Heath SSSI	Adjacent south-east, south-west of Lea Marston.
	Drybrooks Wood Ancient Woodland	20 m south, in between Hurley and Baxterley.
	Dunton Coppice Ancient Woodland	Adjacent to the Part 1b EIA Scoping Boundary, to the north-west of Lea Marston.
	Bentley Park Wood SSSI and Ancient Woodland	Adjacent south, south-east of Atherstone.

Part	Ecological Site	Location
	Gallops Hill Wood Ancient Woodland	Bordering the EIA Scoping Boundary, to the west of Atherstone.
	Holly Thicks Ancient Woodland	Immediately to the north of the Part 1b EIA Scoping Boundary, to the west of Atherstone.
	Quarres Wood South	250 m south-east, near Atherstone.
	Unnamed Ancient Woodland	250 m south-east, near Atherstone.
Part 2: Works to the Coventry, Oxford and Grand Union Canals	Boon's Quarry SSSI	220 m west (Part 2A).
	Unnamed Ancient Woodland	160 m east (Part 2A and 2B).
	Wyken Slough LNR	On-site (Part 2D).
	Newbold Quarry Country Park and LNR	250 m south, north of Rugby (Part 2G).
	Purley Park Ancient Woodland	130 m west, south of Atherstone (Part 2A).
	Spring Wood Ancient Woodland	150 m east, north of Nuneaton (Part 2B).
	All Oaks Wood Ancient Woodland	20 m south, south of Hungerfield (Part F).
Part 3: Daventry and Drayton Reservoirs	Daventry Country Park and LNR	On-site.
Part 4b: Pipeline to Underground Reservoir near Luton	Unnamed Ancient Woodland	150 m north (SP2A), and adjacent south (SP2), north-east of Great Brickhill
	Bragenham Wood Ancient Woodland	Adjacent to the south, east of Great Brickhill (SP2 and 2A)
	Bushycommon Wood Ancient Woodland	100 m north-east, east of Great Brickhill (SP2 and 2A)
	Unnamed Ancient Woodland	150 m north, east of Great Brickhill (SP2)
	Sallowspring Wood Ancient Woodland	40 m south, east of Edlesborough (SP10)
	Unnamed Ancient Woodland	Adjacent north, north-east of Whipsnade (SP10 and 10A)
	Unnamed Ancient Woodlands	From 50 m north, south-west of Chaul End (SP10 and 10B)
	Badgerdell Wood	Adjacent, south-east of Chaul End (SP10 and 10C)
	Unnamed Ancient Woodland	On-site and adjacent, south-east of Chaul End (SP10 and 10C)

Part	Ecological Site	Location
	Dunstable Downs Country Park	On-site (SP10A) and 100 m north-east (SP10), east of Edlesborough (SP10A)
	Cottage Bottom Fields LNR	On-site (SP10 and SP10A) and 200 m north-east (SP10B), south-west of Chaul End
	King's Wood and Rushmere NNR	Adjacent (SP2A) and 150 m south-west of Great Brickhill
	Kings and Bakers Wood and Heaths SSSI	Adjacent (SP2A) and 150 m south-west of Great Brickhill
	Dunstable and Whipsnade Downs SSSI	Two areas: Adjacent to the north and 50 m south (SP10A), east of Edlesborough 50 m south (SP5, SP10 and 10A), east of Edlesborough
	Kensworth Chalk Pit SSSI	Adjacent to the north (SP10 and 10A), north-east of Whipsnade
	Dallow Downs and Winsdon Hill	60 m east (SP10C) and 200 m north-east (SP10), in Luton

Land Contamination

14.5.42 The current use of the EIA Scoping Boundary and study area has been evaluated using OS mapping and current and historical landfill mapping. Figures illustrating landfill sites are provided with **Chapter 21: Materials and Waste** (see **Figure 21-1** in Volume 2 of the EIA Scoping Report).

14.5.43 Historical land use also has the potential to have caused a legacy of contamination which may pose a risk to the Proposed Development or surrounding sensitive receptors during construction and operation.

14.5.44 There are very limited resources available to determine historical land use. Only historical landfill mapping has been used to determine the potential for historical sources of contamination at scoping stage.

14.5.45 Further detailed current and historical land use reviews will be undertaken as part of planned Phase 1 reporting for the EIA Scoping Boundary (see Section 14.7 for further details).

Table 14-16: Current land uses and current and historical landfills (potential sources of contamination)

Part / Subsection	Land Use Feature	Location
Part 1a: Minworth AWTP		
Part 1a: Minworth AWTP	Authorised landfill site: <i>Minworth Landfill, Minworth Sewage Treatment Works.</i>	Overlapping into the west and adjacent to the south of Part 1a EIA Scoping Boundary.

Part / Subsection	Land Use Feature	Location
	Sewage works.	Structures adjacent to the Part 1a EIA Scoping Boundary; tanks mostly in the north-west.
Part 1b: Minworth to Atherstone Pipeline		
Part 1B- Minworth to Lea Marston	Authorised landfill site: <i>Landfill Development Co Ltd - Dunton Quarry</i>	170 m west of the western extent, south-east of M42 Junction 1.
	Historic landfill sites:	
	<i>Land West Of Hams Lane</i>	Overlapping Part 1B, west of Lea Marston.
	<i>Woodhouse Farm</i>	50 m east of the western extent.
	<i>CEGB Site No.2</i>	Overlapping the central area, north of Lea Marston.
	<i>Land East Of Hams Lane.</i>	150 m south of the central area, south-west of Lea Marston.
	<i>River Tame Purification Lake</i>	120 m north of the central area, north of Lea Marston.
	<i>ARC Lea Marston</i>	250 m north of the central area, north of Lea Marston.
	Railway line.	Crosses Part 1B east of Lea Marston. Trends in a north-east to south-west direction.
	<i>Birmingham Road</i>	Overlapping Part 1B in the eastern area, east of Lea Marston.
	<i>Birmingham Road</i>	30 m south of the eastern extent, south of Birmingham Road.
Part 1B- Lea Marston to Hurley	Historic landfill sites:	
	<i>Coton Hall Quarry No.3</i>	160 m north-west of western extent, north of Whitacre Heath.
	<i>West of Coton Road</i>	50 m east of western extent, north-west of Whitacre Heath.
	<i>Coton Quarry</i>	90 m east of western extent, north-west of Whitacre Heath.
	<i>Coton Hall Quarry No.3</i>	170 m north-west, east of Marston.

Part / Subsection	Land Use Feature	Location
	<i>Coton Hall Quarry No.2</i>	Overlapping into western area, south of Coventry Road.
	<i>Coton Hall Quarry</i>	90 m west of western area, west of Coventry Road.
Part 1B- Hurley to Atherstone	Historic landfill site: <i>Outwoods Golf Club</i>	Overlapping into eastern-most extent, south-west of Atherstone.
Part 2: Works to the Coventry, Oxford and Grand Union Canals		
Part 2A Coventry Canal – Atherstone to Nuneaton Road, Hartshill	Railway line	50 m north-east at its closest point.
	Historic landfill sites:	
	<i>Outwoods Golf Club</i>	250 m west, south-west of Atherstone
	<i>Worthington Farm</i>	Adjacent to the west, slightly overlapping the Part 2 EIA Scoping Boundary, south of Mancetter.
	<i>Stoneleigh Quarry Farm</i>	Overlapping the Part 2 EIA Scoping Boundary, south of Mancetter.
	<i>Stoneleigh Quarry</i>	Overlapping the Part 2 EIA Scoping Boundary, south of Mancetter.
	<i>Clockhill Landfill Site</i>	230 m south, north of Hartshill.
	Industrial area	Adjacent to the west, north-west of Hartshill.
	Industrial area	Adjacent to the south-west, north of Nuneaton.
Part 2B Coventry Canal – Nuneaton Road, Hartshill to Chivers Rise, Nuneaton	Authorised landfill site. <i>Judkins Landfill Phase 3 (Crown Waste Limited).</i>	Overlapping and extending to the west, north-west of Nuneaton.
	Authorised landfill site. <i>Judkins Landfill Site (Waste Recycling Group).</i>	100 m west and extending, north-west of Nuneaton.
	Railway line	Crossing the Part 2 EIA Scoping Boundary north-west of Nuneaton city centre.
	Historic landfill site: <i>Vernons Lane Playing Fields</i>	Slightly overlapping, north-west of Nuneaton city centre.

Part / Subsection	Land Use Feature	Location
	Industrial estate including several Permitted Waste Sites	Adjacent to the east, north-west of Nuneaton city centre.
Part 2D Oxford Canal – Hawkesbury Pumping Station to Snow Common Sports Ground	Historic landfill sites:	
	<i>Parkers</i>	170 m west, north-east of Hawkesbury.
	<i>Hawkesbury Colliery Farm; potential historical colliery</i>	180 m west, north-east of Hawkesbury.
	<i>Hawkesbury Hall Farm</i>	60 m east, north-east of Hawkesbury.
	<i>Hawkesbury Landfill and Hawkesbury Landfill Sites</i>	Overlapping the northern-most section.
	<i>Blackhorse Road</i>	Multiple sites slightly overlapping to the west, east of Hawkesbury.
	<i>Hawkesbury Colliery Farm</i>	Adjacent north-west, within Hawkesbury.
	<i>Hawkesbury Power Station</i>	Slightly overlapping, east of Hawkesbury.
	<i>Hawkesbury Farm</i>	150 m east, east of Hawkesbury.
	<i>Hawkesbury Power Station</i>	Slightly overlapping, south-east of Hawkesbury.
	<i>Lentons Lane</i>	90 m north-east, south of Hawkesbury.
Part 2E Oxford Canal – Snow Common Sports Ground to Nettle Hill, Ansty	Railway line	Adjacent to the east west of Ansty.
Part 2F Oxford Canal – Nettle Hill, Ansty to Cathiron Lane, Hungerfield	Railway line	Adjacent to the north-east north of Brinklow, crossing the Part 2 EIA Scoping Boundary north-west of Rugby.
Part 2G Oxford Canal – Cathiron Lane, Hungerfield to Newbold on Avon	Historic landfill site: <i>All Oaks Lane</i>	Overlapping, in proximity of Brinklow Marina.
Part 2H – 2I Oxford Canal – Hillmorton Pumping Station to Tarry's Bridge	Historic landfill site: <i>Hillmorton Sidings</i>	140 m east, within Hillmorton.
	Railway line	Crossing the Part 2 EIA Scoping Boundary at Hillmorton.

Part / Subsection	Land Use Feature	Location
Part 2K-1 Oxford Canal – Braunston Pumping Station	None identified.	None identified.
Part 2L Grand Union Canal – Norton Junction to Diamond Bridge	Historic landfill sites:	
	<i>Whilton Lodge</i>	140 m south, east of Norton.
	<i>Hall Farm (Barton Plant Limited)</i>	160 m west, east of Norton.
	<i>North Field Farm</i>	50 m west, south-east of Norton.
	Railway line	Crossing the Part 2 EIA Scoping Boundary at Long Buckby Wharf.
Part 2M Grand Union Canal – Diamond Bridge to Weedon Sewage Treatment Works	Historic landfill sites:	
	<i>Dodford Landfill</i>	30 m north-east, north of Weedon Bec.
	<i>Dodford Farm and Dodford</i>	Slightly overlapping, north of Weedon Bec.
	<i>Dodmoor Farm</i>	Overlapping, north of Weedon Bec.
	Railway line	Parallel and adjacent to the west.
Part 2N Grand Union Canal – Weedon Sewage Treatment Works to Camp Hill, Bugbrooke	Railway line	Adjacent to the south at its closest point, south-south of Bugbrooke.
Part 2O Grand Union Canal – Camp Hill, Bugbrooke to Blisworth Junction	Historic landfill sites:	
	<i>Old Brickyard</i>	Adjacent north-west, north of Gayton.
	<i>Gayton Landfill Site</i>	Overlapping, north-east of Gayton.
	<i>Milton Sand Pit</i>	Overlapping west of Milton Malsor.
	<i>Rothersthorpe</i>	Overlapping, west of Milton Malsor.
	<i>Gayton Road</i>	200 m east, west of Milton Malsor.
	Authorised landfill site: <i>Milton Malsor Landfill</i>	70 m north-east, west of Milton Malsor.
	Railway line	Crossing the Part 2 EIA Scoping Boundary north of Blisworth.
Part 2P Grand Union Canal – Blisworth Junction to Towcester	Railway line	Crossing the Part 2 EIA Scoping Boundary north of Blisworth.

Part / Subsection	Land Use Feature	Location
	Historic landfill site: <i>Tunnel Hill Farm</i>	50 m south, south of Blisworth.
Part 2S Grand Union Canal – Cosgrove	Historic landfill site: <i>Stratford Road</i>	180 m west, north of Old Stratford.
	Farms	Across the study area.
Part 2W Grand Union Canal – Fenny Stratford Pumping Station	Historic landfill site: <i>Former Canal Dredging Tip Fenny Stratfor</i>	120 m south, within Bletchley.
Part 2Y Grand Union Canal – Leighton Pumping Station	Historic landfill sites:	
	<i>Vimy Road</i>	110 m south-east, within Leighton Buzzard.
	<i>Rear Of Blackpot Farm</i>	70 m east, within Leighton Buzzard.
Part 2Z Grand Union Canal - Grove Lock and Church Lock pumping stations	Authorised Landfill: <i>Cemex UK Materials Ltd (Ledburn Landfill)</i>	70 m north, south of Leighton Buzzard
	Historic landfill sites:	
	<i>Tiddenfoot</i>	40 m north, south of Leighton Buzzard.
	<i>Grovebury Quarry</i>	Overlapping, south of Leighton Buzzard.
	<i>Grovebury Farm</i>	200 m north-east, south of Leighton Buzzard.
	<i>Brickyard Quarry</i>	210 m north-east, south of Leighton Buzzard.
	<i>Quarry Grovebury Road</i>	60 m east, south of Leighton Buzzard.
Part 3: Daventry and Drayton Reservoirs		
Part 3: Daventry and Drayton Reservoirs	Historic landfill sites:	
	<i>Drayton Fields Farm</i>	80 m south-west.
	<i>Ashby Road</i>	Overlapping, within Daventry.
	<i>Daventry Sewage Works</i>	On-site, south of Daventry Reservoir.
Part 4a: Abstraction, Storage and Treatment Works		
Part 4a - Site B	Allotments	40 m north-west.
	Vehicle wrapping facility	Adjacent to the east.
	Marina	15 m west.
	Vehicle repair	15 m west.
	Car dealership	80 m south-west of the western-most spur.

Part / Subsection	Land Use Feature	Location
	Car wash	90 m south-west of the western-most spur of the Site.
Part 4b: Pipeline to Underground Reservoir near Luton		
SP2	Historic landfill sites:	
	<i>Sand Quarry Inert and industrial 1974 - not specified</i>	On-site and off-site (northern area).
	<i>Fox and Hounds Sandpit inert 1964 - not specified</i>	30 m west of the northern extent.
	<i>Sandhouse Quarry Industrial and commercial. 1970 - 1977</i>	130 m west of the northern extent.
	<i>Sand Quarry. Inert and industrial. Input dates not specified.</i>	130 m west of the northern extent.
	Roadways	On-site, majority of the pipeline.
	Car dealership	On-site, central extent.
	Vehicle repair shop	Off-site, central extent.
	Unspecified light industrial activities, car repair shop	Off-site, southern extent.
	Transport company	Off-site, southern extent.
	Potential sewage works	On-site, southern extent.
SP2A	Historic landfill sites:	
	<i>Fox and Hounds Sandpit. Inert. 1964 - not specified.</i>	On-site in the southern extent.
	<i>Rammamere Farm.</i>	220 m south of the southern extent.
	<i>Sandhouse Quarry. industrial and commercial. 1970 – 1977.</i>	160 m south of the southern extent.
	Roadways	In the southern extent.
SP2B	Roadways	Northern extent.
	Car dealership	On-site, northern extent.

Part / Subsection	Land Use Feature	Location
SP5	Historic landfill sites:	
	<i>Shepherds Farm.</i>	Adjacent in the eastern extent.
	<i>Disused Chalk Pit. Inert. 1991 – 1993.</i>	310 m south-east of the eastern extent.
SP10	Historic landfill sites:	
	<i>Shepherds Farm</i>	On-site in the central area.
SP10A	Historic landfill sites:	
	<i>Shepherds Farm</i>	On-site for a limited extent and off-site (western extent).
	Quarry	Off-site in the eastern extent.

14.5.46 In addition to the sources set out in **Table 14-16**, the following potential sources of contamination are expected to be present along the EIA Scoping Boundary:

- a. Made Ground;
- b. Farms and associated farming land; and
- c. Historic and active dredging tip sites may be present (particularly along Part 2), many of which are bankside to sections of waterways and have been used for historic dredgings disposal, some of which contain elevated contaminants.

Summary of Sensitive Receptors

14.5.47 In terms of sensitive receptors surrounding the EIA Scoping Boundary, these can be divided into controlled waters, human health, development infrastructure and ecological / geological designated sites:

- a. Controlled waters receptors include:
 - i. Surface water features (including those listed in **Table 14-9** to **Table 14-13**;
 - ii. Groundwater aquifers including Principal, Secondary A, Secondary B and Secondary (undifferentiated) superficial and bedrock aquifers (see **Table 14-7**);
 - iii. SPZs;
- b. Human health receptors including:
 - i. Nearby residents (including permanent (residential, leisure and trade) moorings), commercial and industrial workers;
 - ii. Future site staff and maintenance workers;
 - iii. Construction and maintenance workers undertaking the site works.
- c. Future and current development infrastructure, including foundations, pipelines and services;

- d. Geological sites including those listed in **Table 14-3**; and
- e. Ecological sensitive sites including those listed in **Table 14-15**.

Future Baseline

- 14.5.48 This section considers any changes to the baseline conditions that might occur over the lifespan of the Proposed Development.
- 14.5.49 The ground conditions are unlikely to be altered over time without a significant change of land use.
- 14.5.50 With respect to land contamination, any future development within the study area is subject to the requirements of relevant planning policies, as summarised within Section 14.2 of this chapter. This requires consideration of the potential for contamination to be present. The developer would be required to carry out remediation to ensure the development is suitable for its proposed use.
- 14.5.51 Furthermore, natural attenuation processes have the potential to mitigate risks over time from any existing sources of contaminants present within soil and groundwater.
- 14.5.52 Changes in groundwater abstractions could affect the groundwater flow regime and climate change could influence the future baseline conditions, due to changes on the rainfall regime, recharge, groundwater levels and flow. However, these changes are long-term and are not predictable at this stage.

14.6 Potential Effects

Construction Phase

- 14.6.1 The scoping of potential effects from the Proposed Development during the construction phase are presented within **Table 14-17** below.

Table 14-17: Potential effects during the construction phase – Ground Conditions

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Geology / Geological Designated Sites: Damage, disturbance or removal of geological features of interest (geological SSSI, LGS, RIGS and GCR).	In	All ²	<u>Effects on geology and geological designated sites</u> There is potential for disturbance of geological features of interest (permanent adverse effects), and these are therefore scoped in to the assessment.
Mineral Resources: Temporary mineral severance or sterilisation.	In	All ³	<u>Effects on MSA and MCA</u> There may be some adverse effects during the construction period to the identified MSA / MCA (through temporary severance / sterilisation).
Mobilisation and migration of existing potential sources of contamination, due to: • Ground disturbance during earthworks, excavations, trenching and other techniques; • Open excavations; • Uncovered stockpiles; and	In	All	<u>Effects on groundwater</u> Direct effects on the aquifers associated with the superficial deposits and any potential groundwater abstractions may occur due to the intrusive nature of earthworks, trenching, trenchless construction, tunnelling (and associated shafts) and piling (as required). The significance of the disturbance would be dependent on the depth of the aquifer unit in relation to the proposed depth of the intrusive works and the nature of any potential contaminated soil or groundwater in the area.

² Further stakeholder engagement with all local authorities and local geological groups is proposed to confirm and identify any additional geological sites across the EIA Scoping Boundary and study area.

³ Note that in some cases, it is difficult to interpret the publicly available mapping; therefore, it is proposed that further stakeholder engagement with all Local Authorities is undertaken to confirm and identify the presence or absence of MSA and MCA within the EIA Scoping Boundary.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
• Dewatering. Historical and current land use has the potential to have caused a legacy of contamination which may pose a risk to the receptors within and in proximity of the EIA Scoping Boundary during construction. The current use of the EIA Scoping Boundary and study areas has been evaluated using OS mapping. Recorded authorised and historical landfill boundaries have also been identified. This information is collated in Table 14-16.			Direct effects on the aquifers and SPZ associated with the bedrock geology and any potential groundwater abstractions may occur from deep ground workings associated with trenchless construction, tunnelling (and associated shafts) or piling (as required). There is potential for contaminants to migrate along newly created preferential pathways which could cause a deterioration of groundwater quality. Surface layers would be excavated allowing increased infiltration of rainwater and surface run-off which could potentially mobilise existing sources of contamination and create new pathways. Potential for contaminants in unsaturated soils to be exposed to surface water run-off and to leach to groundwater in open excavations. Potential impacts from migration of contaminants from uncovered stockpiles to groundwater receptors.
	In	All	<u>Effects on surface water and ecological and geological sites</u> Creation of preferential pathways for the migration of soil contamination via groundwater, installation of temporary drainage, surface water run-off and uncovered stockpiles. Ecological and geological receptors, including features of designated sites that are sensitive to nitrogen or acid deposition, may be impacted by significant increases in dust.
	In	All	<u>Effects on human health (adjacent and/or nearby users)</u> Potential temporary adverse impacts to nearby residents (including permanent (residential, leisure and trade) moorings) and commercial workers from excavation works, and the movement and stockpiling of

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			soils. These impacts are more likely in areas where contamination may be encountered. Construction works may alter migration pathways or create new preferential pathways that did not previously exist between a source and receptor. This could result in impacts to human health through dermal contact, inhalation (inclusive of vapours and ground gases) and ingestion of contaminants.
	Out	All	<u>Effects on human health (construction and maintenance workers)</u> Impacts on human health from contamination within unsaturated soil (dust and fine particulate matter) and groundwater. There may be some temporary adverse effects during the construction period due to the introduction of human health receptors (construction workers). However, these receptors will be protected by health and safety legislation and mitigation (e.g. identified through health and safety risk assessment prior to work commencing) and are therefore scoped out. The Proposed Development will be undertaken in compliance with Construction Design and Management (CDM) 2015 Regulations (Ref. 16). Prior to work commencing, a health and safety risk assessment would be undertaken by the appointed Principal Contractor and developed in accordance with current health and safety regulations. The health and safety risk assessment would cover potential risks to human health for construction workers. Based on the findings, appropriate mitigation measures would be implemented during the construction phase, such as the use of Personal Protective Equipment (PPE). These standard measures for the environmental management of the Proposed Development will be set out within the CoCP.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Introduction of new sources of contamination, such as fuels, oils and other fluids used in construction plant.	In	All	<u>Effects on controlled waters and ecological and geological sites</u> These impacts are temporary in nature given the approach to construction. The potential impacts will likely be mitigated by the embedded and good practice measures; mitigation measures dealing with the risk of accidental spills or contaminants will be incorporated, with risks managed through the implementation of industry standard best practice guidelines, for example, appropriate use of chemicals, spill response and pollution contingency plans, careful design of horizontal directional drilling (HDD) arcs, minimum clearance from river beds. Effects on controlled waters receptors will be considered within Chapter 22: Water Environment and Flood Risk and, therefore, will not be repeated in the ground conditions assessment. Effects on ecological sites will be considered within Chapter 12: Ecology – Aquatic and Chapter 13: Ecology – Terrestrial and therefore, will not be repeated within the ground conditions assessment. Effects on geological sites, however, will be considered within the ground conditions chapter. Potential effects on controlled waters receptors and ecological / geological sites as a result of the introduction of new sources of contamination will be considered further within the ground conditions chapter.
	In	All	<u>Effects on human health (adjacent and nearby users)</u> These potential impacts are temporary in nature given the approach to construction. The potential impacts will likely be mitigated by the embedded and good practice measures; mitigation measures dealing with the risk of accidental spills or contaminants will be suggested, with risks managed through the implementation of industry standard

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			best practice guidelines, for example, appropriate use of chemicals, spill response, dust suppression, and pollution contingency plans. Potential effects on human health as a result of the introduction of new sources of contamination will be considered further within the ground conditions chapter.
Land contamination (from existing potential sources of contamination located within the EIA Scoping Boundary): Any contamination removed, remediated, or mitigated leading to removal of contaminant sources from the source – pathway – receptor linkage	In	All	<u>Effects on all receptors</u> May result in potential beneficial impacts on human health, controlled waters, property receptors and ecological receptors. There may be some permanent beneficial effects post-construction phase due to the removal of contaminant sources during construction works.
Ground stability	In	All	The Applicant is confident that any potential for ground stability issues to arise during the construction phase will be adequately mitigated through detailed geotechnical desk studies, a GIR and GDR which will be undertaken as part of the ongoing design process. A summary of the available information will be included in the ES chapter.

Operational Phase

14.6.2 The scoping of potential effects from the Proposed Development during the operational phase are presented within **Table 14-18** below.

Table 14-18: Potential effects during the operational phase – Ground Conditions

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Indirect and direct impacts to identified receptors (e.g. human health and controlled waters) may occur as a result of the disturbance of ground for maintenance works and leakage / spillages of stored materials during the operational phase / pollutants bypassing the drainage system (e.g. spills).	Out	All	Impacts to human health and controlled waters caused by land contamination are considered unlikely as maintenance and operation of the Proposed Development will be in accordance with good practice. Any unacceptable risk from contaminated land would have been addressed by remediation during construction stage. Any required environmental permit(s) for the Proposed Development will control operational discharges as appropriate.
Mineral Resources: Permanent mineral severance or sterilisation.	In	All ⁴	<u>Effects on MSA and MCA</u> There may be permanent adverse effects during the operational period to the identified MSA and MCA (through permanent severance / sterilisation).
Ground stability	In	All	The Applicant is confident that any potential for ground stability issues to arise during the operational phase will be adequately mitigated through detailed geotechnical desk studies, a GIR and GDR which will be undertaken as part of the ongoing design process. A summary of the available information will be included in the ES chapter.

⁴ Note that in some cases, it is difficult to interpret the publicly available mapping; therefore, it is proposed that further stakeholder engagement with all local authorities is undertaken to confirm / identify the presence / absence of MSA and MCA across the EIA Scoping Boundary.

14.7 Approach to Assessment

Establishing Baseline Conditions

- 14.7.1 A Phase 1 desk-based assessment (equivalent to a Stage 1, Tier 1 assessment as defined under LCRM [Ref. 38]) will be completed for the Proposed Development to identify and provide an assessment of any potential hazards and constraints to the Proposed Development deriving from the ground conditions, including the potential for land contamination, an outline of the ground hazards and a preliminary risk from unexploded ordnance (UXO)⁵.
- 14.7.2 A site walkover will also be completed within key, high-risk areas, and a summary provided. The Phase 1 desk-based assessment will include a ground model based on available geological and hydrogeological information. This will inform a preliminary Conceptual Site Model (CSM) that will identify the potential for land contamination and potential contaminant pathways to impact sensitive receptors and consider the mobilisation of contaminants associated with current and historical land use in and around the Proposed Development.
- 14.7.3 The results of the desk-based assessment and preliminary CSM will be used to assess data gaps and uncertainties and, if required, develop an initial scope for site investigation in order to quantitatively assess the levels of contamination across the Proposed Development. Ground investigation would be intended to support the development of the design, confirm the ground model and also to quantitatively assess any potential land contamination risk to the Proposed Development. This tiered approach to assessment is consistent with the Environment Agency's LCRM guidance (Ref. 38). It is anticipated that the requirements for any intrusive investigation will be discussed and agreed in advance with the Environment Agency and relevant local planning authorities.

Assessment Methodology

Geology and Minerals Impact Assessment Methodology

- 14.7.4 The likely significance of effects of the construction and operational stages to geology and mineral resources will be assessed based on the sensitivity or importance of the resource and the magnitude of potential impact.

Contaminated Land Impact Assessment Methodology

- 14.7.5 The approach to assessing the potential impacts of the Proposed Development from, and to land contamination, will be undertaken following a risk-based approach which is consistent with LCRM (Ref. 38). The assessment will be based on comparing the risk levels at baseline via the preliminary CSM (developed in the Phase 1 desk-based assessment) and the assessed risk levels for the construction and operational stages respectively, to evaluate the change in risk at each stage. Potential risks are

⁵ The preliminary risk will not conclude the risk level but will advise on required further research.

evaluated and assessed based on the likelihood (or probability) and consequence using the principles given in the NHBC, CIEH and Environment Agency's report R&D66 (Ref. 50) and LCRM (Ref. 38). This provides guidance on development and application of the consequence and probability matrix to risk assessment and broad definitions of consequence and is widely used for a range of developments.

- 14.7.6 The significance of the effects of land contamination is assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and operation stages. Where there is shown to be a decrease in contamination risk, the Proposed Development is assessed as having a beneficial effect on the environment. Reference will be made to DMRB LA109 (Ref. 46), LA104 (Ref. 47), LA113 (Ref. 48) and CIEEM (Ref. 49), which although applicable to road schemes, is considered to provide a suitable framework within which to conduct EIA for ground conditions on schemes which include linear elements (including the Proposed Development).
- 14.7.7 **Table 14-16** indicates potential sources of contamination that have been identified within the EIA Scoping Boundary and the study area.
- 14.7.8 Section 14.5, paragraph 14.5.47 summarises the sensitive receptors surrounding the EIA Scoping Boundary.
- 14.7.9 The following potential pathways are considered to be present:
- Direct contact, dermal absorption or ingestion of contaminated soil;
 - Inhalation of soil particulates derived from soils and inhalation of soil vapour derived from soils and groundwater;
 - Migration of hazardous gases and vapours via permeable strata into confined spaces (asphyxiation and explosion);
 - Leaching of chemicals and vertical migration via permeable unsaturated strata to the shallow aquifer and vertical migration of impacted shallow groundwater to the deeper aquifer;
 - Spillage, loss or run-off from surface water to receiving water features;
 - Lateral migration of impacted shallow groundwater towards surface water baseflow;
 - Lateral migration of impacted groundwater towards SPZs;
 - Migration via underground utilities to surface water; and
 - Contact of services and concrete with contaminated soils and aggressive ground conditions.

Hydrogeological Assessment

- 14.7.10 The initial hydrogeological baseline and proposed scope of assessment of potential impacts from the Proposed Development on groundwater is provided in **Chapter 22: Water Environment and Flood Risk**. At this stage, a qualitative impact assessment is proposed based on a source-pathway-receptor approach. This will consider the pollution risk to groundwater during construction and operation of the Proposed Development, as well as potential impacts on groundwater levels and flows from any excavations that

may be required. Potential impacts on Groundwater Dependent Terrestrial Ecosystems (GWDTE), groundwater abstractions and any associated Source Protection Zones, and WFD groundwater bodies will also be considered, where relevant. The scope of assessment will be kept under review as additional scheme information becomes available.

Assessment Criteria

- 14.7.11 Definitions of magnitude of impact, sensitivity or importance of the receptor and significance of effect that will be used as part of the EIA are reported in the following section.

Sensitivity of Receptors

- 14.7.12 The criteria for assessing receptor sensitivity are defined in **Table 14-19** and is in general accordance with the DMRB LA109 (Ref. 46), LA113 (Ref. 48) and CIEEM (Ref. 49).

Table 14-19: Receptor sensitivity

Sensitivity / value	Description / criteria
High	Geology • Very rare and of international importance with no potential for replacement (e.g. United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites, UNESCO Global Geoparks, SSSI and GCR sites where citations indicate features of international importance). • Geology meeting international designation citation criteria which is not designated as such. Mineral resources* • Presence of significant mineral reserves and within a Mineral Buffer Zone or Safeguarding Area. Contamination <u>Human health:</u> • Very high sensitivity land use such as residential or allotments. <u>Surface water:</u> • Watercourse having a WFD classification shown in a River Basin Management Plan (RBMP) and $Q95 \geq 1.0 \text{ m}^3/\text{s}$. <u>Groundwater:</u> • Principal aquifer providing a regionally important resource and / or supporting a site protected and UK legislation for Ecology and Nature Conservation. • Groundwater locally supports GWDTE. • SPZ 1. <u>Ecology and Nature Conservation.</u> • Sites of international importance (e.g. SAC, SPA, Ramsar site, salmonid water) or of high sensitivity.
Medium	Geology • Rare and of national importance with little potential for replacement (e.g. geological SSSI, National Nature Reserves [NNR]). • Geology meeting national designation citation criteria which is not designated as such. Mineral resources* • Within a Mineral Consultation or Safeguarding Area.

Sensitivity / value	Description / criteria
	<i>Contamination</i> <u>Human health:</u> • High sensitivity land use such as public open space. <u>Surface water:</u> • Watercourse having a WFD classification shown in a RBMP and Q95 <1.0 m³/s. <u>Groundwater:</u> • Principal aquifer providing locally important resource or supporting a river ecosystem. • Groundwater supports a GWDTE. • SPZ 2. <u>Ecology and Nature Conservation.</u> • Sites of national importance (e.g. SSSIs, National Nature Reserves) or of medium sensitivity.
Low	<i>Geology</i> • Of regional importance with limited potential for replacement (e.g. RIGS). • Geology meeting regional designation criteria which is not designated as such. <i>Mineral resources*</i> • Some mineral potential but not within a Mineral Consultation or Safeguarding Area. <i>Contamination</i> <u>Human health:</u> • Medium sensitivity land use such as commercial or industrial. <u>Surface water:</u> • Watercourses not having a WFD classification shown in a RBMP and Q95 >0.001 m³/s. <u>Groundwater:</u> • Aquifer providing water for agricultural or industrial use with limited connection to surface water. • SPZ 3. <u>Ecology and Nature Conservation.</u> • Sites of local importance (e.g. Local Wildlife Sites, Local Nature Reserves) or of low sensitivity.
Very low	<i>Geology</i>

Sensitivity / value	Description / criteria
	• Of local importance / little or low interest with potential for replacement (e.g. non-designated geological exposures, former quarries / mining sites). Mineral resources* • Limited potential for mineral reserves and site not within a Mineral Consultation or Safeguarding Zone. Contamination <u>Human health:</u> • Low sensitivity land use such as highways and rail. <u>Surface water:</u> • Watercourses not having a WFD classification shown in a RBMP and Q95 ≤ 0.001 m³/s. <u>Groundwater:</u> • Unproductive strata. <u>Ecology and Nature Conservation.</u> • Land with very low sensitivity and / or no designations.

* Sensitivity of mineral receptors is not described as part of the referenced DMRB guidance. Therefore, professional judgement has been used.

Magnitude of Impacts

14.7.13 The magnitude of impact or how considerable the change to ground conditions is in comparison to the baseline conditions as a result of the construction and operation of the Proposed Development is classified as either being:

- a. High adverse or beneficial;
- b. Medium adverse or beneficial;
- c. Low adverse or beneficial; and
- d. Very low adverse or beneficial.

14.7.14 The criteria and their respective magnitude of impact classification which has been applied are presented within **Table 14-20** and based on the DMRB LA109 (Ref. 46), LA113 (Ref. 48), and CIEEM (Ref. 49).

Table 14-20: Magnitude of impact and descriptions

Magnitude of Impact	Definition	Demonstrated in the construction and operation CSM as risk level changes defined as follows
High	<i>Geology and Mineral Resources</i> Loss of geological feature / designation and / or quality and integrity, severe damage to key characteristics, features, or elements.	N/A.
	<i>Contamination</i> 1) human health: significant contamination identified. Contamination levels significantly exceed background levels and relevant screening criteria (category 4 screening levels) within SP1010 (Ref. 68) with potential for significant harm to human health. Contamination heavily restricts future use of land; 2) surface water: refer to sensitivity criteria in LA113; 3) groundwater: refer to sensitivity criteria in LA113; and 4) ecological sites: refer to impact descriptions in CIEEM.	<u>High adverse:</u> An increase in contamination risk of 4 or 5 risk levels in the risk matrix, e.g. land that has a very low contamination risk in the baseline becoming a high or very high risk. <u>High beneficial:</u> A reduction in contamination risk of 4 or 5 risk levels in the risk matrix, e.g. land that has a very high contamination risk in the baseline becomes a low or very low risk.
Medium	<i>Geology and Mineral Resources</i> Partial loss of geological feature / designation, potentially adversely affecting the integrity; partial loss of / damage to key characteristics, features, or elements.	N/A.
	<i>Contamination</i> 1) human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (category 4 screening levels) in SP1010. Significant contamination can be present. Control and remediation measures are required to reduce risks to human health and make land suitable for intended use; 2) surface water: refer to sensitivity criteria in LA113; 3) groundwater: refer to sensitivity criteria in LA113; and	<u>Medium adverse:</u> An increase in contamination risk of 2 or 3 risk levels in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate or high risk. <u>Medium beneficial:</u> A reduction in contamination risk of 2 or 3 levels in the risk matrix, e.g. land that has a high

Magnitude of Impact	Definition	Demonstrated in the construction and operation CSM as risk level changes defined as follows
	4) ecological sites: refer to impact descriptions in CIEEM.	contamination risk in the baseline becomes a moderate / low or low risk.
Low	<i>Geology and Mineral Resources</i> Minor measurable change in geological feature and designation attributes, quality, or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features, or elements.	Not applicable.
	<i>Contamination</i> 1) human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (category 4 screening levels) in SP1010. Significant contamination can be present. Control and remediation measures are required to reduce risks to human health / make land suitable for intended use; 2) surface water: refer to sensitivity criteria in LA113; 3) groundwater: refer to sensitivity criteria in LA113; and 4) ecological sites: refer to impact descriptions in CIEEM.	<u>Low adverse:</u> An increase in contamination risk of 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate / low risk. <u>Low beneficial:</u> A reduction in contamination risk of 1 risk level in the risk matrix, e.g. land that has a moderate / low contamination risk in the baseline becomes a low risk.
Very low	<i>Geology and Mineral Resources</i> Minor measurable change in geological feature and designation attributes, quality, or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features, or elements.	N/A.
	<i>Contamination</i> 1) human health: contaminant concentrations substantially below levels outlined in relevant screening criteria (category 4 screening levels) in SP1010. No requirement for control measures to reduce risks to human health and make land suitable for intended use; 2) surface water: refer to sensitivity criteria in LA113; 3) groundwater: refer to sensitivity criteria in LA113; and	<u>Very low adverse:</u> An increase in contamination risk of none or 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate / low risk, but only slightly worse. <u>Very low beneficial:</u> A reduction in contamination risk of none or 1 risk level in the risk matrix, e.g. land that has a moderate /

Magnitude of Impact	Definition	Demonstrated in the construction and operation CSM as risk level changes defined as follows
	4) ecological sites: refer to impact descriptions in CIEEM.	low contamination risk in the baseline becomes a low risk, but only slightly better.

Assessment of Effects and Level of Significance

14.7.15 The classification and likely significance of the effect resulting from the magnitude of impact and receptor sensitivity will be evaluated in accordance with the matrix shown in **Table 14-21**.

Table 14-21: Classification of effects

Magnitude	Value and sensitivity of receptor			
	Very Low	Low	Medium	High
Very Low	Negligible	Negligible	Minor	Minor
Low	Negligible	Minor	Minor	Moderate
Medium	Minor	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

14.7.16 Major effects are considered significant; moderate effects can be significant, or not significant, based on specific scenarios and/or professional judgement; and minor and negligible effects are considered not significant.

14.8 Assumptions, Limitations, and Uncertainties

- 14.8.1 The construction phase will include enabling works required to facilitate the Proposed Development. The assessment will assume that during the construction phase, excavation, earthworks or cutting may be required anywhere within the EIA Scoping Boundary ('worst-case' situation).
- 14.8.2 This EIA Scoping Report chapter is based on the collation and evaluation of readily available third-party information, including information from the Environment Agency, the BGS, and other data sources made available. This information will be reviewed and updated as part of the EIA process.
- 14.8.3 The assessment should be read in light of the legislation, statutory requirements and / or industry good practice applicable at the time of the assessment. Any subsequent changes in this legislation, guidance or design may necessitate the findings to be reassessed in the light of these circumstances.

14.9 Approach to Mitigation

- 14.9.1 Based on the assessment of the baseline conditions and the identification of any potential impacts, commitments to mitigation measures will be made, where relevant, in the ES.
- 14.9.2 Embedded mitigation for ground conditions will likely include:
- Avoidance of known sources of contamination, environmentally sensitive areas, groundwater and surface water abstractions, and historical and active landfills where practicable;
 - Important geological features or resources will be considered within the design of the Proposed Development and avoided (where practicable).
- 14.9.3 The following good practice measures are also anticipated:

- a. Incorporate good site practice and management through the construction phase via adherence to a Code of Construction Practice (CoCP), to be submitted with the DCO application. This will include a requirement for the preparation of a Pollution Prevention Response Plan and mitigation measures to be employed by contractors, should any previously unidentified contamination be encountered during the construction phase. For example, in the event that unacceptable risks are identified or encountered during construction, and routing through these areas is unavoidable, remedial measures will be implemented.
 - b. An Environmental Permit will be required to operate the Proposed Development and control releases to land and water (see **Chapter 7: Other Assessments** for further information); and
 - c. Appropriate mitigation measures in relation to hydrogeological receptors will be identified in **Chapter 22: Water Environment and Flood Risk**, which may include measures such as an appropriate dewatering scheme to be developed prior to construction to demonstrate that there is an effective strategy to manage water arising from the construction operations and, where required, sufficient proposals to treat the water prior to controlled discharge.
- 14.9.4 In addition to the above, it is anticipated that any intrusive ground investigation (GI) additional to design-related GI (to address any residual data gaps or better delineate identified potential contaminant linkages), quantitative risk assessment, remediation and validation, would be undertaken post-DCO consent, and secured via the DCO. An initial scope for site investigation will be developed in order to quantitatively assess the levels of contamination within relevant / key areas of the EIA Scoping Boundary.
- 14.9.5 The Applicant will engage with and consult stakeholders on proposed mitigation measures throughout the EIA process and present a consultation summary in the ES.

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Chapter 15: Human Health

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15. Human Health

15.1 Introduction

- 15.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on human health. This chapter has been informed by an overview of the environmental baseline conditions, along with the anticipated potential impacts likely to be associated with the Proposed Development.
- 15.1.2 This chapter considers potential impacts of the Proposed Development on the health and wellbeing of the population in relation to the following health determinants derived from the Institute of Environmental Management and Assessment (IEMA) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (EIA) (Ref. 1):
- a. Healthcare and other social infrastructure;
 - b. Open space, play and leisure;
 - c. Transport modes, access and connections;
 - d. Economic environment (employment and income, education and training opportunities);
 - e. Air quality;
 - f. Noise and vibration;
 - g. Landscape and visual amenity;
 - h. Water quality and availability;
 - i. Climate change mitigation and adaptation.
 - j. Health-related behaviours: physical activity; risk taking behaviour; diet and nutrition;
 - k. Social environment: housing; relocation; community safety; community identity; culture, resilience and influence; social participation, interaction and support;
 - l. Bio-physical environment: radiation; and
 - m. Institutional and built environment: built environment; wider societal infrastructure and resources.
- 15.1.3 This chapter should be read in conjunction with the following chapters of this EIA Scoping Report:
- a. **Chapter 9: Air Quality and Odour;**
 - b. **Chapter 10: Climate;**
 - c. **Chapter 14: Ground Conditions;**
 - d. **Chapter 16: Landscape and Visual;**
 - e. **Chapter 18: Noise and Vibration;**
 - f. **Chapter 19: Socio Economics;**

- g. **Chapter 20: Traffic and Transport;** and
- h. **Chapter 22: Water Environment and Flood Risk.**

15.2 Legislation, Planning Policy Context, and Guidance

- 15.2.1 Legislation, planning policy and guidance relevant to the scope and method of assessment of impacts on human health is outlined below.

Legislation

- 15.2.2 The applicable legislation includes:
- a. The Infrastructure Planning (EIA) Regulations 2017 (Ref. 2) ('the EIA Regulations'); and
 - b. Health and Care Act 2022 (Ref. 3).
- 15.2.3 The above legislation has informed the human health assessment methodology described within Section 15.1.

National Policies, Plans and Strategies

- 15.2.4 The relevant national policies, plans and strategies for human health are summarised within **Table 15-1** below. These documents have informed the assessment methodology.

Table 15-1: National policies, plans and strategies – Human health

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 4)	Section 3.12 Health, paragraphs 3.12.1 to 3.12.4 set out requirements for applicants to consider human health impacts.	The NPSWRI informs the human health assessment methodology.
National Planning Policy Framework (NPPF) (Ref. 5)	- Paragraph 8: There are three overarching objectives in achieving sustainable development, one of which is...<i>“a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities’ health, social and cultural well-being”</i>; and - Paragraph 96: <i>“Planning policies and decisions should aim to achieve healthy, inclusive and safe places which promote social interaction... are safe and accessible... and that enable and support health lifestyles”</i>.	The NPPF informs the human health assessment, emphasising the need to support the creation and enhancement of healthy places and communities.
NHS Long Term Plan 2019 (Ref. 6)	There are no specific requirements set out in the NHS Long Term Plan; however, it emphasises the need to reduce health inequalities through wider preventative action in deprived areas.	The objectives of the NHS Long Term Plan inform the human health assessment.
Spatial Planning for Health: An evidence resource for planning and designing healthier places (Ref. 7)	Neighbourhood design: <i>“Neighbourhoods are places where people live, work, and play and have a sense of belonging. The design of a neighbourhood can contribute to the health and well-being of the people living there. Several aspects of neighbourhood design (walkability</i>	The Spatial Planning for Health resource informs the human health assessment methodology, setting out principles which planners should follow to ensure that places become healthier.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	<i>and mixed land use) can also maximise opportunities for social engagement and active travel. Neighbourhood design can impact on our day-to-day decisions and therefore have a significant role in shaping our health behaviours”; and</i> • Natural and sustainable environment: <i>“there is a very significant and strong body of evidence linking contact and exposure to the natural environment with improved health and wellbeing. For the purpose of this review, the natural and sustainable environment is comprised of neighbourhood ecosystems and the resulting co-benefits between the environment and health. Protecting the natural environment is essential to sustaining human civilization”.</i>	
Public Health England ¹ : Strategy 2020 to 2025 (Ref. 8)	Public Health England Strategy 2020 to 2025 emphasises the importance of planning in healthy communities and references the Spatial Planning and Health document (Ref. 8) described above in providing an evidence base for this.	The objectives of the Public Health England Strategy 2020 to 2025 inform the human health assessment.

¹ Public Health England was superseded by UK Health Security Agency in 2021.

Local Policy

- 15.2.5 The local policies listed in **Table 15-2** are considered both relevant to the scope and method of assessment of potential human health impacts presented in this chapter.

Table 15-2: List of relevant local policy – Human health

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • Policy TP7 Green infrastructure network. • Policy TP9 Open space, playing fields and allotments. • Policy TP37 Health. • Policy TP39 Walking. • Policy TP40 Cycling.	Ref. 9	Policy TP7 – emphasises the need to maintain and expand a green infrastructure network throughout Birmingham. Policy TP9 – emphasises the need for assessments to consider open space. Policy TP37 – emphasises the City Council's commitment to reducing health inequalities, increasing life expectancy and improving quality of life. Policy TP39 – emphasises the need to promote pleasant walking environments. Policy TP40 – emphasises the need to support cycling infrastructure and accessible cycling opportunities.
	New Local Plan for Birmingham 2042: • Policy HN12 Healthy neighbourhoods. • Policy CE9 Green infrastructure and nature recovery. • Policy CE13 Open space. • Policy CY2 Active travel.	Ref. 10	Policy H12 – seeks to improve air quality, safety, design out crime, and encourage social interaction as part of planning for healthy neighbourhoods. Policy CE9 - seeks to extend and improve green infrastructure networks. Policy CE13 – outlines the Council's guidance for developments that impact upon open spaces. Policy CY2 – seeks to provide safe and pleasant walking environments and encourage cycling.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • LP17 Green Infrastructure. • LP20 Green Space. • LP22 Open Spaces and Recreational Provision.	Ref. 11	LP17 – states development proposals must contribute to maintaining and enhancing the green infrastructure network. LP20 – outlines that existing green spaces are to be retained, protected and wherever possible enhanced.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	LP27 Walking and Cycling.		LP22 – states the importance of open spaces and how they should be retained, where possible. LP27 – states that developments should consider what improvements can be made to encourage safe and fully accessible walking and cycling.
Warwickshire County Council	Council Plan 2022-2027: Seven areas of focus: Support people to live healthy, happy, and independent lives and work with partners to reduce health inequalities.	Ref. 12	This will be achieved by acting on the wider determinants of health, ensuring sustainable access to services and targeting action to the most vulnerable groups.
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: - Policy HS4 Retaining community facilities - Policy HS5 Health. - Policy NE1 Green Infrastructure. - Policy NE2 Open space. - Policy DS1 Presumption in favour of sustainable development.	Ref. 13	Policy HS4 – notes that developments should not lead to the loss of community facilities. Policy HS5 – states development proposals are required to demonstrate that they would have an acceptable impact on health and wellbeing through a Health Impact Assessment (HIA) or a screening report. Policy NE1 – outlines that development proposals should create new, and enhance existing, green infrastructure assets. Policy NE2 – sets out actions applicants should consider in relation to open space. Policy DS1 - emphasises the importance of proposals contributing to positive changes in economic, social and environmental conditions.
	Borough Plan Review 2021-2039 Policy HS4 Retaining Community Facilities.	Ref. 14	Policy HS4 – outlines the Council's requirements for developments that impact upon community facilities. Policy HS5 – states development proposals are required to demonstrate that they would have an acceptable

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy HS5 Health. - Policy NE1 Green and blue infrastructure. - Policy NE2 Open Space.		impact on health and wellbeing through an HIA or screening report. Policy NE1 – states development proposals should enhance, sustain and restore existing and create green and blue infrastructure (including canals). Policy NE2 - outlines the importance of open spaces and the importance of retaining them.
Coventry City Council	Coventry Local Plan (2011-2031): - Policy HW1 Health Impact Assessments (HIA). - Policy GE1 Green Infrastructure. - Policy AC4 Walking and Cycling.	Ref. 15	Policy HW1 – states development proposals are required to demonstrate that they would have an acceptable impact on health and wellbeing through a HIA or screening report. Policy GE1 – sets out the Council's commitment to protecting green infrastructure. Policy AC4 – states development proposals should consider the needs of pedestrians and the existing pedestrian route network.
	Local Plan Review: Issues and Options Consultation (2023) - Policy HW1 Health Impact Assessments. - Policy DS3 Sustainable Development Policy.	Ref. 16	Policy HW1 – outlines the need to strengthen Policy HW1 to reflect the Council's priority to ensure all residents can lead a healthy lifestyle regardless of where they live. Policy DS3 – outlines the need to update the policy to reflect the priorities of the One Coventry Plan and of the emerging Climate Change Strategy.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: - Policy HS1 Healthy, Safe and Inclusive Communities. - Policy HS2 Health Impact Assessments.	Ref. 17	Policy HS1 – emphasises importance of developments to consider creating healthy, safe and inclusive communities. Policy HS2 – emphasises the importance of HIAs for understanding the potential impacts upon wellbeing.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Rugby Borough Local Plan review – issues and options consultation (2023)	Ref. 18	The Rugby Borough Local Plan Review outlines potential changes to the Rugby Borough Local Plan due to changes in national policy.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1	Ref. 19	The West Northamptonshire Joint Core Strategy Part 1 identifies specific locations for strategic employment and changes to transport infrastructure and supporting community facilities.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: Policy ENV4 Green Infrastructure.	Ref. 20	Policy ENV4 – sets out the Council's aim to protect, enhance and restore the District's green infrastructure assets.
	New Local Plan for West Northamptonshire 2041 - Policy PL9 Health and Wellbeing – Health Impact Assessments. - Policy PL11 - Community and Sport Facilities, Open Space and Allotments. - Policy TR1 Sustainable Transport.	Ref. 21	Policy PL9 – states that development proposals will need to demonstrate that they will contribute to creating an age friendly, healthy and equitable living environment through an HIA. Policy PL11 – outlines the importance of open space and community facility receptors and the need to protect them. Policy TR1 – states that proposals should ensure that the development is designed to encourage walking, wheeling and cycling to community facilities and open spaces.
Milton Keynes City Council	Plan: MK 2016 – 2031: - Policy EH7 – Promoting Healthy Communities. - Policy L2 – Protection of Open Space and Existing Facilities.	Ref. 22	Policy EH7 – emphasises the Council's commitment to reducing health inequalities, increasing life expectancy and improving quality of life. Policy L2 – sets out that proposals for development resulting in a loss of open space or facilities is likely to be refused.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	New City Plan: Ambition and Objectives Consultation 2023	Ref. 23	The consultation outlines objectives to be covered in the New City Plan, with reference to economic growth and the protection of open space.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: Policy I1 Green infrastructure.	Ref. 24	Policy I1 – sets out the Council's support for proposals where there is no significant adverse impact on green infrastructure.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives	Ref. 25	The Draft Vision and Objectives document sets out eight objectives for Buckinghamshire to achieve by 2040, including for economy and jobs; infrastructure; and natural and built environment.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: - Policy EE1: Green Infrastructure. - Policy EE11: The River and Waterway Network.	Ref. 26	Policy EE1 – states development proposals must demonstrate a net gain in green infrastructure. Policy EE11 – sets out the Council's agenda for developments adjacent to the waterway network.

Guidance and Standards

- 15.2.6 Relevant guidance and standards which have been used as part of the EIA scoping process and will also be taken into account as part of the EIA include:
- a. Planning Practice Guidance (PPG) on Open space, sports and recreation facilities, public rights of way and local green space (Ref. 27), Healthy and safe communities (Ref. 28) and Plan-making (Ref. 29)
 - b. IEMA Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (Ref. 1); and
 - c. IEMA Determining Significance for Human Health in EIA Guidance (Ref. 30).

15.3 Consultation

- 15.3.1 During non-statutory consultation, the following human health related matters were raised and will be considered as part of the scope of assessment:
- a. Potential impact on human health and mental wellbeing as a result of impacts on open space, play and leisure amenities;
 - b. Potential impacts on human health as a result of changes to the water quality in the canal;
 - c. Potential impacts on human health and mental wellbeing as a result of impacts on residential properties, including moorings;
 - d. Potential impacts on human health and mental wellbeing as a result of construction noise, vibration and dust during construction on the local community;
 - e. Potential impacts during construction on healthcare and other social infrastructure; and
 - f. Potential construction impacts on human health and mental wellbeing as a result of changes to the local road network, access and connections.
- 15.3.2 Future consultation with relevant local NHS Integrated Care Boards (ICB) is proposed as part of the preparation of the human health assessment to inform the understanding of the relevant considerations within the health profile of communities along the route.

15.4 Study Area

- 15.4.1 The study area for human health varies depending on the effect or type of resource being assessed.
- 15.4.2 At present, a wide definition of the spatial area for consideration for the health assessment applies. This includes the EIA Scoping Boundary, along with the surrounding areas based on administrative boundaries to align with how the Government publishes official data and with the boundaries of health service planning areas, which are typically at district / unitary level.

15.4.3 The study area also reflects those defined by other environmental aspects relevant to human health, namely air quality and odour, climate, landscape and visual amenity, noise and vibration, socio-economics, traffic and transport and water environment and flood risk. For the purposes of the baseline conditions section of this chapter, the local authorities areas through which the Proposed Development is aligned are regarded as 'the study area', and the data for this area is compared to England as a whole. The study area is comprised of the following local authorities:

- a. Birmingham City Council;
- b. Coventry City Council;
- c. North Warwickshire Borough Council;
- d. Nuneaton and Bedworth Borough Council;
- e. Rugby Borough Council;
- f. Buckinghamshire Council;
- g. Milton Keynes City Council;
- h. West Northamptonshire Council; and
- i. Central Bedfordshire Council.

15.4.4 Existing and future land use receptors (such as residential properties, open space and recreational assets) will in general consider receptors within, and up to 500 m from, the EIA Scoping Boundary.

15.5 Baseline Conditions

15.5.1 This section provides a summary of the baseline conditions in respect of human health. The baseline is separated into two sections:

- a. Health profile; and
- b. Local receptors.

Health Profile

15.5.2 To understand the potential for health impacts, it is important to establish the health baseline within the study area. This section focuses on a number of health indicators (including population, age, ethnicity, economic activity, deprivation, life expectancy, general health, long-term illness and disability and unpaid care) at the local authority and national level to provide the demographic context of the local community. Wherever possible, the most recently available data are presented at all geographical levels relevant to the study area, using the Office for National Statistics (ONS) Census 2021 (Ref. 31), Index of Multiple Deprivation (Ref. 32), ONS Life expectancy estimates (Ref. 33) and The Office for Health Improvement & Disparities (OHID) Public Health Profiles (Ref. 34).

Population

15.5.3 **Table 15-3** below presents the population of all the local authority areas through which the Proposed Development is aligned using data from the Census 2021 (Ref. 31). The total population of these local authorities is approximately 3,364,000 people. Of the local authorities, Birmingham has

the largest population (1,144,900), much greater than the second largest in Buckinghamshire (553,100). The least populated local authority is North Warwickshire (65,000).

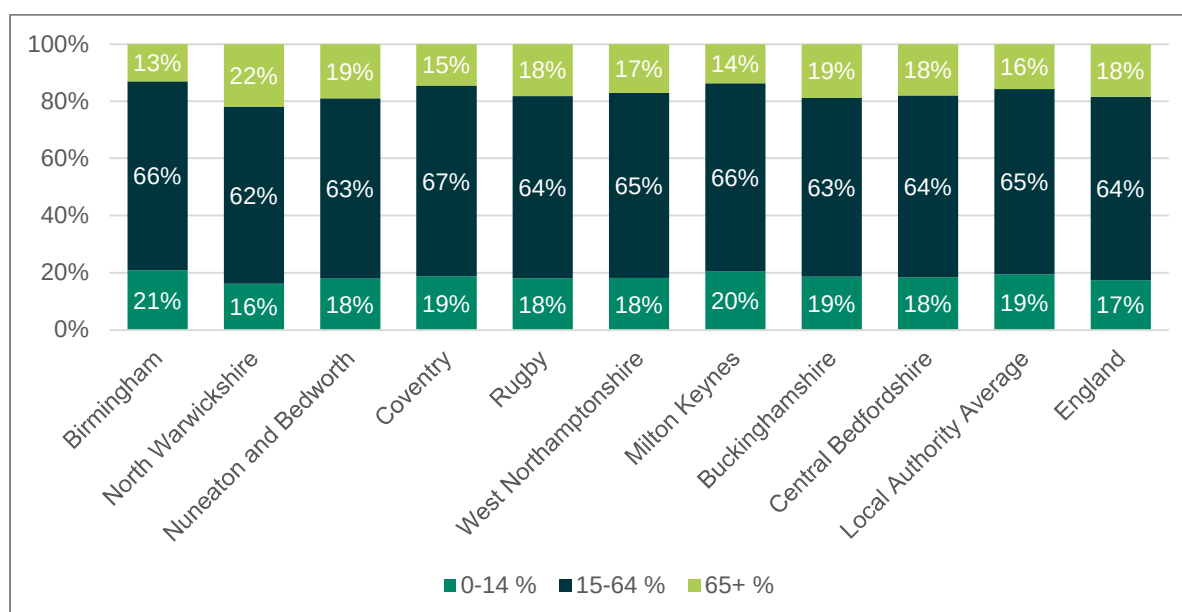
Table 15-3: Population

Local Authority	Population
England	56,490,000
Birmingham	1,144,900
Buckinghamshire	553,100
West Northamptonshire	425,700
Coventry	345,300
Central Bedfordshire	294,300
Milton Keynes	287,100
Nuneaton and Bedworth	134,200
Rugby	114,400
North Warwickshire	65,000
Local Authority Average	373,780

[Source: ONS (2022) Census 2021. (Ref. 31)]

15.5.4 **Plate 15-1** below shows the age profile of the local authorities within the study area. This can assist in indicating any future trends, any signs of an ageing population and sets out the requirements of future populations. Based on the 2021 Census (Ref. 31), the local authorities have more youthful populations compared to England as a whole, with 19.4% of residents aged between 0-14 compared to 17.4% nationally. The proportion of working age residents across the area (averaging 64.9%) aligns with national (64.2%).

Plate 15-1: Population Cohorts by Age Group



[Source: ONS (2022) Census 2021. (Ref. 31)]

Ethnicity

15.5.5 The 2021 Census (Ref. 31) contains data on the population ethnicity of the local authorities in the study area as well as nationally. As shown in **Table 15-4**, 81.0% of England's population is White; five of the local authorities have a higher proportion than England, four have a lower proportion. Of the local authorities within the study area, North Warwickshire has the highest proportion of residents identifying as White (96.1%). Birmingham has the lowest proportion of the population identifying as White (48.6%) and the highest proportion identifying as Asian across the local authorities (31.0%).

Table 15-4: Ethnicity

Local Authority	Asian (%)	Black (%)	Mixed (%)	White (%)	Other (%)
Birmingham	31.0	11.0	4.8	48.6	4.5
North Warwickshire	1.3	0.6	1.7	96.1	0.3
Nuneaton and Bedworth	8.0	1.8	1.8	87.1	1.2
Coventry	18.5	8.9	3.4	65.5	3.7
Rugby	7.6	2.7	2.8	85.7	1.1
West Northamptonshire	5.3	4.9	2.8	85.9	1.1
Milton Keynes	12.4	9.7	4.1	71.8	2.0
Buckinghamshire	12.4	2.6	3.5	79.9	1.6
Central Bedfordshire	3.5	2.4	3.0	90.2	0.8
Local Authority Average	11.1	5.0	3.1	79.0	1.8
England	9.6	4.2	3.0	81.0	2.2

[Source: ONS (2022) Census 2021 (Ref. 31)]

Economic Activity

15.5.6 The 2021 Census (Ref. 31) also provides data on economic activity, which can indicate trends in employment, unemployment, and economic inactivity within an area. In the study area, the proportion of economically active individuals (aged 16 and over) ranged from 52.1% in Birmingham to 64.9% in Milton Keynes, averaging 60.6% across the local authorities. This is a greater proportion than England as a whole, where 58.6% of the population were considered economically active. Generally, the study area performed well compared to national levels; seven of the nine local authorities had higher economic activity levels compared to England. Similarly, six of the local authorities also had a lower unemployment rate than England (2.9%). More economic activity statistics can be seen in **Table 15-5**.

Table 15-5: Economic Activity

Local Authority	Economically active (excluding full-time students) (%)	In employment (%)	Unemployed (%)	Economically Active Full-time Student (%)	Economically Inactive (%)
Birmingham	52.1	47.4	4.7	3.5	44.4
North Warwickshire	60.2	57.8	2.4	1.5	38.4
Nuneaton and Bedworth	59.6	56.9	2.8	1.7	38.7
Coventry	54.4	51.1	3.4	4.7	40.9
Rugby	63.6	61.4	2.1	1.9	34.5
West Northamptonshire	63.3	60.8	2.4	2.6	34.1
Milton Keynes	64.9	61.8	3.1	2.6	32.5
Buckinghamshire	62.7	60.3	2.4	1.7	35.6
Central Bedfordshire	64.6	62.5	2.2	1.8	33.6
Local Authority Average	60.6	57.8	2.8	2.4	37.0
England	58.6	55.7	2.9	2.3	39.1

[Source: ONS (2022) Census 2021. (Ref. 31)]

Deprivation

15.5.7 The Index of Multiple Deprivation (2019) (Ref. 32) Deprivation Score (IMD score) is an overall measure of multiple deprivation experienced by people living in an area. The 2019 Index of Deprivation is based on 37 indicators across seven domains of deprivation. These are combined using appropriate weighting to give an overall IMD score. Using a standardised scoring system like this allows areas to be compared based on their overall deprivation. IMD data is available at the local authority level and thus can indicate levels of the deprivation in the study area².

15.5.8 As shown in **Table 15-6** below, out of the seven local authorities with IMD data available, Birmingham has the lowest rank (6th) and is the most deprived with 41.3% of Lower Super Output Areas (LSOAs) in the most deprived 10% nationally. However, Central Bedfordshire is ranked the highest (264th) of the seven local authorities with IMD data available and has no LSOAs in the 10% most deprived nationally, indicating low levels of deprivation.

15.5.9 In terms of the Health Deprivation and Disability Domain (see **Table 15-6** below), Central Bedfordshire, Rugby and North Warwickshire all have zero LSOAs in the most deprived 10% nationally, whereas 21.6% of Birmingham's

² Data are not available for the Buckinghamshire local authority and only partially available for West Northamptonshire.

LSOAs are within this bracket. Evidently, the level of deprivation in the study area varies between the local authorities.

Table 15-6: Index of Multiple Deprivation

Local Authority	IMD Rank (based on average LSOA Rank)	Proportion of LSOAs in Most Deprived 10% Nationally (%)	Proportion of LSOAs in Most Deprived 10% Nationally for Health Deprivation and Disability Domain
Birmingham	6	41.3	21.6
North Warwickshire	155	2.6	0.0
Nuneaton and Bedworth	101	6.2	0.8
Coventry	81	14.4	6.2
Rugby	222	0.0	0.0
West Northamptonshire	N/A	5.7	N/A
Milton Keynes	172	5.3	2.6
Buckinghamshire	N/A	N/A	N/A
Central Bedfordshire	264	0.0	0.0

[Source: Ministry of Housing, Communities and Local Government (MHCLG) (2020) English Indices of Deprivation 2019 (Ref. 32)]

Life Expectancy

15.5.10 Data from the Office for National Statistics provides life expectancy profiles at local authority level (Ref. 33). **Table 15-7** presents the life expectancy from birth for males and females across the study area. There is a relatively high spread of life expectancy for both genders across the local authorities, ranging from 77.1 to 81.5 for males and 81.7 to 85.1 for females. The highest life expectancy for both males and females is in Buckinghamshire, whereas the lowest life expectancy for men is in Birmingham and for women in Nuneaton and Bedworth. Compared to England's male life expectancy of 79.4 and female life expectancy of 83.1, the study area performs relatively poorly; the average across the local authorities for men is at 79.1 and for women is at 82.9. For both genders, life expectancy is lower in five of the local authorities when compared to England.

Table 15-7: Life Expectancy

Local Authority	Male Life Expectancy at Birth	Female Life Expectancy at Birth
Birmingham	77.1	81.8
North Warwickshire	78.7	82.0
Nuneaton and Bedworth	77.3	81.7
Coventry	78.0	82.0

Local Authority	Male Life Expectancy at Birth	Female Life Expectancy at Birth
Rugby	79.7	83.6
West Northamptonshire	79.8	82.8
Milton Keynes	79.3	83.2
Buckinghamshire	81.5	85.1
Central Bedfordshire	80.7	84.0
Local Authority Average	79.1	82.9
England	79.4	83.1

[Source: ONS (2021) Life expectancy estimates, all ages, UK. (Ref. 33)]

General Health

15.5.11 Data from the Census 2021 (Ref. 31) provides information on the general health of the local authorities in the study area in **Table 15-8**. Six of the local authorities had the same or a greater proportion of individuals in very good health compared to the national average (48.5%). However, the average across the local authorities was similar to England at 48.7%. This ranged from 53.1% in Buckinghamshire to 44.3% in Nuneaton and Bedworth. The proportion of those in very bad health also varied across the local authorities, from 1.5% in Birmingham to 0.7% in Buckinghamshire, averaging 1.1% across the study area. There is variation in the level of general health across the study area, with a high proportion of those in very good health in local authorities such as Buckinghamshire and Milton Keynes, and those with very bad health in local authorities such as Birmingham and Nuneaton and Bedworth.

Table 15-8: Self-reported General Health

Local Authority	Very good health (%)	Good health (%)	Fair health (%)	Bad health (%)	Very bad health (%)
Birmingham	47.6	33.3	13.2	4.5	1.5
North Warwickshire	45.5	34.7	14.1	4.4	1.3
Nuneaton and Bedworth	44.3	35.4	14.4	4.5	1.3
Coventry	48.5	33.6	12.5	4.1	1.3
Rugby	48.8	34.8	12.0	3.4	0.9
West Northamptonshire	49.2	35.1	11.6	3.3	0.9
Milton Keynes	51.1	33.7	11.1	3.2	0.9
Buckinghamshire	53.1	33.2	10.3	2.6	0.7
Central Bedfordshire	50.4	34.5	11.3	3.0	0.8

Local Authority	Very good health (%)	Good health (%)	Fair health (%)	Bad health (%)	Very bad health (%)
Local Authority Average	48.7	34.3	12.3	3.7	1.1
England	48.5	33.7	12.7	4.0	1.2

[Source: ONS (2022) Census 2021 (Ref. 31)]

Long-term Illness and Disability

15.5.12 The 2021 Census (Ref. 31) provides data on the proportion of individuals living with long-term illnesses or disabilities. The proportion of individuals across the study area who are limited a lot in their day-to-day activities ranges from 5.0% in Buckinghamshire to 8.3% in Nuneaton and Bedworth, averaging 6.7% across the local authorities. The average proportion of individuals with no long-term health conditions across the local authorities (77.1%) was higher than in England (75.9%). Overall, the study area performs well in this health indicator compared to the national average. More data on long-term illness and disability can be seen in **Table 15-9** below.

Table 15-9: Long-terms Illness and Disability

Local Authority	Day-to-day activities limited a lot (%)	Day-to-day activities limited a little (%)	Has long term physical or mental health condition but day-to-day activities are not limited	No long term physical or mental health conditions (%)
Birmingham	8.1	9.2	5.1	77.6
North Warwickshire	8.0	10.5	7.0	74.5
Nuneaton and Bedworth	8.3	10.8	6.7	74.2
Coventry	7.4	9.2	5.7	77.7
Rugby	6.0	9.8	7.3	76.9
West Northamptonshire	5.9	9.3	7.1	77.6
Milton Keynes	5.9	8.9	6.4	78.8
Buckinghamshire	5.0	8.5	7.2	79.3
Central Bedfordshire	5.5	9.5	7.7	77.3
Local Authority Average	6.7	9.5	6.7	77.1
England	7.3	10.0	6.8	75.9

[Source: ONS (2022) Census 2021 (Ref. 31)]

Unpaid Care

15.5.13 The 2021 Census (Ref. 31) provides data on the provision of unpaid care individuals supply each week across the local authorities in the study area as well as nationally. As presented in **Table 15-10**, the proportion of individuals providing no unpaid care in a week ranges from 90.1% to 92.3% across the local authorities, with eight having a greater proportion compared to England (91.2%). Nationally, 8.7% of individuals provide some amount of unpaid care a week; only North Warwickshire and Nuneaton and Bedworth have a greater proportion, with 9.9% and 9.7% of individuals providing some amount of unpaid care a week respectively. The average across the study area was 8.6%, only marginally lower than the 8.7% recorded in England.

Table 15-10: Unpaid care

Local Authority	Provides no unpaid care (%)	Provides 9 hours or less unpaid care a week (%)	Provides 10 to 19 hours unpaid care a week (%)	Provides 20 to 34 hours unpaid care a week (%)	Provides 35 to 49 hours unpaid care a week (%)	Provides 50 or more hours unpaid care a week (%)	Provides some amount of unpaid care a week (%)
Birmingham	91.5	2.4	1.1	0.7	0.7	2.0	8.0
North Warwickshire	90.1	3.5	1.3	0.9	1.0	3.2	9.9
Nuneaton and Bedworth	90.2	3.1	1.3	0.9	1.2	3.2	9.7
Coventry	91.6	2.8	1.2	0.9	1.0	2.6	8.5
Rugby	91.7	3.3	1.2	0.7	0.8	2.3	8.3
West Northamptonshire	92.1	3.1	1.1	0.7	0.8	2.3	8.0
Milton Keynes	92.3	2.8	1.0	0.8	0.9	2.2	7.7
Buckinghamshire	92.0	3.5	1.1	0.7	0.7	2.0	8.0
Central Bedfordshire	91.5	3.5	1.2	0.7	0.8	2.3	7.6
Local Authority Average	91.4	3.1	1.2	0.8	0.9	2.5	8.4
England	91.2	3.1	1.2	0.8	1.0	2.6	8.7

[Source: ONS (2022) Census 2021 (Ref. 31)]

Other Health Indicators

15.5.14 **Table 15-11** provides a profile of health and wellbeing in the local authorities within the study area, focusing on key indicators identified by Public Health England (Ref. 34).

Table 15-11: Other health indicators

Local Authority	Birmingham	North Warwickshire	Nuneaton and Bedworth	Coventry	Rugby	West Northamptonshire	Milton Keynes	Buckinghamshire	Central Bedfordshire
Under 75 mortality rate from all causes (2022)*	434.4	364.9	395.9	428.9	314.8	N/A	345.8	262.5	305.7
Under 75 mortality rate from circulatory diseases (2022)*	101	89.8	83.8	94.6	73.9	N/A	71.6	50.4	62.1
Under 75 mortality from cancer (2022)*	139.6	133.7	130.4	154.2	118.6	N/A	130.1	106.3	129.1
Suicide rate (2020 – 2022)*	8.5	12	11.8	8.7	10.1	N/A	11.3	10.8	8.3
Admission episodes for alcohol-related conditions (2021/2022)*	499	388	478	649	567	N/A	392	375	469
Physically Active Adults (2021/2022) (%)	58.1	68.8	56.7	58.4	67.2	N/A	67.5	73.2	68.5
Adults (aged 18+) classified as overweight or obese (2021/2022) (%)	66.2	69.3	72.9	65.3	63.8	N/A	66	60	68.5
Adult Smokers 2022 (%)	13.6	17.1	17.1	18.4	18.2	N/A	13.8	10.6	15

[Source: The Office for Health Improvement & Disparities (OHID) (2020) Public Health Profiles. (Ref. 34)]

**Presented as a directly standardised rate per 100,000 for all persons.*

Local receptors

15.5.15 This section presents an overview of the health infrastructure receptors (hospitals and accident and emergency facilities) located within or up to 500 m from the EIA Scoping Boundary for each part of the Proposed Development. Where no receptors are identified within the 500 m study area, the closest health infrastructure receptor has been identified with an approximate distance from the EIA Scoping Boundary. Residential properties, community facilities and recreational receptors relevant to the health and wellbeing assessment are identified in **Chapter 19: Socio-economics**.

Part 1a: Minworth AWTP

15.5.16 The proposed Part 1a EIA Scoping Boundary includes part of the existing Minworth Wastewater Recycling Centre (WwRC) and redundant operation land to the south-east known as Curdworth Beds. There are no hospitals or accident and emergency (A&E) facilities within 500 m of the proposed Minworth AWTP EIA Scoping Boundary. The closest health infrastructure receptors to Part 1a are located in Birmingham.

Part 1b: Minworth to Atherstone Pipeline

15.5.17 Part 1b of the Proposed Development comprises a 16 km pipeline from the Minworth AWTP to an outfall on the Coventry Canal at Atherstone. The pipeline alignment passes to the north of the village of Lea Marston close to the Minworth AWTP, before heading north-east in close proximity to the villages of Hurley and Baxterley and town of Atherstone. There are no hospitals or A&E facilities within 500 m of the proposed Part 1b EIA Scoping Boundary. The closest health infrastructure receptors to Part 1b are located in Birmingham.

Part 2: Works to the Coventry, Oxford and Grand Union Canals

15.5.18 Part 2 of the Proposed Development comprises works to the Coventry, Oxford and Grand Union Canals. There is a hospital located in Nuneaton which falls within 500 m of the Part 2 EIA Scoping Boundary around the Coventry Canal. There are no hospitals or A&E facilities within 500 m of the Oxford Canal or Grand Union Canal. The closest healthcare infrastructure receptors to these two canals are located in Rugby and Milton Keynes respectively.

Part 3: Daventry and Drayton Reservoirs

15.5.19 Daventry and Drayton are supply reservoirs (i.e. they provide a supply of water to the canal for navigation) and in addition to this are also proposed to provide storage options to support the Grand Union Canal transfer. Works for Part 3 of the Proposed Development are not within 500 m of any hospitals or A&E facilities, with the closest relevant health receptors located in the town of Daventry.

Part 4a: Abstraction, Storage and Treatment

15.5.20 The Part 4a EIA Scoping Boundary includes two options for the abstraction, storage and treatment site, both of which are located within the administrative boundary of Buckinghamshire Council.

15.5.21 As set out in **Chapter 1: Introduction** and **Chapter 3: Description of the Proposed Development**, Site B lies south of Milton Keynes near Bletchley and Site H lies south of Leighton Buzzard near the village of Slapton. There are no hospitals within 500 m of Site B or Site H, with the closest hospital and A&E facilities located in the urban centres of Milton Keynes and Luton respectively.

Part 4b: Pipeline to an Underground Reservoir near Luton

15.5.22 A number of pipeline route options remain within the Part 4b EIA Scoping Boundary from Sites B and H to the existing underground reservoir near Luton as detailed in **Chapter 3: Description of the Proposed Development**. Site B would require the implementation of pipeline route option SP2 for which two alternative alignments SP2A and SP2B have also been identified. Site H would require the implementation of either SP5 or a combination of SP6 and SP7. Pipeline route option SP10, and/or its variations SP10A, SP10B and SP10C, would be implemented regardless of which abstraction, storage and treatment site is selected. The following receptors are within proximity to the route options:

- a. Works near SP2, SP2A and SP2B are not within 500 m of any hospitals or A&E facilities. The closest health infrastructure receptors are located in Bedford;
- b. Works near SP5, SP6 and SP7 are not within 500 m of any hospitals or A&E facilities. The closest health infrastructure receptors are located in Luton; and
- c. Works near SP10, SP10A, SP10B and SP10C are not within 500 m of any hospitals or A&E facilities. The closest health infrastructure receptors are located in Luton.

Future Baseline

15.5.23 ONS Population projections (Ref. 35) provide data on population projections at local authority level³. Anticipated population change in the study area is shown in **Table 15-12**. The average projected population growth across the local authorities between 2021 and 2040 is 8.5%, higher than the average across England (7.3%). Of the local authorities, Coventry has the highest projected population growth (17.0%), followed by North Warwickshire (15.7%). Populations are expected to increase in all local authorities.

Table 15-12: Population Projections

Geography	2021	2040	Percentage Change (%)
Birmingham	1,157,300	1,238,600	7.0%
North Warwickshire	67,200	77,700	15.7%
Nuneaton and Bedworth	131,200	145,800	11.2%

³ Data is unavailable for the local authority of West Northamptonshire as the dataset uses local authorities as of 2019; West Northamptonshire was created in 2021. Therefore, it has been excluded.

Geography	2021	2040	Percentage Change (%)
Coventry	383,800	449,000	17.0%
Rugby	110,700	124,300	12.8%
Milton Keynes	272,500	282,100	3.5%
Buckinghamshire	548,900	575,000	4.8%
Central Bedfordshire	293,000	324,100	10.6%
Local Authority Total	2,964,600	3,216,600	8.5%
England	56,989,600	61,157,900	7.3%

[Source: ONS (2018) Population Projections (Ref. 35)]

15.6 Potential Effects

Construction Phase

- 15.6.1 The scoping of potential effects from the Proposed Development during the construction phase is presented within **Table 15-13** below. The list of potential effects during construction has been derived from the IEMA Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (Ref. 1).

Table 15-13: Potential effects during the construction phase – Human health

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Healthcare and other social infrastructure. Changes in access to and demand for healthcare services and other community facilities.	In	All	The Proposed Development could lead to changes in access to healthcare services and other community facilities for residents of nearby residential receptors (including permanent residential moorings). This impact could arise from construction traffic or route diversions potentially impacting on accessibility, and through the additional burden of construction worker demand.
Open space, play and leisure. Changes in availability and quality of, and access to, public areas of open space and recreational walking and cycling routes.	In	All	The Proposed Development could lead to changes in access to and quality of public areas of open space and recreational walking and cycling routes for residents during construction. The Proposed Development could also change levels of physical activity, including access to and use of canal towpaths.
Transport modes, access and connections. Changes in community severance, vehicles on the local road network and public transport.	In	All	The Proposed Development could lead to changes in traffic flows on the local road network and public transport during construction.
Economic environment (employment and income, education and training opportunities). Direct and indirect job creation and economic	In	All	The Proposed Development could create employment and supply chain opportunities, as well as offer temporary training and upskilling opportunities such as apprenticeships during the construction phase.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
activity, as well as educational opportunities and support.			
Air quality. Changes in air pollutants from construction activities.	In	Part 2 and 3	The Proposed Development could lead to significant levels of, or harmful air pollutants from construction activities. Construction works at Part 2 and 3 are considered to have low dust generating potential, however given the sensitivity of the canal network and users, a construction dust risk assessment has been scoped in to Chapter 9: Air Quality and Odour . Therefore, there is potential for adverse health effects arising from compromised air quality during construction.
	Out	Parts 1a, 1b, 4a and 4b	As set out in Chapter 9: Air Quality and Odour no significant air quality or amenity impacts from dust generation are likely at Parts 1a and 4a if management measures are adopted. At Part 1b and 4b, potential air quality impacts are scoped in to the Air Quality assessment for ecological receptors only. Air quality effects on human health would likely be managed by a Dust Management Plan and Odour Management Plan under the Code of Construction Practice.
Air quality. Changes in air pollutants from construction road traffic.	Out	All	As stated in Chapter 9: Air Quality and Odour , construction traffic emissions is scoped out of the EIA based on professional judgement concluding that it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria. Therefore, this is scoped out of the human health assessment.
Noise and vibration. Changes in construction noise and vibration and road traffic noise.	In	All	The Proposed Development could lead to potential significant noise effects in regard to construction noise and vibration and road traffic noise. This could lead to adverse impacts on residential amenity (including permanent residential moorings) and mental health and wellbeing.
Landscape and visual amenity. Changes in	In	All	The Proposed Development could lead to changes in visual amenity of public areas of open space, active travel walking and cycling routes during construction.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
visual amenity of public areas of open space, active travel walking and cycling routes.			In addition the Proposed Development may prevent access to and connection with nature along the canal during construction which may impact the health and wellbeing of waterway users.
Water quality. Changes in contaminated runoff, spills, or leaks of hazardous substances and/or historical land uses.	In	All	The Proposed Development could lead to accidental leaks of hazardous substances during construction. This could adversely impact the health of residents within the local communities and users of public water supplies if water becomes contaminated.
Water availability. Changes in water availability during construction.	Out	All	The Proposed Development is unlikely to lead to changes water availability during construction. Chapter 22: Water Environment and Flood Risk will be kept under review and if there are significant effects to the water environment that relate to human receptors, drinking or bathing water, this will be scoped in to the assessment of human health.
Climate change mitigation and adaptation. Changes to Greenhouse Gas (GHG) emissions, extreme weather events, flood risk, temperature change and rainfall change.	In	All	Climate change poses a threat to the health, safety and security of the global population, both through direct hazards and indirectly due to damage to the living environment. Greenhouse gas (GHG) emissions from the construction phase could potentially have an indirect impact on human health, as emissions will contribute towards changing climatic conditions which may lead to extreme weather, heat and flood risk and exacerbation of cardiovascular and respiratory conditions.
Health-related behaviours: physical activity; risk taking behaviour; diet and	Out	All	Given the nature of the Proposed Development, construction activity is not anticipated to impact risk taking behaviour or diet and nutrition. Physical activity is scoped out as changes in physical activity will be covered under the open space, play and leisure health determinant.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
nutrition. Changes to levels of physical activity, risk taking behaviour and consideration for diet and nutrition.			
Housing. Changes to housing need and provision. Changes in access to residential properties	In	All	The Proposed Development could lead to temporary or permanent land take from residential properties including moorings which may be displaced due to the works. This could lead to adverse impacts on mental health and wellbeing.
Social participation, interaction and support. Changes to opportunities for community participation and interaction, and for social and family support.	In	Parts 1b, 2, 3 and 4b.	Parts 1b, 2 and 3 and 4b of the Proposed Development could affect indoor or outdoor community assets and meeting places, for voluntary, social, cultural or spiritual participation through potential displacement and land take impacts.
	Out	Parts 1a and 4a.	Given the absence of existing community assets at Parts 1a and 4a of the Proposed Development, construction activity is not anticipated to impact social participation, interaction and support.
Social environment: relocation; community safety; community identity; and culture, resilience and influence. Changes to perception and actual level of risk and crime. Changes to community identity such as sense of belonging.	Out	All	Given the nature of the Proposed Development, construction activity is not anticipated to impact the social environment.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Bio-physical environment: radiation. Changes to exposure to radiation risks.	Out	All	Given the nature of the Proposed Development, construction activity is not anticipated to impact radiation.
Institutional and built environment: wider societal infrastructure and resources. Changes to features of the built environment and wider public health environment that contribute to physical and mental health outcomes.	Out	All	Given the nature of the Proposed Development, construction activity is not anticipated to impact the built environment or wider societal infrastructure and resources.

Operational Phase

- 15.6.2 The scoping of potential effects from the Proposed Development during the operational phase is presented within **Table 15-14** below. The list of potential effects during operation has been derived from the IEMA Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (Ref. 1).

Table 15-14: Potential effects during the operational phase – Human Health

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Healthcare and other social infrastructure. Permanent changes in access to and demand for healthcare services and other community facilities.	Out	All	Activities associated with the operation of the Proposed Development will be minimal, such as maintenance, and unlikely to cause significant effects on community and social infrastructure, and therefore health effects as a result. While there are a number of community facilities in proximity to the Proposed Development, given the nature of the works and limited anticipated operational traffic, the operational phase of the Proposed Development is not expected to impact healthcare and other social infrastructure as a determinant of human health.
Open space, play and leisure. Permanent changes in availability and quality of, and access to, public areas of open space and recreational walking and cycling routes.	Out	All	Given the minimal nature of maintenance works, the Proposed Development is unlikely to lead to significant effects on open space, play and leisure as a determinant of human health beyond construction once complete and operational.
Transport modes, access and connections. Permanent changes in community severance, vehicles on the local road network and public transport.	Out	All	Given the minimal nature of maintenance works, there is limited anticipated level of traffic once the Proposed Development is complete and operational. As such the Proposed Development is unlikely to impact transport modes, access and connections as a determinant of human health and is proposed to be scoped out of the EIA.
Economic environment (employment and income, education and	Out	All	Given the minimal nature of maintenance works, it is anticipated the generation of operational employment and wider economic benefits will be limited.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
training opportunities). Operational direct and indirect job creation and economic activity, as well as educational opportunities and support.			
Air quality. Permanent changes in air pollutants from operational activities.	Out	All	Given the minimal nature of maintenance works during operation, the Proposed Development is unlikely to impact air quality as a determinant of human health.
Air quality. Changes in air pollutants from operational road traffic.	Out	All	As stated in Chapter 9: Air Quality and Odour , operational traffic emissions is scoped out of the EIA based on professional judgement concluding that it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria. Therefore, this is scoped out of the human health assessment.
Noise and vibration. Permanent changes to noise and vibration and road traffic noise.	In	Parts 1a, 1b (Break Pressure Tank only), 2 and 4a	Chapter 18: Noise and Vibration identifies potential for noise effects at Part 1a, 1b (Break Pressure Tank only) 2 and 4a of the Proposed Development once complete and operational. As a result the Proposed Development could impact noise as a determinant of human health.
	Out	Parts 1b (excluding Break Pressure Tank), 3 and 4b	Parts 1b (excluding Break Pressure Tank), 4b and 3 do not include any noise emitting operational plant. As such Chapter 18: Noise and Vibration scope out operational noise assessment for these parts as potential for noise effects are unlikely. Therefore, the Proposed Development is unlikely to impact noise and vibration as a determinant of human health at Parts 1b, 4b and 3.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Noise and vibration. Permanent changes to road traffic noise.	Out	All	As stated in Chapter 18: Noise and Vibration , the Proposed Development is not expected to generate significant additional traffic flows once operational. Therefore, no significant noise levels are anticipated during operation.
Landscape and visual amenity. Permanent changes in visual amenity of public areas of open space, active travel walking and cycling routes.	In	All	Chapter 16: Landscape and Visual identifies potential for landscape and visual effects from the introduction of permanent infrastructure once the Proposed Development is complete and operational. As a result the Proposed Development could impact landscape and visual amenity as a determinant of human health.
Water quality. Permanent changes in water quality.	In	All	Chapter 22: Water Environment and Flood Risk identifies that operational maintenance works have the potential to lead to the accidental release of hazardous substances into the ground and reach the water table, deteriorating the quality of groundwater. Therefore, impacts for the operational phase of the Proposed Development on drinking water quality have been scoped in to the assessment of human health.
Water availability. Permanent changes in water availability.	In	All	It is expected that the Proposed Development will increase the availability of water supply for Affinity Water customers. Impacts on drinking water quantity or access can lead to changes in human health. Impacts on water supply have therefore been scoped in.
Climate change mitigation and adaptation. Permanent changes to Greenhouse Gas (GHG) emissions, extreme weather events, flood	In	All	Chapter 10: Climate identifies that GHG emissions from the operational phase could potentially have an indirect impact on human health, as emissions will contribute towards changing climatic conditions which may lead to extreme weather, heat and flood risk and exacerbation of cardiovascular and respiratory conditions. As a result the Proposed Development could lead to impacts on climate as a determinant of human health.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
risk, temperature change and rainfall change.			
Health-related behaviours: physical activity; risk taking behaviour; diet and nutrition. Permanent changes to levels of physical activity, risk taking behaviour and consideration for diet and nutrition.	Out	All	Given the nature of the Proposed Development, operation is not anticipated to impact physical activity, risk taking behaviour or diet and nutrition.
Housing. Permanent changes to housing need and provision.	Out	All	Given the nature of the Proposed Development, the operational phase is not anticipated to lead to changes in housing provision beyond those impacts identified as permanent in the construction phase.
Social participation, interaction and support. Permanent changes to opportunities for community participation and interaction, and for social and family support.	Out	All	Given the nature of the Proposed Development, the operational phase is not anticipated to impact social participation, interaction, and support beyond those impacts identified as permanent in the construction phase.
Social environment: relocation; community safety; community identity; and culture, resilience and influence.	Out	All	Given the nature of the Proposed Development, operation is not anticipated to impact the social environment.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Permanent changes to perception and actual level of risk and crime. Permanent changes to community identity and social participation such as sense of belonging.			
Bio-physical environment: radiation. Permanent changes to exposure to radiation risks.	Out	All	Given the nature of the Proposed Development, operation is not anticipated to impact radiation.
Institutional and built environment: built environment; wider societal infrastructure and resources. Permanent changes to features of the built environment and wider public health environment that contribute to physical and mental health outcomes.	Out	All	Given the nature of the Proposed Development, operation is not anticipated to impact the built environment or wider societal infrastructure and resources.

15.7 Approach to Assessment

Establishing Baseline Conditions

- 15.7.1 Baseline data illustrating the existing health baseline within and surrounding the EIA Scoping Boundary has been collected through desk-based research using publicly available sources, documents, and web-based applications, and is presented within Section 15.5 of this chapter. Any additional baseline data collection at the assessment stage will also be gathered through desk-based research. Data sources may include ONS and the Ministry of Housing, Communities and Local Government (MHCLG).

Assessment Methodology

- 15.7.2 The IEMA guidance ‘Determining Significance For Human Health In Environmental Impact Assessment’ will form the basis of the approach adopted to assess impacts on human health in this chapter. The World Health Organisation (WHO) defines health as a “*state of complete physical, mental and social wellbeing not merely the absence of disease or infirmity*” (Ref. 36). Public health therefore encompasses general wellbeing not just the absence of illness and includes consideration of both physical and mental health/wellbeing.
- 15.7.3 The health and wellbeing of individuals is determined by a broad range of individual constitutional and behavioural factors (or “determinants”), as well as broader environmental, social and economic factors. Some factors are direct and obvious, others are indirect. Within a population there can also be health inequalities, defined by the WHO as “...*differences in health status or in the distribution of health determinants between different population groups. For example, differences in mobility between elderly people and younger populations or differences in mortality rates between people from different social classes*” (Ref. 36).
- 15.7.4 IEMA’s ‘Guide to Effective Scoping of Human Health in Environmental Impact Assessment’ (Ref. 1) lists 22 potential determinants of health, under five broad categories: health-related behaviours, social environment, economic environment, bio-physical environment, and institutional and built environment. The guidance describes how a consideration of source-pathway-receptor linkages assists in identifying where there is potential for health effects to be both likely and significant. **Table 15-15** sets out a summary of the health determinants scoped into this assessment, and the source, pathway and receptor links relevant to each.

Table 15-15: Health determinants scoped into human health assessment – Source-Pathway-Receptor links

Determinant	Source	Pathway	Receptor
Healthcare and social infrastructure	Changes in access to and demand for healthcare services and other community facilities.	Increased demand for services from workers at the Proposed Development. Severance due to	Residents of nearby residential receptors, including permanent residential

Determinant	Source	Pathway	Receptor
		land take or vehicle movements leading to reduced access to facilities.	moorings and users of local community facilities.
Open space, play and leisure	Changes in availability and quality of public areas of open space and recreational walking and cycling routes.	Changes in levels of use of open space and recreational assets, affecting physical activity and wellbeing outcomes.	Residents and visitors using local open spaces, route network and recreational assets.
Transport modes, access and connections	Changes in the number of vehicles on the local road network and public transport.	Changes in severance, pedestrian amenity, public transport amenity, and road safety.	Users of the local road network and public transport, including motor vehicle drivers as well as pedestrians and cyclists.
Economic environment (employment and income, education and training opportunities)	Direct and indirect job creation and economic activity, as well as educational opportunities and support.	Employment opportunities providing health-supporting resources and protecting against adverse mental health effects.	People of working age and their dependents.
Air quality	Changes in air pollutants, vapours and ground gases from construction activities and road traffic.	Changes in diffusion through the air.	Residents of nearby residential receptors and users of local community facilities.
Noise and vibration	Construction noise and vibration and road traffic noise.	Changes in pressure waves through the air, and ground for vibration.	Residents within the local communities and users of local community facilities.
Landscape and visual amenity	Changes in visual amenity of public areas of open space, active travel walking and cycling routes.	Changes in the quality green space, affecting physical activity and wellbeing outcomes.	Residents within the local communities.
Water quality and availability	Changes in contaminated	Changes to the quality of local	Residents within the local

Determinant	Source	Pathway	Receptor
	runoff, spills, or leaks of hazardous substances and/or historical land uses.	drinking water supply. Transmission through surface and/or groundwater, including flooding.	communities and users of public water supplies.
Climate change mitigation and adaptation	Changes to Greenhouse Gas (GHG) emissions, extreme weather events, flood risk, sea level rise, temperature change and rainfall change.	Changes in exposure to GHG emissions, extreme weather events, flood risk, sea level rise, temperature change or rainfall change affecting human health and wellbeing.	Residents within the local communities as well as the wider population.
Housing	Direct land take effects could impact residential property (including residential moorings).	Temporary or permanent land take leading to reduced housing provision.	Residents within the local communities.
Social participation, interaction and support	Changes in community participation and interaction associated the Proposed Development	Changes to levels of community participation, interaction, and support that have implications for mental and physical health.	Residents within the local communities as well as the wider population.

15.7.5 As set out within **Table 15-13** and **Table 15-14**, the following health determinants have been scoped out of the assessment as they are unlikely to be relevant to the Proposed Development and no source-pathway-receptor link has been identified:

- a. Health-related behaviours: physical activity; risk taking behaviour; diet and nutrition;
- b. Social environment: community safety; community identity; culture, resilience and influence; social participation, interaction and support;
- c. Bio-physical environment: radiation; and
- d. Institutional and built environment: built environment; wider societal infrastructure and resources.

15.7.6 In accordance with the determinants which are considered relevant to this assessment, the health assessment will draw upon the information reported within the following technical chapters:

- a. **Chapter 9: Air Quality and Odour;**
- b. **Chapter 10: Climate;**

- c. **Chapter 14: Ground Conditions;**
- d. **Chapter 16: Landscape and Visual;**
- e. **Chapter 18: Noise and Vibration;**
- f. **Chapter 19: Socio-economics;**
- g. **Chapter 20: Traffic and Transport; and**
- h. **Chapter 22: Water Environment and Flood Risk.**

Assessment Criteria

15.7.7 The specific magnitude and sensitivity criteria that will be applied for the human health assessment reflects the IEMA guidance, 'Determining Significance For Human Health In Environmental Impact Assessment' (Ref. 30). For human health, there is no accepted definition of what constitutes a significant (or not significant) effect. It is, however, recognised that effects are categorised based upon the relationship between the magnitude of effect and the sensitivity of the affected human receptor. As such the significance criteria of human health effects during construction and operation of the Proposed Development will be assessed based on expert judgement and professional experience of the author, relying on the following considerations:

- a. Sensitivity of human health receptors including general population and potentially vulnerable sub-populations: specific values in terms of sensitivity can be attributed to population health considering levels of deprivation, inequality, community concern, care provision and adaptability. The assessment takes account of the qualitative (rather than quantitative) sensitivity of relevant populations; and
- b. Magnitude of impact: this entails consideration of the scale of the exposure of the population to an impact; whether the impact is one-off or continuous; the likely nature of the human health impact; the permanence of the change; and the proportion of the relevant study area population that would be affected.

Sensitivity of Receptors

15.7.8 The sensitivity of population health is driven by a number of factors which are set out in **Table 15-16**, and are based on guidance set out in the IEMA guidance (Ref. 30).

Table 15-16: Human Health Sensitivity Criteria

Sensitivity level	Sensitivity criteria
High	High levels of deprivation (including pockets of deprivation); reliance on shared resources (between the population and the Proposed Development); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.

Sensitivity level	Sensitivity criteria
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very Low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependent); people with good health status; and/or people with a very high capacity to adapt.

[Source: Adapted from: IEMA Guide to Determining Significance for Health (see Table 7.1) – Ref. 30]

Magnitude of Impacts

15.7.9 Magnitude of impact is driven by a number of factors which are set out in **Table 15-17**, based on guidance set out in the IEMA guidance (Ref. 30).

Table 15-17: Human Health Magnitude of Impact Criteria

Magnitude level	Magnitude criteria
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) or very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or moderate change in quality of life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality of life; small minority of population affected; rapid reversal; slight service quality implications.
Very Low	Negligible exposure or small scale; very short-term duration; one off frequency; severity predominantly relates to minor change in quality of life; very few people affected; immediate reversal once activity completes; no service quality implications.

[Source: Adapted from: IEMA Guide to Determining Significance for Health (Table 7.2) – Ref. 30.]

Effect Significance

15.7.10 Human health effects reflect the relationship between the sensitivity of the relevant population health, and the magnitude of the impact, as set out in **Table 15-18**.

Table 15-18: Impact Assessment and Significance

Magnitude of impact	Sensitivity of Receptor			
	High	Medium	Low	Very Low
High	Major	Major/moderate	Moderate/minor	Minor/negligible
Medium	Major/moderate	Moderate	Minor	Minor/negligible
Low	Moderate/minor	Minor	Minor	Negligible
Very Low	Minor/negligible	Minor/negligible	Negligible	Negligible

15.7.11 The assessment aims to be objective and quantifies effects as far as possible. However, some effects can only be evaluated on a qualitative basis. Effects will be defined as follows:

- a. Beneficial classifications of effect indicate an advantageous effect on human health, which may be minor, moderate or major in scale;
- b. Adverse classifications of effect indicate a disadvantageous effect on human health, which may be minor, moderate or major in scale;
- c. Negligible classifications of effect indicate imperceptible effects on human health; and
- d. No effect classifications indicate that there are no effects on human health.

15.7.12 In accordance with the methodology set out in the IEMA guidance (Ref. 30), the following criteria will be applied:

- a. 'Moderate' or 'major' effects are classed 'significant';
- b. 'Minor' effects are classed as 'not significant', although they may be a matter of local concern; and
- c. 'Negligible' effects are classed as 'not significant'.

15.8 Assumptions, Limitations and Uncertainties

15.8.1 The baseline conditions analysis will be carried out against a benchmark of current health baseline conditions prevailing around the Proposed Development, as far as is possible within the limitations of individual datasets. Baseline data will be subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.

15.9 Approach to Mitigation

15.9.1 Mitigation and measures for the construction and operational phases (some of which may have already been considered through the early development

of the proposals) will be considered during the assessment. Additional mitigation will be developed, where required, as the design is progressed and will be included in the Environmental Statement (ES), as appropriate. Where significant adverse effects are found, additional mitigation will be provided.

15.9.2 Mitigation set out for air quality and odour, climate, landscape and visual amenity, noise and vibration, socio-economics, traffic and transport and water environment and flood risk is likely to also be relevant for minimising human health effects on local receptors.

15.9.3 Mitigation for minimising construction disturbance and protocols for managing waste and pollution will be set out within a Code of Construction Practice and Outline Construction Traffic Management Plan to be submitted with the DCO application.

15.10 References

- Ref. 1 Institute of Environmental Management and Assessment (IEMA) (2022) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment.
- Ref. 2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 07/02/2025].
- Ref. 3 Health and Care Act 2022. Available at: <https://www.legislation.gov.uk/ukpga/2022/31/contents> [Accessed 07/02/2025].
- Ref. 4 Department for Environment, Food & Rural Affairs (Defra) (2023) National Policy Statement for water resources infrastructure. Available at: https://assets.publishing.service.gov.uk/media/6437e3a2f4d420000cd4a1a7/E02879931_National_Policy_Statement_for_Water_Resources.pdf [Accessed 07/02/2025].
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- Ref. 6 NHS, Long Term Plan (2019). Available at: <https://www.longtermplan.nhs.uk/> [Accessed 07/02/2025].
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Chapter 16: Landscape and Visual

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16. Landscape and Visual

16.1 Introduction

- 16.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on landscape character and visual amenity.
- 16.1.2 Landscape and visual effects are interrelated but are assessed separately in line with good practice. Landscape character effects relate to changes to both the physical elements of the landscape and the perceptual aspects and qualities which contribute to its distinctive character. Visual effects relate to changes to views experienced by people through the addition and/or removal of elements.
- 16.1.3 This chapter is supported by the following figures in Volume 2 of this EIA Scoping Report:
- a. **Figure 16-1: Parts 1, 2,3 & 4 Topography;**
 - b. **Figure 16-2: Parts 1, 2, 3 & 4 National Landscape Character;**
 - c. **Figure 16-3: Part 1a Regional Landscape Character;**
 - d. **Figure 16-4: Part 1a Zone of Theoretical Visibility (With Vegetation);**
 - e. **Figure 16-5: Part 1a Landscape Designation and Location of Visual Receptors;**
 - f. **Figure 16-6: Part 1b Regional Landscape Character;**
 - g. **Figure 16-7: Part 1b Landscape Designation and Location of Visual Receptors;**
 - h. **Figure 16-8: Parts 2, 3 & 4 Regional Landscape Character;**
 - i. **Figure 16-9: Parts 2, 3 & 4 Landscape Designation and Location of Visual Receptors;**
 - j. **Figure 16-10: Part 4a – Site B Zone of Theoretical Visibility (with vegetation); and**
 - k. **Figure 16-11: Part 4a – Site H Zone of Theoretical Visibility (with vegetation).**

16.2 Legislation, Planning Policy Context, and Guidance

- 16.2.1 Legislation, planning policy and guidance relating to landscape and visual amenity is outlined below.

Legislation

- 16.2.2 The applicable legislation is the European Landscape Convention 2000 (Ref. 1), which has informed the assessment methodology and identification of sensitive receptors described in this chapter.

- 16.2.3 Section 85 of the Countryside and Rights of Way Act 2000 ('CRoW Act') (Ref. 2) places a duty on relevant authorities to consider the purpose of conserving and enhancing the natural beauty of a National Landscape¹.

National Policies, Plans and Strategies

- 16.2.4 The relevant national policies, plans and strategies for landscape and visual amenity are summarised within **Table 16-1** below.
- 16.2.5 These documents have informed the assessment methodology, identification of sensitive receptors and the study areas described within this chapter.

¹ Formerly referred to as 'Area of Outstanding Natural Beauty' (AONB)

Table 16-1: National policies, Plans and Strategies – Landscape and Visual

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 3)	Landscape and visual impacts: • Paragraphs 4.9.1 to 4.9.6. set out requirements for the landscape and visual assessment; • Paragraphs 4.9.7 to 4.9.9 set out requirements for mitigation; and • Paragraphs 4.9.10 to 4.9.17 set out requirements for decision making. Land use including open space, green infrastructure, and Green Belt: • Paragraphs 4.10.10, 4.10.11 and 4.10.13 set out requirements for the landscape and visual assessment; • Paragraphs 4.10.17 to 4.10.21 set out requirements for mitigation; and • Paragraphs 4.10.22 to 4.10.28 set out requirements for decision making.	• Paragraphs 4.9.1 to 4.9.6: The policy sets out the requirements for scope and method of assessment for landscape and visual impacts; • Paragraphs 4.9.7 to 4.9.9: The policy sets out the requirements for design and mitigation regarding landscape and visual effects; • Paragraphs 4.9.10 to 4.9.17: The policy sets out the requirements for methodology, baseline assessment, consent in exceptional circumstances and mitigation regarding landscape character impact, nationally designated areas and visual impacts. Sections of Part 4b are within a National Landscape; • Paragraphs 4.10.10, 4.10.11 and 4.10.13: The policy sets out the requirements for methodology, baseline assessment and design relating to land use including existing open space, trees and woodland and Green Belt; • Paragraphs 4.10.17 to 4.10.21: The policy sets out the requirements for design and mitigation relating to green infrastructure and Public Rights of Way (PRoW) and access; and • Paragraphs 4.10.22 to 4.10.28: The policy sets out the requirements for design and mitigation relating to green and blue infrastructure and the Green Belt.
National Planning Policy Framework (NPPF) (Ref. 4)	• Section 12, paragraphs 135 and 139 refers to achieving well designed and beautiful places;	• Section 12, paragraphs 135 and 139: The policy sets out the requirements for design and mitigation relating to development proposals;

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	- Section 13 paragraphs 142 and 151 refers to protecting Green Belt land; - Section 13 paragraphs 153 and 154 refers to 'Protecting Green Belt land'; and - Section 15, paragraphs 187, 189 and 190 refers to conserving and enhancing the natural environment.	- Section 13, paragraphs 142 & 151: The policy sets out the requirements for design and mitigation relating to the protection and opportunities within the Green Belt; - Section 13, paragraphs 153 and 154: The policy sets out the requirements for design and mitigation relating to development within the Green Belt. Part 1a and sections of Part 1b and Part 4b of the Proposed Development are located within areas designated as Green Belt; and - Section 15, paragraph 187, 189 and 190: The policy sets out the requirements for design and mitigation relating to enhancing the natural and local environment including protecting and enhancing valued landscapes (187) and conserving and enhancing landscape and scenic beauty in National Landscapes (189). Paragraph 190 states permission for major development in National Landscapes should be refused other than in exceptional circumstances.
Planning Practice Guidance (PPG) Design Process and Tools (Ref. 5)	Sets out the importance of good design. PPG affirms how good design should follow the ten characteristics set out in the National Design Guide (Ref. 6).	The PPG provides a framework for design development. PPG advocates for design to reflect local design policies and government guidance on design, taking into account local design guidance and supplementary planning documents such as design guides and codes.
PPG Green Belt (Ref. 7)	Provides advice on the role of the Green Belt in the planning system and factors to be taken into account when considering development within Green Belt.	Part 1a and sections of Part 1b and Part 4b of the Proposed Development are located within areas designated as Green Belt.

Local Policy

- 16.2.6 The local policies listed in **Table 16-2** are both important and relevant to the scope and method of assessment of potential landscape and visual effects.

Table 16-2: List of relevant local policy – Landscape and Visual

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031(Adopted January 2017): • TP7 Green infrastructure network; • TP10 Green Belt; and • TP12 Historic environment.	Ref. 8	TP7: The policy and associated mapping set out the requirements for the assessment, design and mitigation regarding the Green Infrastructure network, including Blue Infrastructure, such as canals and rivers. TP10: The policy sets out the requirements for assessment and mitigation relating to the Green Belt. TP12: The policy sets out requirements for methodology, baseline assessment and mitigation regarding the historic environment including townscapes and landscapes.
	New Local Plan for Birmingham 2042: • CE9 Green infrastructure and nature recovery; and • CE15 Green Belt.	Ref. 9	CE9: The policy sets out requirements for the planning and implementation of the green infrastructure. CE15: The policy details the protection of the Green Belt and sets out the considerations when assessing development with the Green Belt.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033 (Adopted September 2021): • LP14 Landscape; • LP17 Green Infrastructure; and • LP22 Open Spaces and Recreational Provision.	Ref. 10	LP14: The policy sets out the requirements for baseline assessment, design and mitigation regarding landscape. LP17: The policy sets out requirements for maintaining and enhancing the green infrastructure network through development. The definition of Green Infrastructure includes “blue infrastructure and blue spaces” such as waterways, towpaths and their environs. LP22: The policy details the retention, protection and enhancement including design principles for open spaces and recreational areas, which includes the green corridors of canals

Local authority	Relevant local policy	Reference	Relevance to the assessment
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031 (Adopted June 2019): • Policy NE1 Green Infrastructure; and • Policy NE5 Landscape Character.	Ref. 11	NE1: The policy sets out requirements for design and enhancement relating to green infrastructure. NE5: The policy sets out requirements for development to respond positively to landscape character.
	Borough Plan Review 2021-2039: • Policy NE1 Green and Blue Infrastructure; • Policy NE2 Open Space and playing fields; and • Policy NE5 Landscape Character.	Ref. 12	NE1: The policy sets out requirements for design and enhancement relating to green and blue Infrastructure. NE2: The policy sets out the requirements for design and mitigation relating to Open Space and connectivity. NE5: The policy sets out requirements for methodology, baseline assessment, design and mitigation relating to Landscape Character.
Coventry City Council	Coventry Local Plan (2011-2031) (Adopted December 2017): • GE1 Green Infrastructure; • GE3 Biodiversity, Geology, Landscape and Archaeological Conservation; • GE4 Tree Protection; and • DE1 Ensuring High Quality Design.	Ref. 13	GE1: The policy sets out requirements for protection and enhancement of green infrastructure. GE3: The policy sets out requirements for protection of importance landscape features. GE4: The policy sets out requirements for protection of trees and new planting. DE1: The policy sets out requirements for design and mitigation relating to character.
	Local Plan Review (Issues and Options Consultation 2023): • GE1 Green Infrastructure;	Ref. 14	GE1: The proposal is to base the policy on the existing policy and expand it to cover woodlands, veteran trees, identifying key corridors for enhancement and connectivity, set targets for GI provision and link green space provision to health and climate vulnerability.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• GE3 Biodiversity, Geological, Landscape and Archaeological Conservation; • GE4 Tree Protection; and • DE1 Ensuring High Quality Design.		GE3: The proposal is to base the new policy on the existing policy and expand to reiterate targets for GI and GI corridors plus the importance of green features in the built environment. GE4: The proposal is to base the new policy on the existing policy and expand to increase the level of protection. DE1: The proposal is to base the new policy on the existing policy and expand to better address various challenges and key priorities including climate change and lessons from the pandemic.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031 (Adopted June 2019): • NE2 Strategic Green and Blue Infrastructure; • NE3 Landscape Protection and Enhancement; and • SDC2 Landscaping.	Ref. 15	NE2: The policy sets out requirements for protection and enhancement of a Borough wide strategic green and blue infrastructure network. NE3: The policy sets out requirements to ensure new development positively contributes to landscape character. SDC2: The policy sets out requirements for the landscape design of a development.
	Rugby Borough Local Plan review – issues and options consultation (2023): Specific policies are not identified. The document focuses on seven topics, including design coding and guidance.	Ref. 16	No specific reference that is directly relevant to the Landscape and Visual assessment.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1 (Adopted December 2014): • BN1 Green Infrastructure Connections;	Ref. 17	BN1: The policy recognises the sub-regional and local importance of the identified green infrastructure corridors and seeks to protect and enhance. BN3: The policy sets out measures for woodland enhancement and creation.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• BN3 Woodland enhancement and creation; and • BN5 The Historic Environment and Landscape.		BN5: The policy sets out measures for the protection of heritage assets and landscape.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District (Adopted February 2020): • ENV1 Landscape; • ENV2 Special Landscape Areas; • ENV3 Green Wedge; • ENV4 Green Infrastructure; • ENV6 Daventry Country Park and Grand Union Canal Link; and • ENV10 Design.	Ref. 18	ENV1: The policy sets out requirements for methodology, baseline assessment, design and mitigation regarding landscape character and visual. ENV2: The policy provides the basis of the protection of Special Landscape Areas and sets out requirements for assessing the impact of development on Special Landscape Areas. ENV3: The policy concerns the protection and enhancement of settlements within the area that fringe Daventry and Northampton, some of which are in the vicinity of Part 2. It sets out requirements for design relating to the green wedge. ENV4: The policy sets out requirements to protect, enhance and restore the district's green infrastructure assets which include the canal network. ENV6: The policy sets out requirements for design in relation to Daventry Country Park and Grand Union Canal Link within Part 3. ENV10: The policy sets out requirements for high quality design and promoting and reinforcing local distinctiveness.
	New Local Plan for West Northamptonshire 2041: • BN6 Landscapes; • BN7 Special Landscape Areas;	Ref. 19	BN6: The policy provides the basis for protection of the West Northamptonshire's landscape and sets out requirements for design.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• BN8 Green Wedge; • BN11 Trees and Woodland; • BN12 Trees and Hedgerow in Developments; • BN13 Green and Blue Infrastructure and Development; and • BN14 Green and Blue Infrastructure Corridors.		BN7: The policy provides the basis of the protection of Special Landscape Areas and sets out requirements for assessing the impact of development on Special Landscape Areas. BN8: The policy sets out the requirements to protect of the identity of the fringe settlements and avoid coalescence. BN11: The policy seeks to increase tree cover and protect existing trees. BN12: The policy seeks to retain trees and hedgerows in development and sets out requirements for design. BN13: The policy sets out requirements to sustain and enhance the green and blue infrastructure network by following best practice. BN14: The policy recognises the important of green and blue infrastructure corridors and sets out requirements to protect, enhance and create.
Milton Keynes City Council	Plan: MK 2016 – 2031 (Adopted March 2019): • NE4 Green Infrastructure; • NE5 Conserving and Enhancing Landscape Character; • D1 Designing a High-Quality Place; and • D2 Creating a Positive Character.	Ref. 20	NE4: The policy sets out requirements for green infrastructure to be protected, extended and enhanced through development. NE5: The policy sets out requirements for design and mitigation to conserve and enhance landscape character. D1: The policy sets out guidelines for creating high quality places. D2: The policy sets out requirements for development to create a positive character.
	MK City Plan 2050 Regulation 18 Consultation July 2024:	Ref. 21	CEA11: The policy sets out standards to maintain required level of green cover, tree canopy cover and protection and creation of woodland.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- CEA11 Urban Greening, Trees and Woodland; and - CEA12 Conserving and Enhancing Landscape Character / Special Landscape Areas.		CE12: The policy sets out requirements for design and mitigation to conserve and enhance landscape character and protect Special Landscape Areas.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033 (Adopted September 2021): - BE2 Design of New Development; - NE2 River and Stream Corridors; - NE3 The Chilterns AONB and setting; - NE4 Landscape character and locally important landscape; - NE8 Trees, hedgerows and woodlands; and - I1 Green Infrastructure.	Ref. 22	BE2: The policy sets out requirements for design of new development that complement the context of the EIA Scoping Boundary and consider views. NE2: The policy sets out the design requirements for conserving and enhancing the landscape value of a watercourse and its corridor. NE3: Although EIA Scoping Boundary is outside the Chiltern National Landscape, policy includes consideration of views from the National Landscape. NE4: The policy sets out requirements for methodology, baseline assessment and mitigation relating to Landscape character, locally important landscapes and visual. NE8: The policy sets out requirements to enhance and expand the tree and woodland resource. I1: The policy sets out requirements for delivering green infrastructure through development and considering its landscape value.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives (2023): Specific policies are not identified.	Ref. 23	The document focuses on eight objectives, including the natural and built environment, the quality of place and infrastructure, encompassing green and blue infrastructure to enhance the landscape.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035 (Adopted July 2021):	Ref. 24	SP4: The policy sets out requirements for design within and enhancement of the Green Belt.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• SP4 Development in the Green Belt; • EE1 Green Infrastructure; • EE4 Trees, Woodlands and Hedgerows; • EE5 Landscape Character; • EE7: The Chilterns Area of Outstanding Natural Beauty; and • EE11 The River and Waterway Network.		EE1: The policy sets out requirements for an increase in green infrastructure provision within major developments. It also identifies key Council initiatives related to green infrastructure. EE4: The policy sets out requirements retaining trees, woodlands and hedgerows within development and new planting. EE5: The policy sets out requirements to safeguard landscape character and value within the design of development. EE7: The policy sets out guidelines to protect and enhance the Chilterns National Landscape. Part 4a and the western section of Part 4b are within the setting of the National Landscape. The eastern section of Part 4b is within the National Landscape. EE11: The policy sets out requirements for design and mitigation to safeguard and enhance the character of the river and waterway network.
	New Local Plan for Central Bedfordshire: Specific policies are not identified.	Ref. 25	The document focuses on six themes, including access to new and improved green space and nature and respecting and enhancing the unique character of our towns and villages.

Guidance and Standards

16.2.7 Relevant guidance and standards which have been used as part of the scoping process are listed below and will also be taken into account as part of the EIA include:

- a. Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition (Ref. 26);
- b. An Approach to Landscape Character Assessment (Ref. 27);
- c. Assessing landscape value outside national designations, Technical Guidance Note 02/21 (Ref. 28);
- d. Visual Representation of Development Proposals, Technical Guidance Note 06/19 (Ref. 29); and
- e. Tranquillity – An overview, Technical Information Note 01/2017 (Revised) (Ref. 30).

16.3 Consultation

16.3.1 During non-statutory consultation, the following landscape and visual impact related matters were raised and will be considered as part of the scope of assessment:

- a. Impacts on local residents in relation to the Break Pressure Tank structure (part of Part 1b) and design of new canal infrastructure (Part 2);
- b. Consideration of designated landscapes including the Chilterns National Landscape, Registered Parks and Gardens and Areas of Attractive Landscape or Areas of Great Landscape Value, identified by local authorities; and
- c. Impacts on rural landscape character.

16.3.2 As part of the EIA process, consultation will be undertaken with the local planning authorities, the Chilterns Conservation Board and the Canal & River Trust to inform the assessment, including the proposed viewpoints and mitigation for the Proposed Development.

16.4 Study Area

16.4.1 This section sets out the study areas adopted for each element of the Proposed Development.

16.4.2 The extent of each study area has been informed by a review of the EIA Scoping Boundary, desk-based research, the appraisal work undertaken to date to inform the layout of the Proposed Development and the likely scale and massing of each part of the Proposed Development, knowledge of the area and professional judgement. The study areas would be further refined for the EIA to ensure a proportional approach, focussed on potential significant effects. It is judged that significant landscape and visual effects would be unlikely beyond these study areas.

- 16.4.3 Preliminary Zones of Theoretical Visibility (ZTV) were produced for Part 1a and Part 4a (Sites B and H) of the Proposed Development. These are based on outline design information and assumed heights of proposed structures and as such are intended only to provide an initial representation of potential theoretical visibility of parts of the Proposed Development. The ZTVs have been generated using a digital terrain model and includes data from the National Forest Inventory (which is modelled at a height of 10 m to take account of the screening effects of vegetation). Further ZTVs would be prepared as part of the detailed assessment stage. The preliminary ZTVs are shown on **Figure 16-4**, **Figure 16-10** and **Figure 16-11** in Volume 2 of this EIA Scoping Report.

Part 1a: Minworth AWTP

- 16.4.4 A study area of 2 km has been identified for Part 1a for the landscape and visual assessment.

Part 1b: Minworth to Atherstone Pipeline

- 16.4.5 For the pipeline corridor a study area of 1 km either side of the Part 1b EIA Scoping Boundary has been identified. A 1 km study area is also included around the proposed Break Pressure Tank adjacent to the proposed pipeline.

Part 2: Outfall and Works to the Coventry, Oxford and Grand Union Canals

- 16.4.6 A study area of 1 km either side of the Part 2 EIA Scoping Boundary for the Indicative Work Area sections of the canal has been identified for the landscape and visual assessments. The Indicative Non-Work Area sections of the Part 2 EIA Scoping Boundary are excluded from the landscape and visual assessments as no physical works are proposed to take place which could impact on the landscape or have visual impacts.

Part 3: Daventry and Drayton Reservoirs

- 16.4.7 A study area of 1 km either side of the connecting Part 3 EIA Scoping Boundary of the pipelines and inlet and outlet features of the reservoirs has been identified for the landscape and visual assessments.

Part 4a: Abstraction, Storage and Treatment

- 16.4.8 A study area of 2 km around the Part 4a EIA Scoping Boundary of both Site B and Site H has been identified for the landscape and visual assessments.

Part 4b: Pipeline to an Underground Reservoir near Luton

- 16.4.9 For the pipeline corridors a study area of 1 km either side of the Part 4b EIA Scoping Boundary for the pipeline corridors has been identified for the landscape and visual assessments.

Summary

- 16.4.10 **Table 16-3** provides a summary of the study areas by Proposed Development Part.

Table 16-3: Summary of study areas – Landscape and visual

Reference point	Study area
Part 1a: Minworth AWTP	2 km radius from Part 1a EIA Scoping Boundary.
Part 1b: Minworth to Atherstone Pipeline	1 km either side of the Part 1b EIA Scoping Boundary including the Break Pressure Tank.
Part 2: Works to the Coventry, Oxford and Grand Union Canals	1 km either side of Part 2 EIA Scoping Boundary, related to the Indicative Work Area sections only.
Part 3: Daventry and Drayton Reservoirs	1 km either side or around the Part 3 EIA Scoping Boundary.
Part 4a: Abstraction, Storage and Treatment	2 km either side of the Part 4a EIA Scoping Boundary of the reservoir and WTW.
Part 4b: Pipeline to an Underground Reservoir near Luton	1 km either side from Part 4b EIA Scoping Boundary.

16.5 Baseline Conditions

Existing Baseline

- 16.5.1 This section provides a summary of the baseline conditions in respect of the landscape and visual assessment.
- 16.5.2 After a brief description of each part of the EIA Scoping Boundary, the following are identified:
- Landscape designations: landscape can be designated at a national or local scale for their special landscape or scenic qualities;
 - Landscape character: landscape character can be defined and described at a range of scales and levels of detail. At the national level the study areas fall within various National Character Areas (NCA) as defined by Natural England. At the regional level, sections of the study areas fall within Landscape Character Types (LCT) and Landscape Character Areas (LCA) defined by local planning authorities; and
 - Visual receptors: Visual receptors are the people at locations within the study areas who would potentially be affected by changes to views or visual amenity as a result of the Proposed Development. Visual receptors can be static or dynamic and include people in their home or at work, users of recognised recreational routes, such as the canal towpaths including the Centenary Way and Oxford Canal Walk or defined PROWs, visitors to places of interest (e.g. tourist attractions, or specific viewpoints), and users of the road and transport network.
- 16.5.3 The visual assessment will be based on a series of representative viewpoints chosen to provide a cross-section of receptor types and locations

within the study areas, focused on those with the potential for significant effects.

- 16.5.4 Details of the proposed viewpoint locations are provided for each part of the Proposed Development, outlining the reasons each viewpoint has been identified for inclusion in the assessment. The locations of the proposed representative viewpoints are shown on **Figure 16-5**, **Figure 16-7** and **Figure 16-9** in Volume 2 of this EIA Scoping Report.

Part 1a: Minworth AWTP

Landscape Designations

- 16.5.5 No landscape designations have been identified within the study area.

Landscape Character

National

- 16.5.6 At a national level, the study area encompasses parts of the following NCA. These are illustrated on **Figure 16-2** in Volume 2 of this EIA Scoping Report:
- a. NCA 97: Arden (Ref. 41); and
 - b. NCA 69: Trent Valley Washlands (Ref. 42).

Regional and Local

- 16.5.7 At the regional and local level, landscape character is identified by the Birmingham City Council's PG5 Green Belt Option Areas Landscape Character Assessment Part 1 (Ref. 31) and North Warwickshire's Landscape Character Assessment (Ref. 32).
- 16.5.8 The study area encompasses parts of the following LCA. These are illustrated on **Figure 16-3** in Volume 2 of this EIA Scoping Report:

Birmingham City Council LCA:

- a. LCA 14: Peddimore Hall Lowland Basin;
- b. LCA 15: Minworth Lowland Urban Fringe; and
- c. LCA 19: Wiggins Hill Lowland Farmland.

North Warwickshire Borough Council LCA:

- a. LCA 13: Wishaw to Trickleby Coppice Wooded Uplands;
- b. LCA 12: Middleton to Curdworth Tame Valley Farmlands;
- c. LCA 11: Tame Valley Wetlands; and
- d. LCA 10: Cole Valley.

Visual Receptors

- 16.5.9 **Table 16-4** provides details of the proposed viewpoint locations for Part 1a. These are illustrated on **Figure 16-5** in Volume 2 of this EIA Scoping Report.

Table 16-4: Part 1a – Proposed viewpoint locations

Ref.	Location	Reason for inclusion
VP1	PRoW crossing King George V Playing Fields, Curdworth	Representative of views experienced by residents and recreational receptors within Curdworth to north of the Part 1a EIA Scoping Boundary.
VP2	PRoW on footbridge crossing railway line to north of Water Orton	Representative of views experienced by recreational receptors using PRoWs on edge of Water Orton and close to River Tame.
VP3	PRoW as crosses Birmingham and Fazeley Canal	Representative of views experienced by recreational receptors using PRoW to north of Part 1a EIA Scoping Boundary.
VP4	PRoW to south-west of Curdworth	Representative of views experienced by recreational receptors using PRoW and residents along southern edge of Curdworth.

Part 1b: Minworth to Atherstone Pipeline*Landscape Designations*

16.5.10 A single landscape designation is located partly within the study area as detailed below and shown on **Figure 16-7** in Volume 2 of this EIA Scoping Report:

- a. Merevale Hall Grade II* Registered Park and Garden (Ref. 51).

*Landscape Character*National

16.5.11 At a national level the study area encompasses parts of the following NCAs. These are illustrated on **Figure 16-2** in Volume 2 of this EIA Scoping Report:

- a. NCA 97: Arden (Ref. 41);
- b. NCA 69: Trent Valley Washlands (Ref. 42); and
- c. NCA 72: Mease / Sence Lowlands (Ref. 43).

Regional and Local

16.5.12 At the regional and local level, landscape character is identified in the North Warwickshire Landscape Character Assessment (Ref. 32). The study area encompasses parts of the following LCAs. These are illustrated on **Figure 16-6** in Volume 2 of this EIA Scoping Report:

- a. LCA 10: Cole Valley;
- b. LCA 12: Middleton to Curdworth Tame Valley Farmlands;
- c. LCA 11: Tame Valley Wetlands;
- d. LCA 9: Hoggrill's to Furnace End Hamlets;
- e. LCA 5: Tamworth Fringe Uplands;

- f. LCA 6: Wood End to Whitacre Upper Tame Valley Farmlands;
- g. LCA 4: Baddesley to Hartshill Uplands; and
- h. LCA 3: Anker Valley.

Visual Receptors

16.5.13 **Table 16-5** provides details of the proposed viewpoint locations for Part 1b. These are illustrated on **Figure 16-7** in Volume 2 of this EIA Scoping Report.

Table 16-5: Part 1b – Proposed Viewpoint Locations

Ref	Location	Reason for inclusion
VP5	Edge of Lea Marston as Centenary Way enters the village	Representative of views experienced by residential, road, and recreational receptors.
VP6	PRoW along northern edge of Hurley	Representative of views experienced by residential and recreational receptors along the pipeline route.
VP7	Edge of Bentley Common settlement and PRoW	Representative of views experienced by residential and recreational receptors in vicinity of the Break Pressure Tank.
VP8	PRoW over Atherstone Golf Course	Representative of views experienced by recreational receptors in vicinity of the outfall into the Coventry Canal and compound.

Part 2: Outfall and Works to the Coventry, Oxford and Grand Union Canals

Landscape Designations

16.5.14 Three Registered Parks and Gardens are identified within part of the study area as detailed below and shown on **Figure 16-9** in Volume 2 of this EIA Scoping Report:

- a. Merevale Hall Grade II* (Ref. 51);
- b. Brockhall Park Grade II (Ref. 52); and
- c. Stoke Park Grade II (Ref. 53).

16.5.15 In addition, there are local landscape designations identified in development plans by local authorities which encompass part of the study area. These are listed below and shown on **Figure 16-9** in Volume 2 of this EIA Scoping Report:

- a. Special Landscape Areas (SLA) – West Northamptonshire District Council; and
- b. Areas of Attractive Landscape (AAL) – Buckinghamshire Council.

Landscape Character

National

16.5.16 At a national level the study area encompasses parts of the following NCAs. These are illustrated on **Figure 16-2** in Volume 2 of this EIA Scoping Report:

- a. NCA 97: Arden (Ref. 41);
- b. NCA 72: Mease / Sence Lowlands (Ref. 43);
- c. NCA 94: Leicestershire Vales (Ref. 44);
- d. NCA 96: Dunsmore and Feldon (Ref. 45);
- e. NCA 95: Northamptonshire Uplands (Ref. 46);
- f. NCA 89: Northamptonshire Vales (Ref. 47);
- g. NCA 91: Yardley – Whittlewood Ridge (Ref. 48);
- h. NCA 88: Bedfordshire and Cambridgeshire Claylands (Ref. 49); and
- i. NCA 90: Bedfordshire Greensand Ridge (Ref. 50).

Regional and Local

16.5.17 At the regional and local level, landscape character is described in the following landscape character assessments:

- a. North Warwickshire Landscape Character Assessment (Ref. 32);
- b. Nuneaton and Bedworth Landscape Character Assessment (Ref. 33);
- c. Coventry Green Infrastructure Study (Ref. 34);
- d. Landscape Assessment of the Borough of Rugby – Sensitivity and Condition Study (Ref. 35);
- e. Daventry Landscape Character Assessment (Ref. 36);
- f. South Northamptonshire Landscape Character Assessment (Ref. 37);
- g. Milton Keynes Landscape Character Assessment (Ref. 38);
- h. Aylesbury Vale Landscape Character Assessment (Ref. 39); and
- i. Central Bedfordshire Landscape Character Assessment (Ref. 40).

16.5.18 The study area encompasses parts of the following LCTs and LCAs. These are illustrated on **Figure 16-8** in Volume 2 of this EIA Scoping Report:

North Warwickshire Borough Council:

- a. LCA 3: Anker Valley; and
- b. LCA 4: Baddesley to Hartshill Uplands.

Nuneaton and Bedworth Borough Council:

- a. LCA 1: Hartshill Ridge;
- b. LCA 2: Anker Valley Estate Farmlands;
- c. LCA 13: Whittleford Park and Bar Pool River Valley; and

- d. LCA 6: Nuneaton and Bedworth Urban Fringes.

Coventry City Council:

- a. LCT 1: Industrial Arden; and
- b. LCT 2: Urban.

Rugby Borough Council:

- a. LCT 5 Aia: Arden, Industrial Arden;
- b. LCT 8 Hvf: High Cross Plateau, Village Farmlands;
- c. LCT 3 Dp: Dunsmore Parklands;
- d. LCT 7 Hop: High Cross Plateau, Open Plateau;
- e. LCT 2 Dpf: Dunsmore, Plateau Fringe;
- f. LCT 5 Fvf: Feldon, Vale Farmlands;
- g. LCT 1: Dpfa: Dunsmore, Plateau Farmlands; and
- h. LCT 4 Fif: Feldon, Ironstone Fringe.

Daventry District Council:

- a. LCT 19: Broad Unwooded Vale;
- b. LCT 14: Rolling Agricultural Lowlands;
- c. LCT 13: Undulating Hills and Valleys;
- d. LCT 18: Broad River Valley Floodplain;
- e. LCA 19b: Vale of Rugby;
- f. LCA 13b: Daventry;
- g. LCA 14a: Newbold Grounds;
- h. LCA 18a: The Nene - Long Buckby to Weedon Bec;
- i. LCA 13c: Long Buckby; and
- j. LCA 13a: Woodford Halse and Weedon Bec.

South Northamptonshire District Council:

- a. LCT 13: Undulating Hills and Valleys;
- b. LCT 10: Limestone Plateau;
- c. LCT 6: Undulating Claylands; and
- d. LCT 17: River Valley Floodplain.

Milton Keynes Council:

- a. LCT 3: River Floodplains;

- b. LCT 2: Undulating Valley Slopes;
- c. LCT 5: Clay Vales;
- d. LCA 3c: Ouse Lakes and Parkland Floodplains;
- e. LCA 2c: Tove Undulating Valley Slopes;
- f. LCA 3d: Ouzel Parkland Floodplains; and
- g. LCA 5b: Upper Ouzel Clay Vale.

Aylesbury Vale District Council:

- a. LCA 4.9: Newton Longville-Stoke Hammond Claylands;
- b. LCA 5.2: Ouzel Valley;
- c. LCA 5.3: Ouzel Valley Lower Slopes;
- d. LCA 6.1: Brickhills Scarp;
- e. LCA 6.2: Stockgrove Wooded Slopes;
- f. LCA 4.11: Mursley - Soulbury Claylands; and
- g. LCA 8.3: Ouzel Valley Catchment.

Central Bedfordshire District Council:

- a. LCA 6A: Woburn Greensand Ridge;
- b. LCA 7B: Ouzel Greensand Valley;
- c. LCA 5A: Eaton Bray Clay Vale;
- d. LCA 8A: Cranfield to Stagsden; and
- e. LCA 8B: Billington Clay Hills.

Visual Receptors

16.5.19 **Table 16-6** provides details of the proposed viewpoint locations for Part 2 of the Proposed Development. These are illustrated on **Figure 16-9** in Volume 2 of this EIA Scoping Report.

Table 16-6: Part 2 – Proposed Viewpoint Locations

Ref	Location	Reason for inclusion
VP8	PRoW over Atherstone Golf Course. See Figure 16-9, Sheet A.	Representative of views experienced by recreational receptors in vicinity of potential bank raising along the canal.
VP9	Centenary Way / Oxford Canal Walk at Hawkesbury Junction. See Figure 16-9, Sheet B.	Representative of views experienced by recreational and residential receptors including boaters with potential views of pumping station and potential bank raising. Also, where the Coventry and Oxford

Ref	Location	Reason for inclusion
		canals meet and are adjacent to the Hawkesbury Junction Conservation Area.
VP10	Oxford Canal Walk at Coventry Cruising Club, Alderman's Green. See Figure 16-9, Sheet B.	Representative of views experienced by recreational receptors including boaters with potential views of the bridge works and potential bank raising.
VP11	Oxford Canal Walk to north of Ansty Bridge, B4065. See Figure 16-9, Sheet B.	Representative of views experienced by recreational and residential receptors including boaters with potential views of bridge works and potential bank raising.
VP12	Centenary Way close to Bridge 26, Brinklow, Rugby. See Figure 16-9, Sheet B.	Representative of views from bridge over railway experienced by recreational receptors with potential views of bridge works and potential bank raising.
VP13	Oxford Canal Walk north of Bridge 43 carrying Cathiron Lane. See Figure 16-9, Sheet C.	Representative of views experienced by recreational receptors including boaters with potential views of bridge works, potential bank raising and works compound.
VP14	Oxford Canal Walk, Hilmorton Locks. See Figure 16-9, Sheet C.	Representative of views experienced by recreational and residential receptors including boaters with potential views of pumping station (Part 3) and potential bank raising.
VP15	Jurassic Way PRow leading from village of Braunston to the north-east of Braunston Lock. See Figure 16-9, Sheet D.	Representative of views experienced by recreational and residential receptors with potential views of pumping station.
VP19	Road leading to Long Buckby Wharf and Oxford Canal Walk. See Figure 16-9, Sheet D.	Representative of views experienced by recreational and residential receptors including boaters with potential views of construction areas and gravity bypass at Lock 8 Whilton Lock.
VP20	Grand Union Canal Walk north of Nether Heyford road bridge. See Figure 16-9, Sheet E.	Representative of views experienced by recreational receptors including boaters with potential views of bridge works and potential bank raising.
VP21	PRow leading from Grade II Registered Park and Garden Stoke Park. See Figure 16-9, Sheet F.	Representative of view experienced by recreational receptors with potential views of gravity bypass works and construction compound.
VP22	Grand Union Canal Walk close to Stoke Bruerne See Figure 16-9, Sheet F.	Representative of view experienced by recreational receptors including boaters with potential views of gravity bypass works at series of locks

Ref	Location	Reason for inclusion
VP23	Grand Union Canal Walk at Cosgrove Lock See Figure 16-9, Sheet G.	Representative of views experienced by recreational and residential receptors including boaters located opposite gravity bypass location.
VP24	Grand Union Canal Walk opposite Red Lion Public House, Fenny Lock, Fenny Stratford. See Figure 16-9, Sheet H.	Representative of views experienced by recreational receptors including boaters located opposite and adjacent to the pumping station location.
VP25	Grand Union Canal Walk approaching Stoke Hammond within area designated as Area of Great Landscape Value. See Figure 16-9, Sheet H.	Representative of views experienced by recreational receptors including boaters with potential views of pumping stations.
VP26	Grand Union Canal Walk and Three Locks Public House, Three Locks. Within area designated as Area of Great Landscape Value. See Figure 16-9, Sheet H.	Representative of views experienced by recreational receptors including boaters opposite site of pumping station including the inlet weir.
VP27	Grand Union Canal Walk and NCN Route 6 at Leighton Lock. See Figure 16-9, Sheet I.	Representative of views experienced by recreational receptors including boaters adjacent to the new pumping station (same side of canal).

Part 3: Daventry and Drayton Reservoirs

Landscape Designations

16.5.20 No landscape designations have been identified within the study area.

Landscape Character

National

16.5.21 At a national level the study area encompasses part of the following NCA. This is illustrated on **Figure 16-2** in Volume 2 of this EIA Scoping Report:

- a. NCA 95: Northamptonshire Uplands (Ref. 46).

Regional and Local

16.5.22 At the regional and local level landscape character is described in the Daventry Landscape Character Assessment (Ref. 36). The study area encompasses parts of the following LCTs and LCAs. These are illustrated on **Figure 16-8** in Volume 2 of this EIA Scoping Report:

Daventry District Council:

- a. LCT 19: Broad Unwooded Vale;

- b. LCT 14: Rolling Agricultural Lowlands;
- c. LCT 13: Undulating Hills and Valleys;
- d. LCA 19b: Vale of Rugby;
- e. LCA 14a: Newbold Grounds; and
- f. LCA 13b: Daventry.

Visual Receptors

16.5.23 **Table 16-7** provides details of the proposed viewpoint locations for Part 3. These are illustrated on **Figure 16-9, Sheet D** in Volume 2 of this EIA Scoping Report.

Table 16-7: Part 3 – Proposed viewpoint locations

Ref	Location	Reason for inclusion
VP15	Jurassic Way PRow leading from village of Braunston to the north-east of Braunston Lock.	Representative of views experienced by recreational and residential receptors at location of pumping station in Part 2 and pipeline connection in Part 3.
VP16	Footpath and NCN 50 along disused railway line.	Representative of views experienced by recreational receptors at location of pipeline along disused railway line.
VP17	Footpath in Daventry Country Park.	Representative of views experienced by recreational receptors looking towards the location of an existing structure at Daventry Reservoir, which will be upgraded.
VP18	Footpath close to Drayton Sailing Club.	Representative of views experienced by recreational receptors using Drayton Reservoir.

Part 4a: Abstraction, Storage and Treatment

Landscape Designations

16.5.24 No landscape designations have been identified within the study area for Site B. One Registered Park and Garden is identified within part of the study area for Site H as detailed below and shown on **Figure 16-9** in Volume 2 of this EIA Scoping Report:

- a. Mentmore Towers Grade II* (Ref. 59).

16.5.25 In addition, there are local landscape designations identified in development plans by local authorities which encompass part of the study area for both Sites B and H. These are listed below and shown on **Figure 16-9** in Volume 2 of this EIA Scoping Report:

- a. AAL – Designated by Buckinghamshire Council (Ref. 22).

Landscape Character

National

16.5.26 At a national level the study area for Site B encompasses part of the following NCAs. These are illustrated on **Figure 16-2** in Volume 2 of this EIA Scoping Report:

- a. NCA 88: Bedfordshire and Cambridgeshire Claylands (Ref. 49); and
- b. NCA 90: Bedfordshire Greensand Ridge (Ref. 50).

16.5.27 The study area for Site H encompasses part of the following NCAs. These are illustrated on **Figure 16-2** in Volume 2 of this EIA Scoping Report:

- a. NCA 88: Bedfordshire and Cambridgeshire Claylands (Ref. 49); and
- b. NCA 90: Bedfordshire Greensand Ridge (Ref. 50).

Regional and Local

16.5.28 At the regional and local level, landscape character is described in the following landscape character assessments for Sites B and H:

- a. Milton Keynes Landscape Character Assessment (Ref. 38);
- b. Aylesbury Vale Landscape Character Assessment (Ref. 39); and
- c. Central Bedfordshire Landscape Character Assessment (Ref. 40).

16.5.29 The study area for Sites B and H encompass parts of the following LCTs and LCAs. These are illustrated on **Figure** in Volume 2 of this EIA Scoping Report:

Milton Keynes Council:

- a. LCT 3: River Floodplains;
- b. LCT 5: Clay Vales;
- c. LCT 6: Wooded Greensand Ridge;
- d. LCA 3d: Ouzel Parkland Floodplains;
- e. LCA 5b: Upper Ousel Clay Vale; and
- f. LCA 6a: Brickhill Wooded Greensand Ridge.

Aylesbury Vale District Council:

- a. LCA 4.9: Newton Longville-Stoke Hammond Claylands;
- b. LCA 4.14: Wingrave-Mentmore Ridge;
- c. LCA 5.2: Ouzel Valley;
- d. LCA 5.3: Ouzel Valley Lower Slopes;
- e. LCA 6.1: Brickhills Scarp;
- f. LCA 6.2: Stockgrove Wooded Slopes;
- g. LCA 8.3: Ouzel Valley Catchment;
- h. LCA 8.4: Pitstone-Edlesborough Slopes; and

- i. LCA 8.7: Cheddington Vale.

Central Bedfordshire District Council:

- a. LCA 5A: Eaton Bray Clay Vale; and
b. LCA 8B: Billington Clay Hills.

Visual Receptors

16.5.30 **Table 16-8** provides details of the proposed viewpoint locations for Part 4a of the Proposed Development. These are illustrated on **Figure 16-9** in Volume 2 of this EIA Scoping Report.

Table 16-8: Part 4a – Proposed viewpoint locations

Ref	Location	Reason for inclusion
VP28	Bridleway along southern edge of new residential development. See Figure 16-9, Sheet H.	Representative of views experienced by recreational and residential receptors with potential views of reservoir and water treatment works at Site B.
VP29	Footpath on west edge of Little Brickhill village. See Figure 16-9, Sheet H.	Representative of views experienced by recreational and residential receptors with potential views of reservoir and water treatment works at Site B.
VP30	Milton Keynes Boundary Walk along Mill Lanes. See Figure 16-9, Sheet H.	Representative of views experienced by recreational and road receptors with potential views of reservoir and water treatment works at Site B.
VP31	Footpath beside St. Luke's Church, Stoke Hammond. See Figure 16-9, Sheet H.	Representative of views experienced by recreational and residential receptors with potential views of reservoir and water treatment works at Site B.
VP32	Footpath along the River Ouzel. See Figure 16-9, Sheet J.	Representative of views experienced by recreational receptors with potential views of reservoir and water treatment works at Site H.
VP33	Recreation ground on western edge of Slapton. See Figure 16-9, Sheet J.	Representative of views experienced by recreational and residential receptors with potential views of reservoir and water treatment works at Site H.
VP34	Junction of footpath and B488 at Horton. See Figure 16-9, Sheet J.	Representative of views experienced by recreational, road and residential receptors with

Ref	Location	Reason for inclusion
		potential views of reservoir and water treatment works at Site H.
VP35	Footpath along edge of Mentmore Towers registered park and garden. See Figure 16-9, Sheet J .	Representative of views experienced by recreational receptors with potential views of reservoir and water treatment works at Site H.

Part 4b: Pipeline to an Underground Reservoir near Luton

Landscape Designations

16.5.31 The Chilterns National Landscape and one Registered Parks and Gardens are identified within part of the study area as detailed below and shown on **Figure 16-9** in Volume 2 of this EIA Scoping Report:

- a. Battlesden Park Grade II (Ref. 60).

16.5.32 In addition, there are local landscape designations identified in development plans by local authorities which encompass part of the study area. These are listed below and shown on **Figure 16-9** in Volume 2 of this EIA Scoping Report:

- a. AAL – Designated by Buckinghamshire Council (Ref. 22).

Landscape Character

National

16.5.33 The study area for Part 4b encompasses part of the following NCAs. These are illustrated on **Figure 16-2** in Volume 2 of this EIA Scoping Report:

- a. NCA 88: Bedfordshire and Cambridgeshire Claylands (Ref. 49);
- b. NCA 90: Bedfordshire Greensand Ridge (Ref. 50); and
- c. NCA 110: Chilterns (Ref. 61).

Regional and Local

16.5.34 At the regional and local level, landscape character is described in the following landscape character assessments for Part 4b:

- a. Milton Keynes Landscape Character Assessment (Ref. 38);
- b. Aylesbury Vale Landscape Character Assessment (Ref. 39);
- c. Central Bedfordshire Landscape Character Assessment (Ref. 40); and
- d. Luton Borough Landscape Character Assessment (Ref. 62).

16.5.35 The study area encompasses parts of the following LCTs and LCAs. These are illustrated on **Figure 16-8** in Volume 2 of this EIA Scoping Report:

Milton Keynes Council:

- a. LCT 3: River Floodplains;

- b. LCT 5: Clay Vales;
- c. LCT 6: Wooded Greensand Ridge;
- d. LCA 3d: Ouzel Parkland Floodplains
- e. LCA 5b: Upper Ouzel Clay Vale; and
- f. LCA 6a: Brickhill Wooded Greensand Ridge.

Aylesbury Vale District Council:

- a. LCA 5.2: Ouzel Valley;
- b. LCA 5.3: Ouzel Valley Lower Slopes;
- c. LCA 6.1: Brickhills Scarp;
- d. LCA 6.2: Stockgrove Wooded Slopes;
- e. LCA 8.3: Ouzel Valley Catchment;
- f. LCA 8.4: Pitstone-Edlesborough Slopes; and
- g. LCA 10.2: Ivinghoe Foothills.

Central Bedfordshire District Council:

- a. LCA 5A: Eaton Bray Clay Vale;
- b. LCA 6A: Woburn Greensand Ridge;
- c. LCA 8A: Toddington-Hockliffe Clay Hills;
- d. LCA 8B: Billington Clay Hills;
- e. LCA 9A: Dunstable Downs Chalk Escarpment;
- f. LCA 9B: Totternhoe Chalk Escarpment;
- g. LCA 9E: South Dunstable Chalk Escarpment;
- h. LCA 10A: Totternhoe-Dunstable Downs Rolling Farmland
- i. LCA 11A: Whipsnade Chalk Dipslope;
- j. LCA 11B: Caddington-Slip End Chalk Dipslope;
- k. LCA 12B: Ver Chalk Valley; and
- l. LCA 12C: Slip End Chalk Valley.

Luton Borough Council

- a. LCA 1b: Lewsey South;
- b. LCA 5: Western Transit Corridor;
- c. LCA 19a: Dallow Downs Valley Side; and
- d. LCA 21: Farley Hill Plateau.

Visual Receptors

16.5.36 **Table 16-9** provides details of the proposed viewpoint locations for Part 4b of the Proposed Development. These are illustrated on **Figure 16-9** in Volume 2 of this EIA Scoping Report.

Table 16-9: Part 4b - Proposed viewpoint locations

Ref	Location	Reason for inclusion
VP36	Footpath on hill through Battlesden Park, registered park and garden. See Figure 16-9, Sheet H.	Representative of views experienced by recreational receptors with potential views of the pipeline routes SP2, SP2A and SP2B.
VP37	Footpath on Castle Hill, Lower End. See Figure 16-9, Sheet I.	Representative of views experienced by recreational receptors with potential views of the pipeline routes SP2, SP6, SP7 and SP10.
VP38	Car park on Dunstable Downs, near to Visitor Centre. See Figure 16-9, Sheet J.	Representative of views experienced by recreational and road receptors with potential views of the pipeline routes SP5 and SP10.
VP39	Junction of footpath with Beech Road. See Figure 16-9, Sheet K.	Representative of views experienced by recreational and road receptors with potential views of the pipeline routes SP10 and SP10B.

Future Baseline

16.5.37 It is not anticipated that the future baseline will be significantly different from the existing baseline. However, the EIA will consider future baseline conditions of the landscape character and visual amenity within the study area for the relevant assessment year which is likely to be during the peak construction period as well as during the anticipated full build out year (2032).

16.6 Potential Effects

Construction Phase

All Parts

16.6.1 Potential landscape and visual impacts related to the construction phase of the Proposed Development for all Parts may arise from the following:

- a. Temporary physical change to the landscape as a result of site clearance, the movement of vehicles and activities associated with the construction phase, temporary structures such as construction compounds, and other elements such as temporary access tracks;
- b. Temporary indirect change to the qualities of the designated landscapes and, and direct and/or indirect change to the locally designated landscapes as a result of the construction phase activities;

- c. Temporary change to physical and perceptual characteristics of LCAs as a result of the construction phase activities; and
- d. Temporary disruption to views and visual amenity due to construction phase vehicles and equipment, other activities associated with the construction phase, and introduction of construction compounds, temporary accommodation, and access tracks.

16.6.2 A summary of the scoping of potential effects from the Proposed Development during the construction phase is provided within **Table 16-10** below.

Table 16-10: Potential effects during the construction phase – Landscape and Visual Amenity

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Physical and perceptual aspects of the landscape designations and LCAs within the study areas.	In	All	Temporary effects on physical and perceptual aspects of the landscape designations and LCAs within the study areas as a result of activities associated with construction, vegetation loss, temporary structures and other elements. There are sensitive landscape receptors as represented by designated landscapes and LCAs within the study areas for all Parts of the Proposed Development, as such the assessment of landscape character has been scoped into the EIA.
Visual effects on visual receptors, based on identified representative views.	In	All	Temporary effects on visual receptors, based on identified representative viewpoints (VP1 to VP39). There are sensitive visual receptors within the study areas and where applicable ZTV extent for all Parts of the Proposed Development, as such the assessment of visual amenity has been scoped into the EIA.

Operational Phase

16.6.3 The following section outlines the potential impacts of different elements of the Proposed Development during the operational phase.

Part 1a: Minworth AWTP

- 16.6.4 Potential landscape and visual impacts resulting from the operational phase of the proposed Minworth AWTP may arise from the following:
- a. Change to the physical landscape resulting from loss of existing landscape elements, the alteration of existing topography and/or the introduction of new buildings, structures and infrastructure;
 - b. Change to physical and perceptual aspects of landscape character as a result of the introduction of new buildings, structures and infrastructure; and
 - c. Change to views experienced by residential and recreational receptors, and road users due to introduction of new buildings, structures and infrastructure.

Part 1b: Minworth to Atherstone Pipeline

- 16.6.5 Potential landscape and visual impacts resulting from the operational phase of the proposed pipeline and installation of the Break Pressure Tank are likely to be limited to change resulting from localised loss of trees and hedgerows during the construction phase. In order to ensure a proportionate approach focused on potential for significant effects, operational stage impacts relating to the proposed Minworth to Atherstone Pipeline would be largely scoped out of the assessment. A visual assessment of the operational stage impact of the Break Pressure Tank is scoped in.

Part 2: Outfall and Works to the Coventry, Oxford and Grand Union Canals

- 16.6.6 Potential landscape and visual impacts resulting from the operational phase of the works to the Coventry, Oxford and Grand Union Canals may arise from the following:
- a. Change to the physical landscape resulting from loss of existing landscape elements, the alteration of existing topography and/or changes to existing structures and infrastructure;
 - b. Change to physical and perceptual aspects of landscape character and landscape designations, as a result of alteration of existing topography and/or changes to existing structures and infrastructure; and
 - c. Change to views experienced by residential and recreational receptors, including canal and towpath users, boaters, marinas, and road users due to alteration of existing topography and/or changes to existing structures and infrastructure.

Part 3: Daventry and Drayton Reservoirs

- 16.6.7 Potential landscape and visual impacts resulting from the operational phase of the proposed pipelines and discharge structures for both the reservoirs and canal are likely to be limited to change resulting from localised loss of vegetation during the construction phase. In order to ensure a proportionate approach focused on potential for significant effects, operational stage

impacts relating to Proposed Development at the Daventry and Drayton Reservoirs would be largely scoped out of the assessment.

Part 4a: Abstraction, Storage and Treatment

16.6.8 Potential landscape and visual impacts resulting from the operational phase of the abstraction from the canal, pipeline to proposed WTW and storage may arise from the following:

- a. Change to the physical landscape resulting from loss of existing landscape elements, the alteration of existing topography and/or the introduction of new buildings, structures and infrastructure;
- b. Change to physical and perceptual aspects of landscape character and landscape designations, as a result of introduction of new buildings, structures and infrastructure; and
- c. Change to views experienced by residential and recreational receptors, and road users due to introduction of new buildings, structures and infrastructure.

Part 4b: Pipeline to an Underground Reservoir near Luton

16.6.9 Potential landscape and visual impacts resulting from the operational phase of the proposed pipeline are likely to be limited to change resulting from localised loss of trees and hedgerows. In order to ensure a proportionate approach focused on potential for significant effects, operational stage impacts relating to the proposed pipeline would be largely scoped out of the assessment.

16.6.10 A summary of the scoping of potential effects from the Proposed Development during the operational phase is provided within **Table 16-11** below.

Table 16-11: Potential effects during the operational phase – Landscape and Visual Amenity

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Physical and perceptual aspects of the landscape designations and LCAs within the study areas	In	Parts 1a, 2, 3, 4a and sections of 4b within the National Landscape	Effects resulting from permanent structures, vegetation loss and/or earthworks. Assessment limited to targeted consideration of effects that are permanent and where reinstatement during the construction phase is not feasible. There are sensitive landscape receptors as represented by designated landscapes and LCAs within the study areas for all parts of the Proposed Development, as such the assessment of landscape

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			character has been scoped into the EIA.
	Out	Parts 1b, and sections of 4b outside the National Landscape	The assessment of pipelines outside the National Landscape (Parts 1b and sections of Part 4b) are scoped out as majority will be underground and reinstated as part of the construction phase. Landscape effects would also be outside the extent of the study areas.
Visual effects on visual receptors, based on identified representative views	In	Parts 1a, 1b (Break Pressure Tank only), 2, 3, 4a, and sections of Part 4b within the National Landscape	Visual effects resulting from permanent structures, vegetation loss and/or earthworks based on identified representative viewpoints (VP1 to VP39). There are sensitive visual receptors within the study areas and where applicable ZTV extent for Parts 1a, 2, 3, 4a and 4b of the Proposed Development, as such the assessment of visual amenity has been scoped into the EIA.
	Out	Parts 1b except for the Break Pressure Tank, and sections of the Part 4b outside the National Landscape	The assessment of the pipelines (Parts 1b and Part 4b) are scoped out, as majority will be underground and reinstated as part of the construction phase. Visual effects would be outside the extent of the study areas.
	Out	All	A separate night-time assessment is scoped out due to anticipated limited lighting associated with the Proposed Development.

16.7 Approach to Assessment

Establishing Baseline Conditions

- 16.7.1 The first step in the landscape and visual impact assessment (LVIA) process is to establish the existing conditions of the landscape and visual resource in the vicinity of the Proposed Development. This is achieved through a combination of desk and field-based study and provides the basis against which proposed change is measured.

- 16.7.2 Desk-based research involves review and analysis of a range of information, including the following:
- a. Ordnance Survey (OS) mapping, and aerial photography;
 - b. OS Digital Terrain Model (DTM);
 - c. Relevant national, regional, and local planning policy and guidance;
 - d. NCAs; and
 - e. Published regional landscape character assessments.
- 16.7.3 Initial field survey has been undertaken to help inform input into the EIA Scoping Report and initial design development. A further programme of site survey will be undertaken as part of the LVIA process in order to test the findings of desk-based research, help further refine and inform a detailed understanding of the existing baseline conditions and guide further design evolution.
- 16.7.4 Identification and characterisation of landscape character units for use in the assessment will be informed by review of published landscape character studies and other information sources listed above, in combination with observations made in the field.
- 16.7.5 Consultation will be held with relevant local planning authorities and statutory consultees early in the LVIA process. This will help to inform refinement of the location of representative viewpoints that will form the basis of the visual assessment; and, to agree the approach to mitigation measures and landscape reinstatement.

Assessment Methodology

- 16.7.6 The landscape and visual assessment will be carried out in accordance with the following good practice guidance documents:
- a. Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition ('GLVIA3') (Ref. 26);
 - b. An Approach to Landscape Character Assessment (Ref. 27);
 - c. Assessing landscape value outside national designations, Technical Guidance Note 02/21 (Ref. 28);
 - d. Visual Representation of Development Proposals, Technical Guidance Note 06/19 (Ref. 29);
 - e. Tranquillity – An overview, Technical Information Note 01/2017 (Revised) (Ref. 30); and
 - f. Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3), Technical Guidance Note 01/24 (Ref. 56).
- 16.7.7 GLVIA3 places a strong emphasis on the importance of professional judgement in identifying and defining the significance of landscape and visual effects. The LVIA will be undertaken by Chartered Landscape

Architects (CLA) with experience in the assessment of similar types of development to the Proposed Development. Professional judgement will be used in combination with structured methods and criteria to evaluate landscape and visual value and susceptibility, the resulting sensitivity, magnitude and significance of effect.

- 16.7.8 The following section summarises the methodology for the LVIA which builds on the general assessment methodology presented in **Chapter 6: EIA Approach**. For clarity and in accordance with good practice, the assessment of potential effects on landscape character and visual amenity, although closely related, are undertaken separately.

Assessment Criteria

Sensitivity of Receptors

Landscape

- 16.7.9 Landscape receptors are described as components of the landscape that are likely to be affected by the Proposed Development. These can include overall character and key characteristics, individual elements or features and specific aesthetic or perceptual aspects. It is the interaction between the different components of the Proposed Development and these landscape receptors which has potential to result in landscape effects (both adverse and beneficial).
- 16.7.10 The sensitivity of the landscape receptor is a combination of the value of the landscape (undertaken as part of the baseline study) and the susceptibility to change of the receptor to the specific type of development being assessed.
- 16.7.11 Landscape value is frequently addressed by reference to international, national, regional and local designations, determined by statutory bodies and planning agencies. Absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The evaluation of landscape value will be undertaken considering the following factors and classified as high, medium or low with evidence provided as to the basis of the evaluation:
- a. Landscape quality and condition – measure of the physical state of the landscape including the intactness of the landscape and the condition of individual elements;
 - b. Scenic quality – level of visual and sensory appeal of the landscape;
 - c. Perceptual aspects – extent that the landscape receptor is recognised for its perceptual qualities (e.g. remoteness or tranquillity);
 - d. Rarity – presence of unusual elements or features;
 - e. Representativeness – presence of particularly characteristic features;
 - f. Recreation – extent that recreational activities contribute to the landscape receptor; and

- g. Association – extent that cultural or historical associations contribute to the landscape receptor.

16.7.12 Landscape susceptibility relates to the ability of a particular landscape to accommodate the Proposed Development. It is appraised through consideration of the baseline characteristics of the landscape, and in particular, the scale or complexity of a given landscape. The evaluation of landscape susceptibility will be defined as high, medium, low or very low and will be supported by a clear explanation based upon the analysis of the landscape receptor and the extent to which it is able to accommodate the type of change proposed, specific to the Proposed Development.

16.7.13 The overall sensitivity assessment of the landscape receptor is made by employing professional judgement to combine and analyse the identified value and susceptibility with overall levels given from high, medium, low to very low.

16.7.14 **Table 16-12** presents the sensitivity criteria for landscape receptors.

Table 16-12: Sensitivity of Landscape Receptors

Aspect	Higher Sensitivity	Lower Sensitivity
Value	A designated landscape (National Park, National Landscape, National Scenic Area, World Heritage Site) or a landscape in very good condition, exceptional scenic quality and high recreational opportunities or a high degree of rarity.	Landscapes containing few if any notable elements or features, of poor condition or containing several detracting features and limited aesthetic qualities. Landscapes which are not formally designated.
Susceptibility	Attributes that make up the character of the landscape which offer very limited opportunities to accommodate change of the type proposed without fundamentally altering key characteristics.	Attributes that make up the character of the landscape which are tolerant of a large degree of the type of change proposed without fundamentally altering the key characteristics.

Visual

16.7.15 Sensitivity of visual receptors is defined through appraisal of the viewing expectation, or value placed on the view as identified in the baseline study, and its susceptibility to change.

16.7.16 The value of a view is an appraisal of the value attached to views and is often informed by the appearance on Ordnance Survey or tourist maps and in guidebooks, literature, art, or as identified in policy. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view and its scenic quality is also an indicator. The value of the view is classified as high, medium or low and will be supported by evidenced and professional judgement.

- 16.7.17 The susceptibility of visual receptors is a function of the occupation or activity of people experiencing the view and the extent to which their attention or interest is focussed on the view and the visual amenity they experience at a particular location. For example, residents in their home, boaters (residential and recreational) and towpath users, walkers whose interest may tend to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience, may indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport where views are not important or at their place of work could be considered less susceptible to change.
- 16.7.18 As with landscape susceptibility, judgements about the susceptibility of visual receptors are described as high, medium, low or very low using consistent and reasoned judgements.
- 16.7.19 The overall sensitivity assessment of the visual receptor is determined by employing professional judgement to combine and analyse the identified value and susceptibility on a scale from high, medium, low to very low. The basis of the assessment is made clear in the evaluation of each visual receptor.
- 16.7.20 **Table 16-13** presents the sensitivity criteria for visual receptors.

Table 16-13: Sensitivity of Visual Receptors

	Higher Sensitivity	Lower Sensitivity
Value	Views protected by designation, or nationally recognised, or recorded on maps/guidebooks or with cultural associations. Views that have high scenic qualities relating to the content and composition of the view.	Views which are not documented or protected with minimal or no cultural associations. Views that exhibit low scenic qualities relating to the content and composition of the view.
Susceptibility	Viewers whose attention or interest is focussed on their surroundings.	People whose attention or interest is not focussed on their surroundings and where the view is incidental to their enjoyment.

Magnitude of Impacts

Landscape

- 16.7.21 Magnitude of landscape impact refers to the extent to which the Proposed Development would alter the existing characteristics of the landscape. It is an expression of the size or scale of change to the landscape, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- a. The extent of existing landscape elements that would be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;
- b. The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones;
- c. Whether the impact alters the key characteristics of the landscape, which are integral to its distinctive character;
- d. The geographic area over which the impact will be felt (within the EIA Scoping Boundary itself, the immediate setting, at the scale of the landscape character area, on a larger scale influencing several landscape character areas); and
- e. The duration of the change short-term, medium-term or long-term, and its reversibility (whether it is permanent, temporary or partially reversible).

16.7.22 An overall assessment of the magnitude of landscape impact resulting from the Proposed Development on the landscape receptor is made by combining the above judgements using desk and field-based evidence, and professional judgement. The levels of magnitude of impact are described as being high, medium, low, very low and are defined below.

16.7.23 **Table 16-14** presents the magnitude of change criteria for landscape receptors.

Table 16-14: Magnitude of Change – Landscape Receptors

Magnitude	Criteria
High	Large alteration to the landscape receptor or may impact an extensive area or unique characteristics at a local level. May be longer-term impacts, permanent or reversible.
Medium	Partial alteration to the landscape receptor or may impact a wide area or characteristics at a local level. May be medium-term impacts, permanent or reversible.
Low	Slight alteration to the landscape receptor or may impact a restricted area and few key characteristics. May be short- to medium-term impacts, permanent or reversible.
Very Low	Very slight alteration to the landscape receptor or may impact a limited area or no key characteristics. May be short-term impacts, permanent or reversible.
None	No change to the landscape receptor.

Visual

16.7.24 Magnitude of visual impact relates to the extent to which the Proposed Development would alter the existing view and is an expression of the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- a. The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by Proposed Development;
- b. The degree of contrast or integration of any new features or changes in the form, scale, composition and focal points of the view;
- c. The nature of the view of the Proposed Development in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpsed;
- d. The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the Proposed Development and the extent of the area over which the changes would be visible; and
- e. The duration of the change short-term, medium-term or long-term and its reversibility (whether it is permanent, temporary or partially reversible).

16.7.25 An overall assessment of the magnitude of visual impact resulting from the Proposed Development on the visual receptor is made combining the above judgements using desk and field-based evidence and professional judgement. The levels of magnitude of impact are described as being high, medium, low, very low and are defined below.

16.7.26 **Table 16-15** presents the magnitude of change criteria for landscape receptors.

Table 16-15: Magnitude of Change – Visual Receptors

Magnitude	Criteria
High	A pronounced change to the composition of the view or change that may be viewed in the foreground or directly. May be longer-term impacts, permanent or reversible.
Medium	A noticeable change to the composition of the view or change that may be viewed in the middle ground or indirectly. May be medium-term impacts, permanent or reversible.
Low	An unobtrusive change in the composition of the view or change that may be viewed in the background or obliquely. May be short- to medium-term impacts, permanent or reversible.
Very Low	A barely perceptible change in the composition of the view or change that may be viewed in the background and/or very obliquely. May be short-term impacts, permanent or reversible.
None	No change to the view.

Effect Significance

16.7.27 Determination of the significance of landscape and visual effects will be undertaken by professional judgement and experience to combine and analyse the magnitude of change against the identified sensitivity of the receptor. The assessments will take account of direct and indirect change on

existing landscape elements, features, key characteristics and evaluates the extent to which these would be lost or modified, in the context of their importance in determining the existing baseline character. The visual assessment will take into account likely changes to the visual composition, including the extent to which new features would distract or screen existing elements in the view or disrupt the scale, structure or focus of the existing view.

16.7.28 The levels of landscape and visual effects will be described with reference to the criteria outlined below in **Table 16-16**. For the purposes of this assessment, effects of moderate or above are generally considered to be significant.

Table 16-16: Significance of Effect

Significance of Effect	Landscape	Visual
Major Beneficial	Alterations that result in a considerable improvement of the existing landscape resource. Valued characteristic features would be restored or reintroduced.	Alterations that typically result in a pronounced improvement in the existing view.
Moderate Beneficial	Alterations that result in a partial improvement of the existing landscape resource. Valued characteristic features would be largely restored or reintroduced.	Alterations that typically result in a noticeable improvement in the existing view.
Minor Beneficial	Alterations that result in a slight improvement of the existing landscape resource. Characteristic features would be partially restored.	Alterations that typically result in a limited improvement in the existing view.
Negligible Beneficial	Alterations that result in a very slight improvement to the existing landscape resource, not uncharacteristic within the receiving landscape.	Alterations that typically result in a barely perceptible improvement in the existing view.
Neutral	No alteration to any of the components that contribute to the existing landscape resource.	No change to the existing view.
Negligible Adverse	Alterations that result in a very slight deterioration to the existing landscape resource, not uncharacteristic within the receiving landscape.	Alterations that typically result in a barely perceptible deterioration in the existing view.
Minor Adverse	Alterations that result in a slight deterioration of the existing landscape resource. Characteristic features would be partially lost.	Alterations that typically result in a limited deterioration in the existing view.
Moderate Adverse	Alterations that result in a partial deterioration of the existing landscape	Alterations that typically result in a noticeable

Significance of Effect	Landscape	Visual
	resource. Valued characteristic features would be largely lost.	deterioration in the existing view.
Major Adverse	Alterations that result in a considerable deterioration of the existing landscape resource. Valued characteristic features would be wholly lost.	Alterations that typically result in a pronounced deterioration in the existing view.

16.8 Green Belt Appraisal

- 16.8.1 Part of the study area is located within areas designated as green belt. Although not a landscape designation, paragraph 142 of the NPPF (Ref. 4) states that “...the fundamental aim of green belt policy is to prevent urban sprawl by keeping land permanently open: the essential characteristics are their openness and their permanence”. Openness is considered to have both spatial and visual aspects. The visual impact may therefore be relevant.
- 16.8.2 To inform the detailed green belt assessment in the planning statement, the landscape and visual chapter will include a green belt appraisal. This will consider the five purposes of green belt and potential impact on openness in relation to landscape character and visual amenity.

16.9 Assumptions, Limitations, and Uncertainties

- 16.9.1 Landscape and visual impacts are considered to result from changes to the physical and perceptual aspects of the landscape and changes to views resulting from loss of existing landscape elements including vegetation, alteration to existing topography and/or the introduction of new structures and infrastructure. Due to the early stage of the design development of the Proposed Development there is limited information on the loss of existing landscape elements, changing topography and appearance and design of new structures and infrastructure.
- 16.9.2 Limited information on the required land take, the construction working area and methodology is available; however, it has been assumed the construction area will be localised to each Part of the Proposed Development.

16.10 Approach to Mitigation

- 16.10.1 With reference to Section 6.7 in **Chapter 6: EIA Approach**, mitigation measures are undertaken as a response to anticipated adverse landscape and visual effects and can be described as embedded or additional.
- 16.10.2 Embedded mitigation measures are steps taken during the siting and design phase to help minimise potential effects, based on key sensitivities, constraints and opportunities identified through baseline study. Landscape and visual considerations will continue to inform the form, location, and routing of the various elements of the Proposed Development throughout the design process.

- 16.10.3 Additional mitigation measures are those that seek to further reduce potential effects that could not be entirely designed out and are identified and informed by the detailed assessment stage. These include landscape reinstatement, alterations to landform, vegetative screening, these measures will seek to reduce the extent or significance of negative effects in the long-term. In relation to the Proposed Development additional mitigation measures are likely to include, reinstatement of hedgerows and other vegetation along the underground pipelines and temporary access tracks, and landscape integration of the permanent above ground infrastructure through planting and landform design. Where possible, landscape mitigation measures will be developed to support the landscape strategies and guidelines identified in published landscape character assessments.
- 16.10.4 The LVIA and site surveys will be used to help develop and refine a landscape design vision and set of design principles to guide the design of the Proposed Development in line with the National Infrastructure Commission's Design Principles (Ref. 54), Landscape institute TGN 04/20: infrastructure (Ref. 55) and Canal & River Trust Towpaths for Everyone Policy (Ref. 63). This will seek to maximise the multiple benefits that the landscape design can deliver through applying a green infrastructure approach that will inform the overall mitigation strategy and Landscape and Ecological Management Plan for the Proposed Development.

16.11 References

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Chapter 17: Major Accidents and Disasters

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17. Major Accidents and Disasters

17.1 Introduction

- 17.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on Major Accidents and Disasters (hereafter referred to as 'MA&D').
- 17.1.2 The purpose of addressing MA&D within an EIA is to identify, assess, and mitigate the risks associated with MA&D risk events relevant to the Proposed Development that could cause serious harm to people, property and the environment.
- 17.1.3 The topic of MA&D was introduced into the UK Environmental Impact Assessment (EIA) regulations as a result of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (Ref. 1) (hereafter referred to as the 'EIA Regulations'), which transposed EU Directive 2014/52/ EU (Ref. 2) into English law. The EIA Regulations require the assessment of potentially significant adverse effects of a development on the environment deriving from its vulnerability to risks of relevant major accidents and/or disasters. As the MA&D assessment considers the Proposed Development as a whole, the individual elements of the Proposed Development will be considered within this context.
- 17.1.4 For the purposes of this chapter, the definitions that have been adopted are set out in **Table 17-1**.
- 17.1.5 The chapter should be read in conjunction with the below chapters of this EIA Scoping Report in terms of further description of relevant receptors and topic assessments where there is an overlap with the MA&D assessment:
- Chapter 7: Other Assessments** (Section 7.4: Flood Risk Assessment and Section 7.6: Other Consents and Licences);
 - Chapter 10: Climate;**
 - Chapter 12: Ecology – Aquatic;**
 - Chapter 13: Ecology – Terrestrial;**
 - Chapter 14: Ground Conditions;**
 - Chapter 19: Socio-economics;**
 - Chapter 20: Traffic and Transport;** and
 - Chapter 22: Water Environment and Flood Risk.**
- 17.1.6 Where relevant, the above chapters are further signposted in sections below.
- 17.1.7 This chapter is also supported by:
- The following appendix in Volume 3 of this EIA Scoping Report:
 - Appendix 17-1: Scoping of MA&D Risks.**

Table 17-1: Summary of the key terms used in the MA&D assessment

Term	Definition
Vulnerability	Vulnerability describes the susceptibility of an individual, a community, assets or systems to the impacts of hazards, either in terms of the likelihood of that experience or the extent to which an impact might result in an effect (and how reversible that effect might be). Within MA&D assessment, the term 'vulnerability' is used to describe the ability of the Proposed Development to plan, control, resist and recover from a MA&D event in a timely manner.
Hazard	A hazard is defined as an event that may cause harm. Hazards for the purposes of the MA&D assessment are defined as non-malicious events including natural disasters, industrial accidents and industrial action.
Threat	Threats for the purposes of the MA&D assessment are defined as malicious attacks.
Serious damage	Serious damage includes permanent or long-lasting damage to an environmental receptor that cannot be restored through minor clean-up and restoration efforts, and which requires the use of resources beyond those of the Proposed Development or its contractors to manage.
Major accident	A major accident, in the context of a MA&D assessment, means an uncontrolled event caused by a man-made activity or asset that may result in immediate or delayed serious damage the environment and requires the use of resources beyond those of the Proposed Development or its contractors to manage. It should be noted that malicious intent is not accidental, however the outcome of such an incident may be the same and, therefore, the same mitigation measures may apply to both deliberate and accidental events.
Disaster	A disaster, in the context of MA&D assessment, is a naturally occurring phenomenon such as an extreme weather event (e.g. storm, flood, extreme temperatures) or ground-related hazard event (e.g. subsidence, landslide, earthquake) with the potential to cause an event or situation that leads to immediate or delayed serious damage the environment and requires the use of resources beyond those of the Applicant or its contractors to manage.

17.2 Legislation, Planning Policy Context, and Guidance

17.2.1 Legislation, planning policy and guidance relating to MA&D assessment is listed below.

Legislation

17.2.2 Legislation that is relevant to the assessment of MA&D in relation to the Proposed Development includes the below:

- a. Legislation that is relevant to the methodology includes:
 - i. Civil Contingencies Act 2004 (Ref. 3);
- b. Legislation that is relevant to defining mitigation measures:
 - i. The Building Regulations 2010 (Ref. 8);
 - ii. The Construction Design and Management (CDM) Regulations 2015 (Ref. 9);
 - iii. The Control of Substances Hazardous to Health (COSHH) Regulations 2002 (Ref. 4);
 - iv. Environmental Permitting (England and Wales) Regulations 2016 (Ref. 5);
 - v. Health and Safety at Work etc. Act 1974 (Ref. 6);
 - vi. Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) (Ref. 7);
 - vii. The Management of Health and Safety at Work Regulations 1999 (Ref. 10);
 - viii. The Pipelines Safety Regulations (PSR) 1996 (Ref. 11).
 - ix. The Regulatory Reform (Fire Safety) Order 2005 (Ref. 12);
 - x. Reservoir Act 1975 (Ref. 13);
 - xi. Water Industry Act 1991 (Ref. 14);
 - xii. The Workplace (Health, Safety and Welfare) Regulations 1992 (Ref. 15);
- c. Legislation that is relevant to the control of MA&D in the surrounding area:
 - i. The Control Of Major Accident Hazards (COMAH) Regulations 2015 (Ref. 17); and
 - ii. The Planning (Hazardous Substances) Regulations 2015 (Ref. 18).

17.2.3 Whilst implementation of the legislation listed above may serve to illuminate elements of the Proposed Development relevant to MA&D, any assessment that might subsequently be undertaken in respect of MA&D or measures considered necessary to mitigate MA&D impacts or effects would neither seek to duplicate, amend nor form a substitute for such legislation. Rather, consideration of MA&D in this EIA Scoping Report and any subsequent assessment undertaken assumes all legislative obligations are met in full. Further information is provided in **Appendix 17-1** in Volume 3 of this EIA Scoping Report.

National Policies, Plans and Strategies

17.2.4 The relevant national policies, plans and strategies for MA&D are summarised below and within **Table 17-2**. These documents have informed the scope of the assessment, identification of sensitive receptors and mitigation requirements.

Table 17-2: National policies, plans and strategies – Major Accidents and Disasters

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 19)	- Chapter 3 of the NPSWRI sets out the “<i>principles against which an application for development consent should be examined and determined</i>”. Within this chapter, paragraphs 3.8.1 to 3.8.9 set out how impacts relating to discharges or emissions from a proposed project may be controlled through separate regulation under the pollution control framework or other consenting and licensing regimes. - Paragraphs 3.10.1 to 3.10.6 of the NPSWRI set out the safety requirements for all water resource infrastructure types, with paragraph 3.10.5 reiterating the requirements of the EIA Regulations to consider the implications of MA&D. - Paragraphs 3.11.1 to 3.11.16 provides further guidance on safety considerations, with paragraph 3.11.2 stating the importance of ‘proportionate protective’ security measures being designed into new infrastructure projects at an early stage. - Whilst reference is made to the need for a MA&D assessment to be undertaken, the document does not set out any requirements for the content of the assessment itself.	- MA&D assessment considers compliance with other consenting and licensing regimes as part of the mitigation for the Proposed Development. - Safety and security considerations are included within the scope of the MA&D assessment.
National Planning Policy Framework (NPPF) (Ref. 20)	Paragraph 46 states that “<i>Local planning authorities should consult the appropriate bodies when considering applications for the siting of, or changes</i>	MA&D assessment considers the locations of existing major hazard sites, installations or pipelines as part of the baseline.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	<i>to, major hazard sites, installations or pipelines, or for development around them.”</i> Paragraph 102 states that planning policies and decisions should promote public safety, anticipating and addressing malicious threats and other hazards (whether natural or man-made). Developments should be informed by the most up-to-date information available from the police and other agencies about the nature of potential threats and their implications. This includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security.	The scope of the MA&D assessment considers threats to safety and security, and other manmade and natural hazards. The assessment will be informed by the relevant Local Resilience Forum's Risk Registers, which set out risks relevant to the local area. Safety and security considerations are included within the scope of the MA&D assessment.
National Risk Register (Ref. 21)	The National Risk Register lists MA&D risks relevant to the UK and sets out how the Government and others prepare for and manage them in accordance with the Civil Contingencies Act 2004 (Ref. 3).	The National Risk Register has informed the scope and list of hazards and threats considered within the MA&D assessment.

Local Policies, Plans and Strategies

- 17.2.5 The Local Plan documents referred to in **Table 2-1** of **Chapter 2: Legislation, Policy and Guidance** of this EIA Scoping Report were reviewed, however none of the documents provide any commentary specifically on MA&D. As the MA&D assessment is informed by information that is presented in other chapters within this EIA Scoping Report, the policies that are mentioned in **Chapter 10: Climate**, **Chapter 14: Ground Conditions**, **Chapter 20: Traffic and Transport** and **Chapter 22: Water Environment and Flood Risk** are also relevant to this chapter, however, have not been repeated here.
- 17.2.6 Whilst the Local Plans do not include any specific commentary on MA&D, each Local Authority is part of a Local Resilience Forum which are multi-agency partnerships that aim to plan and prepare for localised incidents and catastrophic emergencies in accordance with the Civil Contingencies Act. They work to identify potential risks and produce emergency plans to either prevent or mitigate the impact of any incident on their local communities. The following Local Resilience Forums' Risk Registers have been used to identify MA&D hazards relevant to the local area and identify potential MA&D risks in this EIA Scoping Report:
- a. West Midlands Local Resilience Forum (Ref. 22);
 - b. Warwickshire Resilience Forum (Ref. 23);
 - c. Northamptonshire Local Resilience Forum (Ref. 24);
 - d. Thames Valley Local Resilience Forum (Ref. 25); and
 - e. Bedfordshire Local Resilience Forum (Ref. 26).

Guidance and Standards

- 17.2.7 There is no specific guidance available which sets out the approach for undertaking a MA&Ds assessment within an EIA, and therefore the assessment has been developed according to EIA best practice, ensuring consistency with the relevant guidance and standards listed below.
- 17.2.8 Guidance and standards relevant to the MA&D assessment include:
- a. European Commission's 2017 Guidance on EIA (Ref. 27);
 - b. The International Standards Organization's (ISO) ISO 31000:2018 Risk Management – Guidelines (Ref. 28);
 - c. Institute of Environmental Management and Assessment's (IEMA) guidance 'MA&D in EIA: A Primer' (the 'IEMA Primer') (Ref. 29); and
 - d. Cabinet Office's Emergency Preparedness guidance (the 'Emergency Preparedness guidance') (Ref. 30).
- 17.2.9 The assessment methodology presented in this chapter has been developed in accordance with the principles of the staged assessment identified in the IEMA Primer and utilises the risk assessment framework set out within the Emergency Preparedness guidance to identify potentially significant effects.

17.3 Consultation

- 17.3.1 Other than discussions within the project partners, non-statutory consultation and some local authority consultation on the Proposed Development, no stakeholder engagement has been undertaken with the Local Resilience Forums (LRF) to date with respect to the scope or assessment methodology set out in this chapter.
- 17.3.2 Key topics of relevance to MA&D raised during non-statutory consultation included concerns relating to flood risk and the interface between the Proposed Development and any existing major accident hazard pipelines. A Flood Risk Assessment will be undertaken as part of the EIA which will consider flood risk impacts and mitigation requirements in detail. In addition, further engagement with statutory undertakers will be undertaken for any services, including existing major accident hazard pipelines, potentially impacted by the Proposed Development. This will inform design development and the drafting of any protective provisions with the Development Consent Order (DCO).

17.4 Study Area

- 17.4.1 This section sets out the study area adopted for the whole of the Proposed Development. The study area for the assessment of MA&D is not defined within regulatory guidance or any standardised methodology. Therefore, for the purposes of this EIA Scoping Report, the MA&D study area has been identified through the use of professional judgement and the study areas used for relevant topic assessments.
- 17.4.2 A study area of 5 km from the perimeter of the EIA Scoping Boundary for all parts of the Proposed Development has nominally been applied both to establish baseline conditions and evaluate the potential for likely significant effects. This distance has been used because it is likely to capture all relevant risks, hazards and receptors relevant to a MA&D assessment. However, where hazard pathways between receptor and impact are clearly more constrained, focus has been drawn on a more appropriate area and referenced appropriately.

17.5 Baseline Conditions

Context

- 17.5.1 Baseline in the context of MA&D includes the identification of sensitive environmental receptors, which may be impacted in the event of a MA&D, as well as the identification of relevant hazards and threats based on the location of the Proposed Development.
- 17.5.2 MAGIC Maps (Ref. 33) have been used to identify sensitive receptors within the MA&D study area. To avoid duplication of data gathering, baseline information referred to within this chapter has also been sourced from other topic assessments presented within this EIA Scoping Report, including **Chapter 10: Climate, Chapter 12: Ecology – Aquatic, Chapter 13: Ecology – Terrestrial, Chapter 14: Ground Conditions, Chapter 19: Socio-economics, and Chapter 22: Water Environment and Flood Risk.**

17.5.3 In order to identify potential MA&D hazards and threats relevant to the location of the Proposed Development, the following data sources have been reviewed:

- a. European Commission's Major Accident Reporting System (Ref. 31);
- b. Cabinet Office National Risk Register of Civil Emergencies (Ref. 21);
- c. West Midlands Local Resilience Forum (Ref. 22);
- d. Warwickshire Resilience Forum (Ref. 23);
- e. Northamptonshire Local Resilience Forum (Ref. 24);
- f. Thames Valley Local Resilience Forum (Ref. 25);
- g. Bedfordshire Local Resilience Forum (Ref. 26);
- h. COMAH data search (Ref. 32);
- i. Zetica unexploded ordnance (UXO) Risk Maps (Ref. 34); and
- j. Flood Map (Ref. 35)

17.5.4 In summary, the below existing hazards and threats have been identified as potentially relevant to the Proposed Development:

- a. Flooding from rivers, surface water, groundwater, inundation from reservoirs, canals and sewers;
- b. Storms;
- c. Droughts;
- d. Heatwaves;
- e. Low temperatures and heavy snow (extreme cold weather resulting in snow and ice);
- f. Wildfires;
- g. Ground or structural collapse (e.g. canal bank collapse and construction on existing or historic landfills);
- h. Fire/ explosion (including from UXO or utility strike);
- i. Outbreak of disease including animal health- notifiable disease, emerging infectious disease and pandemic influenza.
- j. Severe meteorology (e.g. electrical storms);
- k. Earthquakes;
- l. Volcanic eruptions;
- m. General mains network outage causing the Proposed Development to lose power; and
- n. Major accidents caused by malicious acts/vandalism against the Proposed Development.

17.5.5 In addition, the construction and operation of the Proposed Development may give rise to the following additional hazards:

- a. Pipeline burst;
- b. Pollution incidents;

- c. Impairment, interruption or severance of existing utilities;
 - d. Full or partial obstruction of emergency services;
 - e. Road Traffic Accident on the wider traffic network;
 - f. Railway Incident; and
 - g. Boating incident on the canal network or the reservoirs (including as a result of impacts on navigation).
- 17.5.6 Further information on potential source-receptor pathways associated with the above hazards is set out within **Appendix 17-1** within Volume 3 of this EIA Scoping Report. A summary of the existing industrial sites which may give rise to some of these hazards and receptors which may be impacted in the event of a MA&D (e.g. existing infrastructure, human receptors and environmental receptors) is provided below.
- 17.5.7 For the topic of MA&D, the baseline has been established at a Proposed Development-wide level rather than examining individual parts of the Proposed Development. Any measurements provided have been taken based on the shortest distance (i.e. as-the-crow-flies) between the closest respective points of the Proposed Development and the feature described.

Existing Baseline

Existing Infrastructure and Industrial Sites

- 17.5.8 There are a number of airports and airfields within 20 km of the EIA Scoping Boundary for the Proposed Development, including but not limited to: Charity Farm (Baxterley) Airfield (within 200 m of Part 1b), Stoke Golding Airfield (approx. 6km east of Part 2) Birmingham Airport (approx. 6.5 km south of Part 1a), Coventry Airport (approx. 7.5 km south of Part 2), Holmebeck Farm Airfield (approx. 3.7 km west of Part 4b) and Luton Airport (approx. 4.5 km east of Part 4b). There are also railway lines that are crossed by the EIA Scoping Boundary of Part 1b and Part 2 of the Proposed Development. Part 1b of the Proposed Development also crosses an area safeguarded for the construction of HS2. Other principal transport infrastructure within the immediate vicinity or crossed by the Proposed Development includes, but is not limited to:
- a. Parts 1a and 1b: M42 and M6 (toll);
 - b. Part 2: A444, M6, A428, M69, A43, A45, A5, M1, A43 and A508;
 - c. Part 3: A45;
 - d. Part 4a: A4146; and
 - e. Part 4b: A5, A505, A4146 and the A5183.
- 17.5.9 Due to the location of the EIA Scoping Boundary, there are a number of man-made features and existing hazard sources that have been identified that lie in proximity to the Proposed Development. The man-made features and existing hazard sources include seven Lower Tier COMAH sites, six Upper Tier COMAH sites, electricity sub stations, petrol stations, the existing Minworth Wastewater Recycling Centre (WwRC), existing and historic landfill sites and a number of industrial units. A large number of other industrial facilities are located within the study area and comprise a range of activities including quarrying. Further information on reservoirs which may pose a risk

of flooding is provided within **Chapter 22: Water Environment and Flood Risk** of this EIA Scoping Report.

Residential Receptors

- 17.5.10 The Proposed Development traverses through or in close proximity to a number of densely populated areas, including but not limited to:
- a. Part 1a: Minworth AWTP – Minworth, Curdworth, Water Orton;
 - b. Part 1b: Minworth to Atherstone Pipeline – Curdworth, Lea Marston, Hurley, Baxterley, Atherstone;
 - c. Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals – Atherstone, Nuneaton, Bedworth, Coventry, Rugby, Daventry, Milton Keynes, Leighton Buzzard;
 - d. Part 3: Daventry and Drayton Reservoirs - Daventry;
 - e. Part 4a: Abstraction, storage and treatment - Bletchley, Woburn, Leighton Buzzard, Houghton Regis, Dunstable and Luton; and
 - f. Part 4b: Pipeline to an underground reservoir near Luton – Bletchley, Woburn, Leighton Buzzard, Houghton Regis, Dunstable and Luton.
- 17.5.11 It is also noted that there are residential moorings and marinas on the canals which also form residential receptors.
- 17.5.12 Further details of the demographic of these areas are set out in **Chapter 19: Socio-economics**.

Natural Features and Protected Environmental Sites

- 17.5.13 Information on natural features and protected areas in the surrounding environment of the Proposed Development are provided in detail within the relevant chapters of this EIA Scoping Report. This section provides a brief outline of the natural features and protected environmental sites. Further details of these resources and receptors will be provided in the assessment within the ES.
- 17.5.14 The statutory ecological designations within 5 km of the EIA Scoping Boundary for the Proposed Development comprise:
- a. Part 1 – 10 Sites of Special Scientific Interest (SSSI);
 - b. Parts 2 and 3 – 1 Special Area of Conservation (SAC), 39 SSSIs and 1 National Nature Reserve (NNR); and
 - c. Part 4 – 1 SAC, 23 SSSIs, and 1 NNR.
- 17.5.15 In addition, there are numerous non-statutory designated ecological sites (e.g. areas of ancient woodland, County and Local Wildlife Sites (CWS, LWS), Sites of Importance for Nature Conservation (SINCs)) within the study area. Daventry Reservoir within Part 3 of the Proposed Development is a designated Local Nature Reserve (LNR) and LWS and Daventry Reservoir is a potential LWS. Further details of ecological receptors are set out in **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial** of this EIA Scoping Report.

- 17.5.16 The Proposed Development is hydrologically linked to the Rivers Tame and Trent and Part 1b of the Proposed Development also crosses the River Tame and Dog Lane Brook main rivers. In addition, the River Ouzel crosses Site B within Part 4a of the Proposed Development.
- 17.5.17 As described in **Chapter 22: Water Environment and Flood Risk**, the EIA Scoping Boundary for all parts of the Proposed Development include areas which are characterised as Flood Zone 2 (between a 1% and 0.1% chance of flooding from rivers) and Flood Zone 3 (1% or more chance of flooding from rivers). Areas of low (between 0.1% and 1% chance of surface water flooding each year), medium (between 1% and 3.3% chance of flooding each year) and high (more than a 3.3% chance of surface water flooding each year) risk of surface water flooding are also recorded within the EIA Scoping Boundary. Further details of flood risk, including those related to the Environment Agency's risk of flooding from reservoirs mapping, are provided in **Chapter 22: Water Environment and Flood Risk**.
- 17.5.18 Zetica online UXO risks map (Ref. 34) identifies that the EIA Scoping Boundary of Parts 1a, 1b, 3 and 4a are primarily located within areas of low risk of UXO. Part 2 crosses areas of low risk (majority of the route), moderate risk (around Nuneaton and Bedworth) and high risk (around Coventry) of UXO. The majority of Part 4b is within an area of low risk, however a small section to the north of Caddington is located within an area of moderate risk of UXO. UXO risk will be considered in the Phase 1 desk-based assessment as identified in **Chapter 14: Ground Conditions**.

Future Baseline

- 17.5.19 It is possible that additional man-made features and hazard sources could be constructed in the study area in the future. The list of cumulative schemes will be reviewed as part of the EIA process for PEIR and ES stages, to identify any potential new major accident sources within the study area of the Proposed Development.
- 17.5.20 In addition, the future baseline for the MA&D assessment will consider natural population growth and how predicted climate change might affect existing conditions at the Proposed Development. The future baseline in respect to climate is discussed in further detail in **Chapter 10: Climate** of this EIA Scoping Report.

17.6 Potential Effects

- 17.6.1 The IEMA Primer (Ref. 29) states that the MA&D hazard or threat can be scoped out of the EIA, if the assessment can demonstrate:
- “...there is no source-pathway-receptor linkage of a hazard that could trigger a major accident and/or disaster or potential for the scheme to lead to a significant environmental effect; or*
 - all possible major accidents and/or disasters are adequately covered elsewhere in the assessment or covered by existing design measures or compliance with legislation and best practice.”*
- 17.6.2 However, if the above cannot be demonstrated then the topic ought to be scoped in.

- 17.6.3 In order to determine whether the above requirements are met, a review of MA&D baseline risks has been undertaken and is included in **Appendix 17-1** within Volume 3 of the EIA Scoping Report. The review of MA&D baseline risks was undertaken in line with guidance set out in the IEMA Primer and considers the current risk profile identified within the Community Risk Registers and consideration of specific risks relating to the construction and operation of the Proposed Development. Details are provided on the potential source-pathway-receptor linkage as well as details on the reasonable 'worst-case' consequence if the risk event did occur. It is then considered, whether with mitigation in place, the risk could lead to a major accident and/or disaster.
- 17.6.4 As noted above, where legislation and processes exist outside of the EIA to ensure safe design and operation, this is signposted within **Appendix 17-1**.
- 17.6.5 Following the review of the MA&D baseline risks and the risks that could be introduced by the Proposed Development (**Appendix 17-1**), it is concluded that the following potential risk events could occur during the construction and operational phases of Parts 2 and 3 of the Proposed Development which are not already addressed by other EIA topics or covered by compliance with existing legislation and processes:
- a. Boating incidents on the canal network or reservoirs (including as a result of impacts on navigation).
- 17.6.6 All other potential risk events identified in **Appendix 17-1** are considered to be acceptable or reduced to 'As Low as Reasonably Practicable' (ALARP) with the implementation of mitigation and/or are already assessed as part of other EIA topic chapters and, therefore, can be scoped out of the MA&D assessment.
- 17.6.7 An updated version of **Appendix 17-1** will be provided within the ES to signpost the relevant other topic chapters and supporting assessment which consider risk events scoped out of the MA&D assessment.

17.7 Approach to Assessment

Establishing Baseline Conditions

- 17.7.1 The baseline conditions set out in Section 17.5 will be reviewed and updated at the assessment stage within the ES. Whilst there are no MA&D specific surveys, the assessment will utilise the baseline presented within other technical EIA topic chapters.

Assessment Methodology

- 17.7.2 The assessment methodology will follow the below staged process.
- a. Stage 1: Identification of risk events:
 - i. All scoped in MA&D risk events will be collated into an Environmental Risk Assessment;
 - b. Stage 2: Screening of risk events:

- i. Each risk event will be reviewed to determine whether a 'source-pathway-receptor' linkage exists to any of the identified environmental receptors;
 - ii. For each risk event with a linkage pathway, the reasonably foreseeable 'worst-case' environmental consequence (i.e. the likely significant effect) will be identified;
 - iii. The reasonably foreseeable 'worst-case' consequence of risk events and associated magnitude of potential impacts will be identified and categorised based on the 'severity of harm' and 'duration' as set out in the Environmental Risk Assessment;
- c. Stage 3: Identification of mitigation:
 - i. Mitigation measures that are either embedded within design, required for compliance with legislation, other regulatory regimes, or represent standard practice, and eliminate or reduce the risk of risk event occurring will be identified;
 - ii. Following the consideration of whether any further mitigation is required, the likelihood of the risk event occurring will be determined on the basis of the probability criteria;
- d. Stage 4: Identification of residual risks and their significance:
 - i. Following the consideration of all mitigation proposed, a residual risk category will be assigned, and the significance of the residual risks determined.

17.7.3 In summary, the approach will consider the reasonably foreseeable 'worst-case' environmental consequences of the identified risk events (i.e. the likely significant effect), the probability of these consequences occurring, embedded and specific mitigation to be implemented and the acceptability of the subsequent risk to the environment. The assessment process is iterative with the aim to identify sufficient controls to mitigate all MA&D risks to a level such that no significant MA&D effects are predicted.

Assessment Criteria

- 17.7.4 The MA&D assessment criteria is based upon the risk assessment process, which considers the consequences and likelihood of a risk event occurring. Reference has been made to the guidance provided as part of the Civil Contingencies Act to develop a proposed project-specific assessment criteria. The assessment has followed the principles as set out in the IEMA Primer on the assessment of MA&D in EIA.
- 17.7.5 The degree of harm and consequence are determined on the basis of a reasonably foreseeable 'worst-case' scenario of the event in the absence of mitigation. The probability of the hazard/threat occurring is determined whilst considering proposed mitigation measures. This is because mitigation would reduce the likelihood of the maximum severity of harm, duration, consequence and frequency of a hazard/threat occurring.
- 17.7.6 In line with the assessment criteria set out in the Cabinet Office's Emergency Preparedness guidance (Ref. 30), relevant receptor groups relevant to the MA&D assessment are categorised as:

- a. Health;
- b. Social;
- c. Economic; and
- d. Environment.

Degree of Harm

- 17.7.7 The criteria used in the MA&D assessment for determining the degree of harm of a hazard or threat are set out in **Table 17-3**. Any risk events where a negligible degree of harm is identified for the reasonably foreseeable 'worst-case' consequence are scoped out of the MA&D assessment.

Table 17-3: Degree of harm scoring categories

Level	Descriptor	Categories of impact	Description of harm
0	Negligible	Social	Insignificant number of persons displaced and personal support required. Insignificant disruption to community services, including transport services and infrastructure.
		Economic	Insignificant impact on local economy.
		Environment	Insignificant impact on environment.
1	Minor	Social	Minor damage to properties. Minor displacement of a small number of people <24 hours and minor personal support required. Minor localised disruption to community services or infrastructure.
		Economic	Negligible impact on local economy and cost easily absorbed.
		Environment	Minor impact on the environment with no lasting effects.
2	Moderate	Social	Damage that is confined to a specific location, or to a number of locations, but requires additional resources. Localised displacement of >100 people for 1-3 days. Localised disruption to infrastructure and community services.
		Economic	Limited impact on local economy with some short-term loss of production, with possible additional clean-up costs.
		Environment	Limited impact on environment with short-term or long-term effects.
3	Severe	Social	Significant damage that requires support for local responders with external resources. 100 to 500 people in danger and displaced for >1 week. Local responders require external resources to deliver personal support. Significant impact on, and possible breakdown of, delivery of some local community services.
		Economic	Significant impact on local economy with medium-term loss of production. Significant extra clean-up and recovery costs.

Level	Descriptor	Categories of impact	Description of harm
		Environment	Significant impact on environment with medium-to long-term effects.
4	Catastrophic	Social	Extensive damage to properties and built-up environment in affected area requiring major demolition. General and widespread displacement of >500 people for prolonged duration and extensive personal support required. Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.
		Economic	Serious impact on local and regional economy with some long-term, potentially permanent, loss of production with some structural change. Extensive clean-up and recovery costs.
		Environment	Serious long-term impact on environment and/or permanent damage.

Probability

- 17.7.8 The probability of a risk event occurring will be assessed in accordance with the definitions presented in **Table 17-4**, which are derived from the Civil Contingencies Act.

Table 17-4: Probability Criteria

Likelihood Category	Description of frequency	Ranking
5	Probable: > 1 in 2 chance over 5 years	Very high
4	Possible: Greater than > 1 in 20 chance over 5 years	High
3	Unlikely: > 1 in 200 chance over 5 years	Medium
2	Rare: > 1 in 2,000 chance over 5 years	Low
1	Negligible: > 1 in 20,000 chance over 5 years	Very low

Classification of risk

- 17.7.9 Tolerability of a risk is identified by considering the degree of harm of a risk event and probability of the 'worst-case' environmental consequence occurring. The criteria used to classify the risk of each risk event is presented in **Table 17-5** and is supported by
- 17.7.10 **Table 17-6.** Risks up to a medium level can be classed as tolerable (not significant), as long as these have been mitigated to the 'level to which we expect to see risks controlled'¹ (ALARP)). Any critical or high risks would be considered as intolerable (significant).

Table 17-5: Risk Evaluation Criteria Matrix

Probability Category	5	0	5	10	15	20
	4	0	4	8	12	16
	3	0	3	6	9	12
	2	0	2	4	6	8
	1	0	1	2	3	4
		0	1	2	3	4
	Degree of Harm Category					

Table 17-6: Level of Risk

Score (Degree of Harm x Probability)	Level of Risk Description
12-20	Critical
6-11	High
3-5	Medium
1-2	Low
0	None perceived

¹ Definition of ALARP from IEMA Primer (Ref. 29)

17.8 Assumptions, Limitations and Uncertainties

17.8.1 The following limitations are relevant to this assessment:

- a. No modelling or detailed calculations will be undertaken but a qualitative assessment approach will be adopted;
- b. Where information is not available (such as historical evidence on the likelihood and the environmental consequence of an event), professional judgement will be used to reach a conclusion;
- c. Each risk event will be considered on an individual basis. Where a risk event has the potential to result in chain reaction, this will be clearly identified within the ES to identify where an assessment of the additional risk event that could occur can be found; and
- d. No surveys beyond those undertaken to inform other EIA topics will be completed to establish the baseline for the MA&D assessment.

17.9 Approach to Mitigation

17.9.1 The IEMA Primer notes that the MA&D assessment should identify the embedded mitigation and response strategies required to demonstrate management of risks to be ALARP. The approach to demonstrate this is set out below and draws on:

- a. Measures that are in place to control baseline risks (i.e. existing control measures);
- b. Measures secured through compliance with legislation;
- c. Measures that have been identified through the design of the Proposed Development; and
- d. Measures to control risks during the construction of the Proposed Development.

Existing Control Measures

17.9.2 Under the Civil Contingencies Act 2004 (Ref. 3), all local authorities are required to ensure that hazards and threats which could result in serious damage are identified, and controlled or mitigated, as far as reasonably practicable. For those hazards and threats identified to result in high or very high risk within the Risk Registers prepared for the communities within which the Proposed Development is located, the Local Resilience Forums have developed plans to detail the response should an emergency arise. These plans form part of the mitigation in place to respond to MA&D which may arise in the baseline environment.

Legislation and Project Specific Mitigation

17.9.3 Construction activities across the Proposed Development would be managed in compliance with existing health and safety and environmental legislation and best practice, including (but not limited to) construction environmental management measures set out within a Code of Construction Practice (CoCP), construction traffic management, measures set out within a Construction Traffic Management Plan (CTMP) and the existing safety,

security and emergency arrangements with Affinity Water (AfW), Severn Trent (ST) and Canal & River Trust (the 'Trust'). With these measures in place, the majority of the MA&D risks relevant to the construction of the Proposed Development would be mitigated to ALARP and, therefore, would not be significant.

17.9.4 The design and operation of the Proposed Development would be governed by regulatory and legal requirements such as the Reservoirs Act 1975 (Ref. 16). AfW, ST and the Trust operational management arrangements would also comply with relevant health and safety and environmental legislation for the prevention and mitigation of MA&D risks, including (but not limited to) The Management of Health and Safety at Work Regulations 1999 (Ref. 10) and The Personal Protective Equipment at Work Regulations 1992 (Ref. 36). With these management arrangements in place, the majority of identified MA&D risks relevant to the operation of the Proposed Development would be mitigated to ALARP and, therefore, would not be significant.

17.9.5 Further details of the relevant hazards and mitigation measures are provided in **Appendix 17-1** within Volume 3 of the EIA Scoping Report.

17.10 References

- Ref. 1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 20/03/2025].
- Ref. 2 Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.
- Ref. 3 Civil Contingencies Act 2004. Available at: <https://www.legislation.gov.uk/ukpga/2004/36/contents> [Accessed 20/03/2025].
- Ref. 4 The Control of Substances Hazardous to Health Regulations 2002 (COSHH). Available at: <https://www.legislation.gov.uk/ukxi/2002/2677/regulation/7> [Accessed 20/03/2025].
- Ref. 5 The Environmental Permitting Regulations 2016 (as amended) The Regulatory Reform (Fire Safety) Order 2005. Available at: <https://www.legislation.gov.uk/ukxi/2005/1541/contents> [Accessed 20/03/2025].
- Ref. 6 Health and Safety at Work etc. Act 1974. Available at: <https://www.legislation.gov.uk/ukpga/1974/37/contents> [Accessed 20/03/2025].
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- Ref. 9 The Construction (Design and Management) (CDM) Regulations 2015. Available at: <https://www.legislation.gov.uk/uksi/2015/51/contents> [Accessed 20/03/2025].
- Ref. 10 The Management of Health and Safety at Work Regulations 1999. Available at: <https://www.legislation.gov.uk/uksi/1999/3242/contents> [Accessed 20/03/2025].
- Ref. 11 The Pipelines Safety Regulations 1996 (SI 1996/825). Available at: <https://www.legislation.gov.uk/uksi/1996/825/contents/made> [Accessed 20/03/2025].
- Ref. 12 The Regulatory Reform (Fire Safety) Order 2005. Available at: <https://www.legislation.gov.uk/uksi/2005/1541/contents> [Accessed 20/03/2025].
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- Ref. 14 Water Industry Act 1991. Available at: <https://www.legislation.gov.uk/ukpga/1991/56/contents> [Accessed 20/03/2025].
- Ref. 15 The Workplace (Health, Safety and Welfare) Regulations 1992. Available at: <https://www.legislation.gov.uk/id/uksi/1992/3004> [Accessed 20/03/2025].
- Ref. 16 Reservoir Act 1975. Available at: <https://www.legislation.gov.uk/ukpga/1975/23> [Accessed 20/03/2025].
- Ref. 17 The Control of Major Accident Hazards Regulations 2015. Available at: <https://www.legislation.gov.uk/uksi/2015/483/contents> [Accessed 20/03/2025].
- Ref. 18 The Planning (Hazardous Substances) Regulations 2015 [online]. Available at: <https://www.legislation.gov.uk/uksi/2015/627/contents> [Accessed 20/03/2025].
- Ref. 19 Department for Environment Food and Rural Affairs (Defra) (2023) National Policy Statement for Water Resource Infrastructure. Available at: https://assets.publishing.service.gov.uk/media/6437e3a2f4d420000cd4a1a7/E02879931_National_Policy_Statement_for_Water_Resources.pdf [Accessed 20/03/2025].
- Ref. 20 Ministry of Housing, Communities & Local Government (2018 to 2021) and Department for Levelling Up, Housing and Communities (2025) National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2#full-publication-update-history> [Accessed 21/03/2025].
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- Ref. 28 The International Standard Organization (2018) The International Standards Organizations ISO 31000:2018 Risk Management.
- Ref. 29 Institute of Environmental Management and Assessment (2020) Major Accidents and Disasters in EIA: An IEMA Primer – October 2020.
- Ref. 30 Cabinet Office (2006), Emergency Preparedness, <https://www.gov.uk/government/publications/emergency-preparedness> [Accessed 21/03/2025].
- Ref. 31 European Commission (no date) Major Accident Reporting System (eMARS) Available at: EUROPA - eMARS Dashboard - European Commission.
- Ref. 32 Health and Safety Executive (2015) COMAH 2015 Public Information (online). Available at: <https://notifications.hse.gov.uk/COMAH2015/Search.aspx> [Accessed 21/03/2025].
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Chapter 18: Noise and Vibration

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18. Noise and Vibration

18.1 Introduction

- 18.1.1 This chapter presents the scope and methodology for the assessment of the potential significant noise and vibration effects arising from the construction and operation of the Proposed Development.
- 18.1.2 The construction and operation of the Proposed Development has the potential to give rise to noise and vibration emissions which may adversely impact noise and vibration sensitive receptors (NVSR) in its vicinity. The following matters are considered in this chapter:
- a. Noise and vibration impacts arising during the construction phase, including:
 - i. Potential noise impacts arising from construction activities;
 - ii. Potential vibration impacts arising from construction activities;
 - iii. Potential noise impacts arising from changes in traffic flows on existing roads due to construction traffic;
 - b. Noise and vibration impacts arising during the operational phase, including:
 - i. Potential noise impacts arising from operational activities;
 - ii. Potential vibration impacts arising from operational activities; and
 - iii. Potential noise impacts arising from changes in traffic flows on existing roads due to operational traffic.
- 18.1.3 Potential noise and/or vibration impacts on ecological receptors are addressed in **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial** of this EIA Scoping Report.

18.2 Legislation, Planning Policy Context, and Guidance

Legislation

- 18.2.1 The applicable legislation includes The Control of Pollution Act 1974 (Ref. 1) which requires that Best Practicable Means (BPM) are adopted to control construction noise on any given site.
- 18.2.2 Sections 60 and 61 provide the main legislation regarding enabling works and construction site noise and vibration. If noise complaints are received, a Section 60 notice may be issued by the local planning authority.
- 18.2.3 This legislation supports the method of assessment presented in this chapter as it introduces BPM as a potential limit to the extent to which noise emissions during the construction phase can be controlled.

National Policies, Plans and Strategies

- 18.2.4 The relevant national policies, plans and strategies for noise and vibration are summarised within **Table 18-1** below. These documents have informed

the assessment methodology and study area within Sections 18.4 and 18.7 below.

Table 18-1: National policies, plans and strategies – Noise and Vibration

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 2)	Paragraphs 4.11.1 to 4.11.16 set out the requirements for an Applicant's noise and vibration assessment and mitigation.	These paragraphs set out the information requirements to be included in an environmental assessment of water resource infrastructure. They go on to define the mitigation options to be implemented if adverse impact is expected and factors to consider when decisions regarding consent are made.
National Planning Policy Framework (NPPF) (Ref. 3)	Section 15. Conserving and enhancing the natural environment: • Paragraph 180 – <i>“Planning policies and decisions should contribute to and enhance the natural and local environment by: e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.”</i> • Paragraph 191 – <i>“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:</i> a) <i>mitigate and reduce to a minimum potential adverse impact, resulting from noise from new development –</i>	The referenced paragraphs highlight the need to consider adverse impacts arising from noise when assessing developments with the potential to generate noise.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	<i>and avoid noise giving rise to significant adverse impacts on health and the quality of life.”</i>	
Noise Policy Statement for England (NSPE) (Ref. 4)	The statement sets out the long-term vision of the Government’s noise policy, which is to <i>“promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development”</i>. This long-term vision is supported by three aims: • <i>“Avoid significant adverse impacts on health and quality of life;</i> • <i>Mitigate and minimise adverse impacts on health and quality of life; and</i> • <i>Where possible, contribute to the improvements of health and quality of life.”</i> The long-term policy vision and aims are designed to enable decisions to be made regarding what is an acceptable noise burden to place on society. The ‘Explanatory Note’ within the NPSE provides further guidance on defining ‘significant adverse effects’ and ‘adverse effects’ using the concepts: • No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level there is no detectable effect on health and quality of life due to sound can be established;	The NPSE provides a clear definition of Government policy as it relates to noise and a defined framework within which noise impacts can be categorised and assessed. The terminology used in this document has been carried through to the approach to assessment as defined in Section 18.7.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	• Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and • Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur. The three aims can therefore be interpreted as follows: • The first aim is to avoid noise levels above the SOAEL; • The second aim considers situations where noise levels are between the LOAEL and SOAEL. In such circumstances, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur; and • The third aim considers situations where improvements to health and quality of life can be delivered as part of a development. The NPSE recognises that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that is applicable to all sources of noise in all situations. The levels are likely to be different for different sound sources, receptors and at different times of the day.	

Local Policy

- 18.2.5 The local policies listed in **Table 18-2** are considered relevant to the scope and method of assessment of potential noise and vibration impacts presented in this chapter.

Table 18-2: List of relevant local policy – noise and vibration

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • TP37 Health	Ref. 5	The policy seeks to reduce noise within the city.
	New Local Plan for Birmingham 2042	Ref. 6	No new policies for noise identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
	Development Management in Birmingham Development Plan Document: • DM6	Ref. 7	The policy sets out requirements to manage and reduce noise levels including assessment for development proposal criteria.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • LP29 Development Considerations.	Ref. 8	The policy sets out requirements for development considerations on communities and future generations regarding noise exposure.
Warwickshire County Council	Noise and vibration matters are not addressed at a county level, other than from transport, minerals or waste related development. As such, there is no policy relevant to the Proposed Development.	N/A	None.
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: • BE3 Sustainable design and construction.	Ref. 9	The policy states significant impacts associated with proposed development should be minimised.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Borough Plan Review 2021-2039	Ref. 10	No new policies for noise identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Coventry City Council	Coventry Local Plan (2011-2031): • CC10 Environmental Management.	Ref. 11	The policy sets out the requirements as they relate to noise from and/or affecting new developments with reference made to BS 4142 and BS 8223.
	Local Plan Review: Issues and Options Consultation (2023)	Ref. 12	Refers to the requirement for new development to minimise noise pollution.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: • HS5 Traffic Generation and Air Quality, Noise and Vibration.	Ref. 13	This policy sets out a requirement to address adverse noise and vibration impacts from and/or affecting proposed development.
	Rugby Borough Local Plan review – issues and options consultation (2023)	Ref. 14	No new policies for noise identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1 (2014) • BN9 Planning for Pollution Control	Ref. 15	The policy sets out a requirement to reduce the adverse impact of noise to and/or from proposed development.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District	Ref. 16	No new policies for noise identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
	New Local Plan for West Northamptonshire 2041: • PL7 – Design and Amenity	Ref. 17	The policy states its support for schemes that result in good standard of amenity for future occupiers.

Local authority	Relevant local policy	Reference	Relevance to the assessment
Milton Keynes City Council	Plan: MK 2016 – 2031: • NE6 Environmental Pollution	Ref. 18	The policy sets out requirements for assessment of proposed developments. This includes whether a proposal will result in high levels of disruption to human health, the natural environment or tranquillity of the countryside.
	New City Plan: Ambition and Objectives Consultation 2023	Ref. 19	No new policies for noise identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: • NE5 Pollution, air quality and contaminated land.	Ref. 20	The policy sets out requirements for baseline assessment and methodology including implementing noise attenuation measures, submitting a noise impact survey and implementing noise limits, all where applies.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives	Ref. 21	No new policies for noise identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: • CC8 Pollution and Land Instability	Ref. 22	The policy states significant impacts for development should follow guidance to limit the impact of pollution.

Guidance and Standards

18.2.6 Relevant guidance and standards which have been used as part of the scoping process are listed below:

- a. Planning Practice Guidance (PPG) – Noise (Ref. 23);
- b. British Standard (BS) 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures (Ref. 24);
- c. BS 7445-2:1991 Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use (Ref. 25);
- d. BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise (Ref. 26);
- e. BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control of Construction and Open Sites – Part 2: Vibration (Ref. 27);
- f. BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings (Ref. 28);
- g. BS 7385-2:1993 Evaluation and measurement for vibration in buildings – Guide to damage levels from ground borne vibration (Ref. 29);
- h. BS 4142:2014+A1:2019 Method for Rating and Assessing Industrial and Commercial Sound (Ref. 30);
- i. BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings (Ref. 31);
- j. Calculation of Road Traffic Noise (CRTN) (Ref. 32);
- k. Design Manual for Roads and Bridges (DMRB) LA111 Noise and Vibration (Ref. 33);
- l. World Health Organization (WHO) (1999) Guidelines for Community Noise (Ref. 34);
- m. WHO (2009) Night Noise Guidelines for Europe (Ref. 35);
- n. WHO (2018) Environmental Noise Guidelines for the European Region (Ref. 36); and
- o. ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors (Ref. 37).

18.3 Consultation

18.3.1 A summary of key topics raised during non-statutory consultation with regards to noise and vibration is provided below:

- a. Impact on local residents (including boaters) during construction in relation to noise and vibration; and
- b. Consideration of transporting construction materials by canal boats rather than vehicles.

18.3.2 These topics will be addressed accordingly in the next stage of EIA at PEIR and ES.

- 18.3.3 As part of the EIA process, consultation will be undertaken with the relevant local planning authorities and Environmental Health Officers (EHO) to inform the assessment and mitigation including specific technical details and monitoring locations for the Proposed Development.

18.4 Study Area

- 18.4.1 For the construction phase, the study area is defined as 300 metres (m) from the EIA Scoping Boundary for noise, and 100 m for vibration.
- 18.4.2 The study areas for operational phase impacts will be confirmed through the Scoping Opinion, but may require updating following design evolution and further consultation with local planning authorities and/or feedback on PEIR and will be based on the:
- a. Expected level of noise emission from the various proposed permanent installations (e.g. Minworth AWTP [Part 1a] and the abstraction, storage and treatment plant [Part 4a]);
 - b. Location of nearby NVSRs; and
 - c. Existing acoustic environment.
- 18.4.3 Potential noise and vibration impacts on ecological receptors are addressed in **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial** of this EIA Scoping Report. However, ecological receptors will be included in the noise and vibration assessment to inform these chapters, where required.
- 18.4.4 Road traffic noise effects will be assessed in accordance with guidance presented in DMRB (Ref. 33) and will cover all affected links identified in the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**). In accordance with this guidance, impacts will be considered where noise emissions from a given road link are expected to increase by more than 1 decibel (dB).

Part 1a: Minworth AWTP

Construction Phase

- 18.4.5 The construction of the proposed Minworth AWTP and use of associated plant/machinery and construction vehicles has the potential to give rise to temporary construction phase noise and vibration effects. The main components of Part 1a that would generate noise and vibration during the construction phase include:
- a. Influent Pumping Station;
 - b. Flocculation and Sedimentation (Floc-Sed) Units;
 - c. Filter Building;
 - d. New wetland areas, if selected as a treatment option;
 - e. Electrical buildings and kiosks for new power supply;
 - f. Other associated above and below ground works, including pipework and landscaping;
 - g. Access roads and car parking; and

- h. Temporary construction working areas and compounds.
- 18.4.6 A temporary increase in road traffic noise is possible due to traffic movements associated with the construction of Part 1a. Therefore, changes in road traffic noise on all affected links, as identified as part of the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**), will be considered.

Operational Phase

- 18.4.7 The following parts of the Part 1a will potentially include mechanical plant and processes with the potential to give rise to operational phase noise effects:
- a. Influent Pumping Station;
 - b. Flocculation and Sedimentation (Floc-Sed) Units;
 - c. Filter Building;
 - d. Electrical buildings and kiosks for new power supply; and
 - e. Access roads and car parking.
- 18.4.8 Seven residential dwellings on Coleshill Road to the north of the Minworth AWTP have been identified as the closest NVSRs at a distance of approximately 50 m. There are also non-residential receptors on Marsh Lane (B4118) to the south at a distance of approximately 330 m and further residential NVSRs on Old Church Road in Water Orton to the south-west at a distance of approximately 430 m.
- 18.4.9 As a minimum, these receptors will be included in the noise study area for this aspect of the Proposed Development.
- 18.4.10 Once operational, the Minworth AWTP will not contain operational phase plant which generates significant levels of vibration.
- 18.4.11 Furthermore, in the unlikely event that, at a later stage it becomes apparent that plant is required that does have the potential to generate significant levels of vibration, mitigation measures can be readily included in the design of these systems (e.g. anti vibration mounts, inertia bases) which will mitigate these emissions.
- 18.4.12 Therefore, vibration impacts during the operational phase are scoped out.

Part 1b: Minworth to Atherstone Pipeline

Construction Phase

- 18.4.13 The Minworth to Atherstone pipeline (Part 1b of the Proposed Development) includes the construction of the following infrastructure:
- a. Pipeline to transfer water;
 - b. A Break Pressure Tank (BPT) in a building;
 - c. Works to facilitate access;
 - d. Temporary construction working areas and compounds; and
 - e. Other associated above and below ground works relating to the pipeline.

- 18.4.14 The construction of these elements has the potential to give rise to construction phase noise and vibration effects.
- 18.4.15 The route has been carefully selected to avoid, where possible, passing in close proximity to NVSRs. However, there are several points where the route will pass within 300 m of NVSRs, e.g. receptors in Lea Marston, Hurley, Baxterley and the outskirts of Atherstone.
- 18.4.16 Most of the pipeline will be installed using open cut methods. Where obstructions, such as major roads, rivers and railways prevent the use of open cut methods, the construction method will utilise trenchless techniques to install the new pipeline. The construction activities will be of relatively short duration in any given location; approximately 20 m of pipeline is expected to be laid per day.
- 18.4.17 Therefore, although included within the scope of the assessment, it is likely that adverse impact associated with construction noise and/or vibration will be avoided due to works only ever being in close proximity to a given receptor for a short duration.
- 18.4.18 The construction of the BPT is expected to take longer, approximately nine months, and is in proximity to a number of NVSRs including a care home on Twenty One Oaks (Bentley House Care Centre). Further consideration will be given to construction noise and vibration emissions from this element.
- 18.4.19 An increase in road traffic noise is possible due to traffic movements associated with the construction of Part 1b. Therefore, changes in road traffic noise on all affected links, as identified as part of the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**), will be considered.

Operational Phase

- 18.4.20 Once the pipeline is laid and operational, no appreciable noise emissions will occur from this element. Therefore, the only element with the potential to give rise to impacts during the operational phase is the BPT.
- 18.4.21 Various NVSRs have been identified around the BPT. These include Merevale Cottage (20 m east) and Bentley House Care Centre (110 m west).
- 18.4.22 As a minimum, these receptors will be included in the noise study area for Part 1b of the Proposed Development.
- 18.4.23 The BPT does not contain operational phase plant which will generate significant levels of vibration.
- 18.4.24 Furthermore, in the unlikely event that, at a later stage it becomes apparent that plant is required that does have the potential to generate significant levels of vibration, mitigation measures can be readily included in the design of these systems (e.g. anti vibration mounts, inertia bases) which will mitigate these emissions.
- 18.4.25 Therefore, vibration impacts during the operational phase are scoped out.

Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals

Construction Phase

18.4.26 Part 2 of the Proposed Development comprises:

- a. An outfall structure at Atherstone to control the discharge of the recycled water transferred from the Minworth AWTP;
- b. Construction of pumped and gravity bypasses to bypass locks, as not all locks and bypass weirs will be able to pass maximum transfer flows while maintaining safe navigation;
- c. Potential modification to some existing canal bridges to ensure safe navigation/headroom clearance, where water levels are predicted to increase during peak transfer;
- d. Raising of sections of canal bank levels to maintain a minimum freeboard (vertical distance from the top of the canal bank to the water surface) – required to prevent potential overtopping, maintain safe moorings and prevent water loss;
- e. An alternative to extended stretches of bank raising may include the construction of a number of stop locks. A stop lock breaks the flow of water and is a way to control the flow and prevent one section of canal taking large amounts of water from another section of canal;
- f. Modification of a number of existing control and waste weirs to prevent water loss and premature discharge to adjacent connected watercourses;
- g. Works to facilitate temporary and permanent access;
- h. Temporary construction working areas and compounds; and
- i. Other associated above and below ground works relating to the canal network (e.g. works to towpaths and to improve local towpath access points, facilities for boaters, such as mooring sites, rings etc, potential works to existing vacant/ surplus canal side buildings / re-use, installation of signage, site reinstatement and habitat establishment, landscaping).

18.4.27 The construction of these elements has the potential to give rise to construction phase noise and vibration effects at a number of locations along the canals. The assessment will have regard to the potential effects of vibration on the 200+ year old canal and reservoir infrastructure.

18.4.28 In addition to NVSRs adjacent to the canal network, the assessment will also consider potential impacts on permanent (leisure, residential and trade) moorings of canal boats (to be identified at the PEIR and ES stage).

18.4.29 An increase in road traffic noise is possible due to traffic movements associated with the construction of Part 2. Therefore, changes in road traffic noise on all affected links, as identified as part of the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**), will be considered.

Operational Phase

18.4.30 The following elements of Part 2 of the Proposed Development include mechanical elements and therefore have the potential to give rise to operational phase noise effects:

- a. The outfall structure at Atherstone; and
- b. The bypass pumping stations.

18.4.31 The operational phase study area will include an area around each noise generating element extending out to include, as a minimum, the closest NVSRs, including any permanent moorings (to be identified at the PEIR and ES stage when the Order Limits are further refined).

18.4.32 In addition to permanent receptor locations along the canals (e.g. dwellings and some moorings), there are also leisure and recreational users of canals and towpaths. Therefore, consideration will be given to potential noise effects on people using the canal for leisure and recreational uses.

18.4.33 The above assets do not contain operational phase plant which will generate significant levels of vibration.

18.4.34 Furthermore, in the unlikely event that, at a later stage it becomes apparent that plant is required that does have the potential to generate significant levels of vibration, mitigation measures can be readily included in the design of these systems (e.g. anti vibration mounts, inertia bases) which will mitigate these emissions.

18.4.35 Therefore, vibration impacts during the operational phase are scoped out.

Part 3: Daventry and Drayton Reservoirs

Construction Phase

18.4.36 Part 3 of the Proposed Development comprises:

- a. A new inlet weir, transfer pipe and inlet system to allow water to be transferred between the canal and Drayton Reservoir. In addition, modifications will be made to the existing outlet from the reservoir to accommodate flows from both the Braunston bypass pipeline and the flows from the reservoir;
- b. A new GUC transfer inlet for the Daventry Reservoir located within the same space currently occupied by the highway drainage structure;
- c. A new outlet structure for the Daventry Reservoir adjacent to the existing 1970s overflow and directly connected to the existing culverted spillway; and
- d. An approximate 450 mm diameter branch will feed the Drayton Reservoir. The existing outlet will be modified to accommodate flows from both the Braunston bypass pipeline and the flows from the reservoir.

18.4.37 The construction of these elements has the potential to give rise to construction phase noise and vibration effects.

18.4.38 It is noted that construction works for the majority of the above are expected to be of short duration in any given location, meaning that impact may be avoided by virtue of duration alone.

18.4.39 An increase in road traffic noise is possible due to traffic movements associated with the construction of Part 3. Therefore, changes in road traffic noise on all affected links, as identified as part of the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**), will be considered.

Operational Phase

18.4.40 There are no elements within Part 3 of the Proposed Development which are expected to generate significant levels of noise and/or vibration once operational and is therefore scoped out. As such, no operational study area will likely be required.

Part 4a: Abstraction, Storage and Treatment Site

18.4.41 Part 4a of the Proposed Development comprises:

- a. Weir to abstract water from Grand Union Canal;
- b. A new pumping station;
- c. Water storage;
- d. Water treatment works;
- e. Electrical buildings and kiosks for new power supply;
- f. Other associated above and below ground works, including pipework and landscaping;
- g. Access roads and car parking; and
- h. Temporary construction working areas and compounds.

18.4.42 The construction of these elements has the potential to give rise to construction phase noise and vibration effects.

18.4.43 There are two potential locations for the above elements, referred to as Site B and Site H, as shown in **Figure 3-4** in Volume 2 of this EIA Scoping Report. They are discussed in turn below.

Site B

Construction Phase

18.4.44 An increase in road traffic noise is possible due to traffic movements associated with the construction of Site B. Therefore, changes in road traffic noise on all affected links, as identified as part of the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**), will be considered.

Operational Phase

18.4.45 Various NVSRs have been identified around Site B, which include residences in Water Eaton, the nearest of which being the dwellings on Dere Place (145 m north-west), residential and non-residential receptors in and around Galley Lane Farm and Bryerley Springs Farm (30 m north-east), non-residential receptors and temporary moorings in and around Willowbridge

Marina (25 m west), The Lindens Care Home (200 m south-west) and various NSVRs along Mill Lane, including The Old Dairy Farm, Westfield Farm and West Lodge.

- 18.4.46 As a minimum, these receptors will be included in the study area for this aspect of the Proposed Development if this option is selected.
- 18.4.47 In addition to permanent receptor locations (e.g. dwellings and moorings), it is acknowledged that recreational users of canals often enjoy these areas in part due to their quiet, peaceful nature. Therefore, consideration will be given to potential noise effects on recreational users along GUC itself.
- 18.4.48 The elements described above do not contain operational phase plant which generates significant levels of vibration.
- 18.4.49 Furthermore, in the unlikely event that, at a later stage it becomes apparent that plant is required that does have the potential to generate significant levels of vibration, mitigation measures can be readily included in the design of these systems (e.g. anti vibration mounts, inertia bases) which will mitigate these emissions.
- 18.4.50 Therefore, vibration impacts during the operational phase are scoped out.

Site H

Construction Phase

- 18.4.51 The study area for the construction phase will be 300 m and 100 m for noise and vibration respectively.
- 18.4.52 An increase in road traffic noise is possible due to traffic movements associated with the construction of Part 4a, Site H. Therefore, changes in road traffic noise on all affected links, as identified as part of the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**), will be considered.

Operational Phase

- 18.4.53 Various NVSRs have been identified around Site B. These include Herdsman's Cottage (200 m north), dwellings in Slapton (adjacent east), Hill Farm (20 m south-east), Bridge Farm (140 m south), Horton Hill Farm (400 m west), and Whaddon Farm (560 m north-west).
- 18.4.54 As a minimum, these receptors will be included in the study area for this aspect of the Proposed Development if this option is selected.
- 18.4.55 In addition to permanent receptor locations (e.g. dwellings and moorings), it is acknowledged that recreational users of canals often enjoy these areas in part due to their quiet, peaceful nature. Therefore, consideration will be given to potential noise effects on recreational users along GUC itself.
- 18.4.56 The elements described above do not contain operational phase plant which will generate significant levels of vibration.
- 18.4.57 Furthermore, in the unlikely event that, at a later stage it becomes apparent that plant is required that does have the potential to generate significant levels of vibration, mitigation measures can be readily included in the design

of these systems (e.g. anti vibration mounts, inertia bases) which will mitigate these emissions.

18.4.58 Therefore, vibration impacts during the operational phase are scoped out.

Part 4b: Pipeline to Storage Reservoir near Luton

Construction Phase

18.4.59 Part 4b of the Proposed Development comprises:

- a. Pipeline to transfer water;
- b. Works to facilitate access;
- c. Temporary construction working areas and compounds; and
- d. Other associated above and below ground works relating to the pipeline.

18.4.60 The construction of these elements has the potential to give rise to construction phase noise and vibration effects.

18.4.61 Most of the pipeline will be installed using open cut methods. Where obstructions, such as major roads, rivers and railways prevent the use of open cut methods, the construction method will utilise trenchless techniques to install the new pipeline. The construction activities will be of relatively short duration in any given location; 20 m of pipeline is expected to be laid per day. Therefore, although included within the scope of the assessment, it is considered likely that adverse impact associated with construction noise and/or vibration will be avoided due to any works taking place in proximity to NVSRs being of short duration.

18.4.62 An increase in road traffic noise is possible due to traffic movements associated with the construction of Part 4b. Therefore, changes in road traffic noise on all affected links, as identified as part of the traffic and transport assessment (as described in **Chapter 20: Traffic and Transport**), will be considered.

Operational Phase

18.4.63 Once the pipeline is laid, no appreciable noise or vibration emissions will occur from this element. Therefore, noise and vibration impacts during the operational phase are scoped out.

Summary

18.4.64 **Table 18-3** provides a summary of the study areas by Proposed Development Part.

Table 18-3: Summary of Study Areas – Noise and Vibration

Reference point	Study Area
Part 1a: Minworth AWTP	Construction Phase: • 300 m from EIA Scoping Boundary for construction noise; • 100 m from EIA Scoping Boundary for construction vibration; Operational Phase:

Reference point	Study Area
	Up to and including nearest NVSRs in all directions from the AWTP.
Part 1b: Minworth to Atherstone Pipeline	Construction Phase: 300 m from EIA Scoping Boundary for construction noise; 100 m from EIA Scoping Boundary for construction vibration.
Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals	Construction Phase 300 m from EIA Scoping Boundary for construction noise; 100 m from EIA Scoping Boundary for construction vibration; Operational Phase: - Up to and including nearest NVSRs in all directions from the pumping stations and any other noise generating elements identified.
Part 3: Daventry and Drayton Reservoirs	Construction Phase: 300 m from EIA Scoping Boundary for construction noise; and 100 m from EIA Scoping Boundary for construction vibration. Operational Phase: - Up to and including nearest NVSRs in all directions from the pumping stations and any other noise generating elements identified.
Part 4a: Abstraction, Storage and Treatment	Construction Phase: 300 m from EIA Scoping Boundary for construction noise; 100 m from EIA Scoping Boundary for construction vibration; Operational Phase: - Up to and including nearest NVSRs in all directions from the water treatment works, pumping station and any other noise generating element identified.
Part 4b: Pipeline to storage reservoir near Luton	Construction Phase: 300 m from EIA Scoping Boundary for construction noise; and 100 m from EIA Scoping Boundary for construction vibration.

18.5 Baseline Conditions

Existing Baseline

- 18.5.1 This section provides a summary of the baseline conditions in respect of noise.
- 18.5.2 Given the age of the canal network and associated infrastructure, the Proposed Development does include elements that are sensitive to vibration.

However, the operation of the Proposed Development is not expected to generate significant vibration levels.

- 18.5.3 There is the potential for significant vibration levels to be generated during the construction phase, however the relevant criteria for assessing construction phase vibration (as discussed in Section 18.7 below) are absolute; i.e. not set relative to baseline vibration levels. In light of this, no vibration baseline surveys are necessary.
- 18.5.4 Noise baseline conditions are typically determined via a combination of quantitative measurement and qualitative observation (with regard to the acoustic environment) in and around the vicinity of the Proposed Development.
- 18.5.5 As the design progresses, a suite of baseline surveys to determine existing noise levels at particular elements of the Proposed Development will be conducted in accordance with BS 7445-2:1991 (Ref. 25) so that, wherever necessary, baseline levels are accurately quantified.
- 18.5.6 As discussed in Section 18.6, baseline levels are used to determine appropriate assessment criteria, both in terms of the construction and operational phase assessments.
- 18.5.7 Where feasible, conservative assumptions will be used to rule out impacts. For example, if it were possible to determine the absence of impact based on the most stringent limits available, it would be acceptable to omit the requirement to accurately quantify baseline levels for a given part of the Proposed Development.
- 18.5.8 Where this is not possible, an appropriate approach to quantifying baseline levels will be determined and implemented in collaboration with relevant stakeholders (e.g. local authority).

Part 1a: Minworth AWTP

- 18.5.9 Existing noise sources in the vicinity of Part 1a EIA Scoping Boundary are as follows:
 - a. Road traffic noise from the M6 Toll, M42 and the local road network (e.g. Kingsbury Road);
 - b. Commercial/industrial noise from the existing Minworth Wastewater Recycling Centre (WwRC) and other commercial operators (e.g. Prologis Park and Midpoint Park); and
 - c. Construction noise from nearby sections of High Speed 2 (HS2).
- 18.5.10 Existing baseline conditions in the vicinity of Part 1a EIA Scoping Boundary are therefore expected to be relatively high, although levels will reduce once the construction of HS2 is complete.
- 18.5.11 Baseline levels will be quantified via a combination of attended and unattended measurement at selected locations.

Part 1b: Minworth to Atherstone Pipeline

18.5.12 The proposed Minworth to Atherstone Pipeline (Part 1b EIA Scoping Boundary) covers an area approximately 18 km in length and it is expected that baseline conditions will vary along the route.

18.5.13 The majority of the pipeline route passes through predominately rural areas where there are few significant noise sources and therefore it is expected that existing sound levels would be low in these areas.

18.5.14 The exception is where the route passes in the vicinity of the M6 Toll, M42 and active HS2 construction sites where higher existing sound levels are expected.

18.5.15 Baseline levels will be quantified, where necessary, based on the likelihood of adverse impact associated with construction of the pipeline and BPT and operation of the BPT.

Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals

18.5.16 Due to the varied nature of the areas in which the Part 2 works are proposed, it is expected that baseline sound levels will vary from relatively high in urban areas to relatively low in more rural areas (e.g. around Fenny Stratford Lock).

18.5.17 Baseline levels will be quantified, where necessary, based on the likelihood of adverse impacts associated with the construction or operation of specific elements of the proposed Part 2 works.

Part 3: Daventry and Drayton Reservoirs

18.5.18 The Daventry Reservoir is located to the east of Daventry and Drayton Reservoir is located within Daventry Country Park Local Nature Reserve.

18.5.19 The existing acoustic environment at these receptors is expected to have contributions from road traffic noise, principally from the A45 but also from the local road network (e.g. Northern Way).

18.5.20 Baseline noise levels will be quantified, where necessary, based on the likelihood of adverse impact associated with the construction of specific elements of the proposed Part 3 works.

Part 4a: Abstraction, Storage and Treatment Site***Site B***

18.5.21 The principal noise source in the vicinity of Site B is road traffic noise from A4146 and, to a lesser extent, Stoke Road, Mill Lane, Galley Lane and Water Eaton.

18.5.22 If Site B is brought forward for the final scheme, baseline noise levels will be quantified via a combination of attended and unattended measurement.

Site H

18.5.23 The principal noise source in the vicinity of Site H is road traffic noise local roads such as the B488, Horton Road and, potentially, the A4146/A505. It is expected that baseline noise levels will be relatively low at this location.

18.5.24 If Site H is brought forward, baseline noise levels will be quantified via a combination of attended and unattended measurement.

Part 4b: Pipeline to a storage reservoir near Luton

18.5.25 The proposed Part 4b Pipeline EIA Scoping Boundary covers various potential routes. It is expected that baseline conditions will vary along the route.

18.5.26 The majority of the pipeline route passes through predominately rural areas where there are few significant noise sources. It is expected that existing sound levels will be low in these areas.

18.5.27 The exception is where the route passes in the vicinity of the A505 and A5183 where higher existing sound levels are expected.

18.5.28 Baseline levels will be quantified, where necessary, based on the likelihood of adverse impact associated with construction of the pipeline.

Future Baseline

18.5.29 For the majority of the Proposed Development (Parts 2, 3, 4a and 4b), future baseline is likely to remain similar to current baseline sound levels or experience slight increases due to increasing road traffic due to the typical increase in traffic flows that occur over time.

18.5.30 The exception to this is the sections of Part 1a and Part 1b of the Proposed Development which are in proximity to active HS2 construction sites. Baseline conditions at these locations are likely to reduce once the construction of HS2 is complete. However, ambient sound levels are likely increase (to a lesser extent) from levels present prior to the commencement of HS2 construction due to noise emissions from the operation of HS2.

18.5.31 Where sections of the Proposed Development are in proximity to HS2 construction sites, it will be necessary to conduct baseline surveys so that contributions from HS2 construction are not included in the measurements (e.g. surveying during periods when the construction sites are not active). This way, current baseline conditions can be quantified as they would exist in the absence of HS2 construction noise.

18.5.32 Use of the existing baseline levels (excluding construction noise) is considered conservative given that, as discussed below, criteria are derived from baseline levels and criteria based on lower, current, baseline levels will be more stringent than if criteria were derived from higher, future baseline levels.

18.5.33 For road traffic noise assessment, future baseline road traffic noise levels will be modelled, which will account for an increase in road traffic noise with committed developments. In addition, committed developments within the study area of the Proposed Development will be reviewed to identify, if these introduce any new NVSR to the effects of the Proposed Development.

18.6 Potential Effects

18.6.1 No indirect noise and vibration effects are identified to arise from the Proposed Development. All potential effects are considered direct.

Construction Phase

18.6.2 The scoping of potential effects from the Proposed Development during the construction phase is presented within **Table 18-4** below.

Table 18-4: Potential effects during the construction phase – Noise and Vibration

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Direct temporary noise impacts on sensitive receptors	In	All	The construction phases will include noise emitting activities which could temporarily increase noise levels at sensitive receptors. Construction will introduce additional road traffic which could temporarily increase road traffic noise levels at sensitive receptors.
Direct temporary vibration impacts on sensitive receptors (including canal infrastructure)	In	All	The construction phases will include vibration emitting activities which could temporarily increase vibration levels at sensitive receptors (including canal infrastructure).

Operational Phase

18.6.3 The scoping of potential effects from the Proposed Development during the operational phase is presented within **Table 18-5** below.

Table 18-5: Potential effects during the operational phase – Noise and Vibration

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Direct permanent noise impacts on sensitive receptors	In	Parts 1a, 1b (BPT only), 2 and 4a	The operational phase will include above ground noise emitting plant which may have a permanent effect on sensitive receptors.
Direct permanent noise impacts on sensitive receptors	Out	Parts 1b (excluding BPT), 3, Part 4b	Parts 1b and 4b pipeline and Part 3 do not include any noise emitting operational plant, as such, operational noise assessment for these elements of the Proposed Development is scoped out.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Direct permanent vibration impacts on sensitive receptors	Out	All	None of the proposed permanent installations are expected to generate levels of vibration that could potentially give rise to significant effects at nearby NVSRs. Furthermore, a commitment is made to ensure all relevant mechanical elements are fitted manufacturer recommended anti-vibration mounts and that the structure of each permanent installation provides an adequate level of vibration isolation such that no significant levels of vibration are emitted into the environment. Therefore, operational phase vibration impacts are scoped out.
Direct permanent noise impacts on sensitive receptors due to increased road traffic	Out	All	The Proposed Development is not expected to generate significant additional traffic flows once operational and will be primarily limited to operators of the Minworth AWTP (Part 1a) and abstraction, storage and treatment site in Part 4a, and maintenance visits, as required, to the two pipelines (Part 1b and 4b) and canal network (Parts 2 and 3). Therefore, no significant noise levels are anticipated during operation.

18.7 Approach to Assessment

Establishing Baseline Conditions

- 18.7.1 To assess the potential effects of the Proposed Development, it is necessary to determine the environmental conditions, resources and sensitive receptors that currently exist within the study area. These are known as 'baseline conditions' and have been considered in the context of this assessment.
- 18.7.2 The approach to baseline measurement is described in Section 18.5 above.

Assessment Methodology

- 18.7.3 The assessment will consider the potential impact of the Proposed Development under the following categories:
- Direct temporary construction noise generated by on-site activities;

- b. Direct temporary construction vibration generated by on-site activities; and
- c. Direct permanent operational noise impacts.

18.7.4 These are discussed in turn below.

Assessment Criteria

Sensitivity of Receptors

18.7.5 The sensitivity of receptors to noise and vibration is defined in **Table 18-6**.

Table 18-6: Sensitivity of receptors – Noise and Vibration

Sensitivity	Description	Examples of receptor usage
High	Receptors where noise will significantly affect the function of a receptor.	Auditoria/studios, specialist medical/teaching centres, and libraries.
Medium	Receptors where people or operations are particularly susceptible to noise.	Residential and student accommodation, permanent moorings, hotels, places of worship, conference facilities, schools, and hospitals/residential care homes. Certain ecological receptors.
Low	Receptors of low sensitivity to noise, where it may cause some distraction or disturbance.	Offices, restaurants, public houses, and sports grounds or facilities where noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf), Sections of the canal used recreationally, certain ecological receptors.
Very Low	Receptors where distraction or disturbance from noise is minimal.	Residences and other buildings not occupied during hours that an impact is experienced. Factories and industrial working environments with existing high noise levels, and Sports grounds or facilities where noise is a normal part of the event. Certain ecological receptors.

18.7.6 The following terminology will be used to define noise and vibration effects:

- a. Adverse – detrimental or negative effects to an environmental resource or receptor;
- b. Negligible – imperceptible effects to an environmental resource or receptor; and
- c. Beneficial – advantageous or positive effects to an environmental resource or receptor.

18.7.7 Where adverse or beneficial noise and vibration effects are identified, these are described using the following scale:

- a. Minor – slight, very short or highly localised effect,

- b. Moderate – limited effect (by extent, duration, or magnitude), which may be important at a local scale; and
- c. Major – considerable effect (by extent, duration, or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

18.7.8 The duration of noise and vibration effects is defined as follows:

- a. Temporary – noise and vibration effects during the construction phase; and
- b. Permanent – noise effects during the operational phase.

Magnitude of Impacts

Noise Policy Statement for England

18.7.9 The Explanatory Note within the NPSE (Ref. 4) introduces the following concepts to aid in the establishment of significant noise effects:

- a. No Observed Effect Level: the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- b. Lowest Observed Adverse Effect Level: the level above which adverse effects on health and quality of life can be detected; and
- c. Significant Observed Adverse Effect Level: the level above which significant adverse effects on health and quality of life occur.

18.7.10 This terminology will be adopted for the assessment. Further details on this document are given in **Table 18-1**.

Construction Noise

18.7.11 Noise due to construction works will be calculated and assessed in accordance with BS 5228-1:2009+A1:2014: Noise and Vibration Control on Construction and Open Sites – Noise (Ref. 26)

18.7.12 The ABC method set out in BS 5228-1:2009+A1:2014 will be used as the basis for defining criteria that assist in the assessment of potential significant effects at residential NSVRs. The ABC thresholds and notes regarding the definition of potential significant effects are reproduced in **Table 18-7**.

Table 18-7: BS 5228-1 ABC thresholds

Assessment Category and Threshold Value Period	Threshold Value $L_{Aeq, T}$ dB – Freefield		
	Category A (a)	Category B (b)	Category C (c)
Night-time (23:00-07:00)	45	50	55
Evenings and Weekends (d)	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75
NOTE 1: A potential significant effect is indicated if the $L_{Aeq, T}$ noise level arising from the Proposed Development Site exceeds the threshold level for the category appropriate to the ambient noise level.			

Assessment Category and Threshold Value Period	Threshold Value $L_{Aeq, T}$ dB – Freefield		
	Category A (a)	Category B (b)	Category C (c)
NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq, T}$ noise level for the period increases by more than 3 dB due to site noise.			
NOTE 3: Applies to residential receptors only.			
(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.			
(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.			
(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.			
(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.			

18.7.13 Based on the above, it is proposed that the magnitude of construction noise impacts on residential receptors is classified in accordance with the criteria in **Table 18-8**.

Table 18-8: Magnitude of Construction Noise Impacts for Residential NSVRs

Construction and Demolition Sound Level Above Threshold Level (dB)	Magnitude of Impact
Exceedance of ABC Threshold Value by $\geq +5$ dB	Major
Exceedance of ABC Threshold Value by up to +5 dB	Moderate
Equal to or below the ABC Threshold Value by up to -5dB	Minor
Below the ABC Threshold Value by ≥ -5 dB	Negligible

Construction Vibration

18.7.14 Construction vibration impacts will be assessed for all construction activities which are a potentially significant source of vibration proposed in close proximity of any identified potentially sensitive receptors using the calculation methodologies and/or data libraries presented in BS 5228 (Ref. 27).

18.7.15 These construction works are likely to comprise piling, and works using vibratory rollers such as earthworks, pavement construction (e.g. roads, footpaths).

18.7.16 The transmission of ground-borne vibration is highly dependent on the nature of the intervening ground between the source and receptor and the activities being undertaken. BS 5228 (Ref. 27) provides data on measured levels of vibration for various construction works. Vibration impacts are considered herein for both damage to buildings (including canal infrastructure) and annoyance to occupiers.

18.7.17 **Table 18-9** details Peak Particle Velocity (PPV) vibration levels and provides a semantic scale for the description of construction vibration effects on human receptors, based on guidance contained in BS 5228.

Table 18-9: Construction vibration criteria for human receptors (annoyance)

Peak particle velocity level	Description
10 mms ⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
1.0 mms ⁻¹	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
0.3 mms ⁻¹	Vibration might be just perceptible in residential environments.
0.14 mms ⁻¹	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.

18.7.18 Based on the above scale, the LOAEL for human receptors is defined as a PPV of 0.3 mms⁻¹ (millimetres per second), this being the point at which construction vibration is likely to become perceptible. The SOAEL is defined as a PPV of 1.0 mms⁻¹, this being the level at which construction vibration can be tolerated, but only with prior warning.

18.7.19 In addition to human annoyance, building structures (including canal infrastructure) may be damaged by high levels of vibration. The levels of vibration that may cause building damage are far in excess of those that may cause human annoyance. Consequently, if vibration levels within buildings are controlled to those relating to annoyance (i.e. 1.0 mms⁻¹), then it is highly unlikely that buildings will be damaged by construction vibration.

18.7.20 BS 7385-2:1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration (Ref. 28) provides guidance on vibration levels likely to result in cosmetic damage and is referenced in BS 5228 (Ref. 27). Guide values for transient vibration, above which cosmetic damage could occur, are given in **Table 18-10**.

Table 18-10: Transient vibration guide values for cosmetic damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4Hz to 15Hz	15Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50 mms ⁻¹ at 4Hz and above	
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mms ⁻¹ at 4Hz increasing to 20 mms ⁻¹ at 15Hz	20 mms ⁻¹ at 15Hz increasing to 50 mms ⁻¹ at 40Hz and above.
NOTE 1: Values referred to are at the base of the building.		

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4Hz to 15Hz	15Hz and above
NOTE 2: For un-reinforced or light framed structures and residential or light commercial buildings, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.		

18.7.21 BS 7385-2 states that for transient vibration, such as from individual impacts, the probability of building damage tends towards zero at levels less than 12.5 mms^{-1} PPV. For continuous vibration, such as from vibratory rollers, the threshold is around half this value.

18.7.22 It is also noted that these values refer to the likelihood of cosmetic damage. ISO 4866:2010 'Mechanical Vibration and Shock Vibration of Fixed Structures: Guidelines for the Measurement of Vibrations and Evaluation of their Effects on Structures' (Ref. 38) defines three different categories of building damage¹, namely:

- a. Cosmetic: formation of hairline cracks in plaster or drywall surfaces and in mortar joints of brick or concrete block constructions;
- b. Minor: formation of large cracks or loosening and falling of plaster or drywall surfaces or cracks through brick or blocks; and
- c. Major: damage to structural elements, cracks in support columns, loosening of joints, splaying of masonry cracks.

18.7.23 BS 7385-2 states that minor damage occurs at a vibration level twice that of cosmetic damage, and that major damage occurs at a vibration level twice that of minor damage. Therefore, this guidance has been used to define vibration criteria as detailed in **Table 18-11** which can be used to assess continuous vibration impacts.

Table 18-11: Construction vibration criteria for assessing building damage

Damage risk	Continuous vibration level PPV mms^{-1}
Major	30
Moderate	15
Minor	6
Negligible	<6

18.7.24 Vibration generated by the construction of the Proposed Development also has the potential to impact structural elements of the canal network.

18.7.25 There is no specific guidance on vibration damage to the structure components of a canal, the following recommendation from section B.2.4 of BS 5228 (Ref. 27) for a retaining wall have been used instead. This states:

¹ Building damage due to vibration will also be considered from a cultural heritage perspective, see **Chapter 11: Cultural Heritage**.

“Unlike conventional buildings, which are tied together by crosswalls, intermediate floors and roofs, retaining walls might have little lateral restraint near their tops. This can result in substantial amplification of vibrations particularly in the horizontal mode normal to the plane of the wall. Amplification factors of between 3 and 5 are typical. For slender and potentially sensitive masonry walls, it is recommended that threshold limits for PPV of 10 mm·s⁻¹ at the toe and 40 mm·s⁻¹ at the crest should generally be adopted. Propped or tied walls or mass gravity walls can be subject to values 50% to 100% greater than these limits. Similar values could be applied to well-supported steel pile and reinforced concrete retaining walls. Where walls are in poor condition, the allowable values should be diminished and at the same time additional propping or other methods of support should be devised. For continuous vibrations, all the above levels should be reduced by a factor of 1.5 to 2.5 according to individual circumstances.”

- 18.7.26 The project will initially take a conservative approach by reducing the above PPV threshold limits (at the crest) by 50 percent. These values may increase following structural surveys of the locks and/or once monitoring data has been analysed.

Construction Road Traffic Noise

- 18.7.27 Road traffic noise level changes at NSVRs due to construction traffic on public roads will be assessed according to the methods given in CRTN (Ref. 32). The assessment will consider the change in the Basic Noise Level (BNL) along public routes used by construction vehicles.
- 18.7.28 The criteria for the assessment of traffic noise changes arising from construction works are proposed to be taken from Table 3.17 of DMRB (Ref. 33) and are provided in **Table 18-12**.

Table 18-12: Construction Traffic Noise Criteria

Magnitude of Impact	Short-term noise change (dB, L _{A10} , 18hr)
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	Less than 1.0

- 18.7.29 Where necessary, the significance of the effect of these changes will be assessed based on a range of relevant guidance including the DMRB LA 111 (Revision 2) (Ref. 33).

Operational Noise

- 18.7.30 The impacts from operation noise due to fixed plant will be assessed in accordance with BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (Ref. 30).
- 18.7.31 BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The method compares the *rating level* of the sound source under consideration with the background sound level in the vicinity of residential locations. The relevant parameters are as follows:

- a. Ambient sound level, L_a , $L_{Aeq,T}$ dB – ambient sound is defined in the standard as the ‘totally encompassing sound in a given situation at a given time, usually from many sources near and far’. The ambient sound comprises the residual sound and the specific sound when present;
- b. Residual sound level, L_r , $L_{Aeq,T}$ dB – residual sound is defined in the standard as the ‘ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound’;
- c. Specific sound level, L_s , $L_{Aeq,Tr}$ dB – the specific sound source is defined in the standard as the ‘sound source being assessed’, with the specific sound level being specified at the assessment location over a given reference time interval, Tr ;
- d. Background sound level, $L_{A90,T}$ dB – defined in the standard as the ‘A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T , measured using time weighting F and quoted to the nearest whole number of decibels’; and
- e. Rating level, $L_{Ar,Tr}$ dB – defined as ‘the specific sound level plus any adjustment made for the characteristic features of the sound’;
 - i. Up to 6 dB for tonal characteristics, Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible;
 - ii. Up to 9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible;
 - iii. If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied; and
 - iv. Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

18.7.32 When comparing the *background* and the *rating sound levels*, the standard states that:

- f. *“Typically, the greater the difference, the greater the magnitude of impact.”*
- g. *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.*
- h. *A difference of around +5 dB is likely to be an indication of an adverse impact, depending upon the context.*
- i. *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an*

adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon the context.”

18.7.33 Importantly, as indicated above, BS 4142 requires that the *rating level* of the sound source under assessment be considered in the context of the environment when defining the overall significance of the impact. The standard suggests that in assessing the context, all pertinent factors should be taken into consideration, including the following:

- a. *“The absolute level of sound;*
- b. *The character and level of the residual sound compared to the character and level of the specific sound; and*
- c. *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.”*

18.7.34 Based on the above guidance, and subject to context, a difference of + 5dB between the rating level and the background sound level is considered to be the SOAEL and a difference of 0 dB is considered to be the LOAEL. Hence, the magnitude of impact will be determined based on the difference between the rating level and the background sound level as below, subject to consideration of context:

- a. Major: +5 dB or greater;
- b. Moderate: 0 dB to + 5dB;
- c. Minor: 0 dB to -10 dB; and
- d. Negligible: -10 dB or below.

Noise and/or Vibration Impacts on Ecological Receptors

18.7.35 There is the potential for noise and/or vibration emissions during the construction and operational phases of the Proposed Development to give rise to impacts on ecological receptor locations. These impacts will be considered in **Chapter 12: Ecology – Aquatic** and **Chapter 13: Ecology – Terrestrial**.

Effect Significance

18.7.36 **Table 18-13** provides a matrix showing the significance of effects depending on the sensitivity of receptors and magnitude of impact. The assignment of magnitude of impacts is discussed further in the following sections for the different types of potential impact from the Proposed Development.

Table 18-13: Significance criteria – Noise and Vibration

Sensitivity or value of resource / receptor	Magnitude of impact			
	Major	Moderate	Minor	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible

Sensitivity or value of resource / receptor	Magnitude of impact			
	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

18.7.37 Generally, effects classed from negligible to minor are not significant, whereas effects classed from moderate to major adverse are significant. However, final determination of whether effects are likely to be significant has been made following the classification of effects and using professional judgment. These include consideration of the duration, frequency and likelihood of noise and vibration effects and whether they are temporary or permanent and the area and number of receptors affected.

18.8 Assumptions, Limitations, and Uncertainties

Baseline

- 18.8.1 Any measurement of existing ambient or background sound levels will be subject to a degree of uncertainty; environmental sound levels are subject to various factors, including seasonal and daily variation, meteorological effects and changes in traffic flows (e.g. school holidays). Hence, any measurement survey can only provide a sample of the ambient levels.
- 18.8.2 Every effort will be made so that measurements are undertaken in a way as to provide a representative sample of conditions. However, some uncertainty will remain in the values taken from such a survey.

Construction noise and vibration

- 18.8.3 Predictions will be undertaken using BS 5228-1 and BS 5228-2 methodologies for construction noise and vibration respectively. These predictions will be based on information relating to the proposed construction activities provided by relevant specialists within the wider design team.
- 18.8.4 These prediction methodologies carry an inherent level of uncertainty; however, this will be minimised through the use of conservative worst case assumptions.

Operational noise

- 18.8.5 The following elements of the Proposed Development have the potential to generate appreciable noise levels once operational:
- Part 1a – Minworth AWTP;
 - Part 1b – BPT;
 - Part 2 – outfall point at Atherstone;
 - Part 2 – various pumping stations; and
 - Part 4a – Abstraction, Storage and Treatment Site.

- 18.8.6 Noise emission data for the proposed plant will be used to calculate noise levels at nearby NVSR locations using relevant standards and methodologies (e.g. ISO 9613-2:2024(Ref. 37)) and assessed against relevant criteria derived from measured and/or assumed baseline levels using BS 4142:2014 (Ref. 30).
- 18.8.7 There is an inherent level of uncertainty within the prediction methodology, however this will be minimised through the use of conservative worst-case assumptions.
- 18.8.8 The assessment methodology (BS 4142) has specific details on the way to address uncertainty. This guidance will be followed as and where appropriate.

18.9 Approach to Mitigation

- 18.9.1 Mitigation for noise and vibration impacts will be considered where necessary for the protection of sensitive receptors in the vicinity of the proposed development.
- 18.9.2 The NPSWRI (Ref. 2) outlines different mitigation options that can be used. Paragraph 4.11.8 of the NPSWRI states:

“Mitigation measures for the project should be proportionate and reasonable and may include one or more of the following:

- a. Engineering: reduction of noise at point of generation and containment of noise generated;*
- b. Materials: use of materials that reduce noise;*
- c. Lay-out: adequate distance between source and noise-sensitive receptors; incorporating good design to minimise noise transmissions through screening by natural or purpose-built barriers or buildings; and*
- d. Administration: restricting activities allowed on the site, either during construction and/or operation such as specifying acceptable noise limits or times of use (for example, any facilities needing to use a public announcement system).”*

- 18.9.3 The NPSWRI goes on to state at Paragraph 4.11.8 that *“This should also take into account seasonality of wildlife in any nearby designated sites”* (refer to **Chapter 13: Ecology – Terrestrial** of this EIA Scoping Report).
- 18.9.4 Where impacts are predicted during the construction phase, guidance taken from BS 5228 (Ref. 26 and Ref. 27) will be adopted where appropriate.
- 18.9.5 Furthermore, the Environmental Statement will be accompanied by a Code of Construction Practice (CoCP) that will set out the specific measures that will be adopted by the appointed contractor.
- 18.9.6 In consultation with designers, the Canal & River Trust (the ‘Trust’), and early construction contractors, the need for vibration monitoring during construction will be reviewed during the EIA.
- 18.9.7 Where impacts are predicted during the operational phase, this will be reviewed with the wider design team and noise mitigation measures will be

provided in accordance with the EIA mitigation hierarchy (avoid, prevent or reduce).

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<https://iris.who.int/bitstream/handle/10665/279952/9789289053563-eng.pdf?sequence=1> [Accessed 21/03/2025].

Ref. 37 ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors.

Ref. 38 ISO 4866:2010 (2010) Mechanical vibration and shock — Vibration of fixed structures — Guidelines for the measurement of vibrations and evaluation of their effects on structures.

Chapter 19: Socio-economics

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19. Socio-economics

19.1 Introduction

19.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on socio-economic receptors.

19.1.2 This includes potential impacts on the following:

- a. Direct and indirect employment;
- b. Training and apprenticeship opportunities;
- c. Gross value added (GVA);
- d. Users of public rights of way (PRoW) and the canal network;
- e. Local and private assets (including residential properties, development land, local businesses (including agricultural businesses), community facilities, open space, recreation and leisure, and visitor attractions); and
- f. Tourism.

19.2 Legislation, Planning Policy Context, and Guidance

19.2.1 Legislation, planning policy and guidance relating to socio-economics is outlined below.

Legislation

19.2.2 The applicable legislation includes The Infrastructure Planning (Environmental Impact Assessment [EIA]) Regulations 2017 (as amended) (Ref. 1). In regard to socio-economics specifically, there is no legislation to inform the proposed scope and method of assessment.

National Policies, Plans and Strategies

19.2.3 The relevant national policies, plans and strategies for socio-economics are summarised within **Table 19-1** below. These documents have informed the assessment scope and methodology.

Table 19-1: National policies, plans and strategies – Socio-economics

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 2)	Section 4.10 Land use, paragraphs 4.10.1 – 4.10.21 set out requirements for the assessment and mitigation of impacts on development land, existing open space, sports and recreational facilities, public rights of way, National Trails and other rights of access. Section 4.13 Socio-economic impacts, paragraphs 4.13.1 – 4.13.11 set out requirements for applicants to consider socio-economic impacts.	The NPSWRI informs socio-economic assessment methodology, baseline and mitigation.
National Planning Policy Framework (NPPF) (Ref. 3)	Paragraph 8 sets out the overarching presumption in favour of sustainable development which incorporates economic, social and environmental objectives. Paragraph 85 emphasises that planning decisions should give significant weight on the need to support economic growth and local business needs.	The NPPF informs the socio-economic assessment, emphasising the need to consider local businesses and economic growth.

Local Policy

- 19.2.4 The local policies listed in **Table 19-2** are considered relevant to the scope and method of assessment of potential socio-economic impacts presented in this chapter.

Table 19-2: List of relevant local policy – Socio-economics

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • Policy TP26 Local employment; • Policy TP39 Walking; and • Policy TP9 Open space, playing fields and allotments.	Ref. 4	Policy TP26 – encourages applicants to sign up to training and recruitment targets for local people. Policy TP39 – emphasises the need to promote pleasant walking environments. Policy TP9 – emphasises the need for assessments to consider open space.
	New Local Plan for Birmingham 2042: • Policy CE13 Open space; and • Policy PG1 Overall Levels of Growth.	Ref. 5	Policy CE13 – outlines the Council's guidance for developments that impact upon open spaces. Policy PG1 – outlines the Council's approach to growth in Birmingham.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • LP11 Economic regeneration; and • LP22 Open Spaces and Recreational Provision.	Ref. 6	LP11 – emphasises that employment-generating projects should improve employment choice and opportunities for local people. LP22 – states the importance of open spaces and how they should be retained where possible.
Warwickshire County Council	Economic Growth Strategy for Warwickshire 2024-2034. The Economic Growth Strategy for Warwickshire has three priorities to ensure the Council's vision 'to make Warwickshire the best that it can be, now and in the future' is successful: • Priority 1: Ambitious growth – building on current sector strengths and supporting emerging sectors; • Priority 2: Inclusive growth – tackle existing inequalities, align skills to the needs of	Ref. 7	The Economic Growth Strategy outlines the economic priorities for Warwickshire County Council. The Strategy provides context as to what the economic benefits of the Proposed Development will be contributing to.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	industries and collaborate with skills and education providers; and • Priority 3: Sustainable growth - reduce carbon emissions and promote eco-friendly practices across businesses and communities.		
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: • Policy E1 Nature of employment growth; • Policy NE2 Open space; and • Policy DS1 Presumption in favour of sustainable development.	Ref. 8	Policy E1 – emphasises that applications that provide permanent jobs and training schemes will be considered favourably. Policy NE2 – sets out actions applicants should consider in relation to open space. Policy DS1 – emphasises the importance of proposals contributing to positive changes in economic, social and environmental conditions.
	Borough Plan Review 2021-2039: • Policy DS1 Presumption in Favour of Sustainable Development; • Policy HS4 Retaining Community Facilities; and • Policy NE2 Open Space.	Ref. 9	Policy DS1 – outlines the Council's sustainable development principles. Policy HS4 – outlines the Council's requirements for developments that impact upon community facilities. Policy NE2 – outlines the importance of open spaces and the importance of retaining them.
Coventry City Council	Coventry Local Plan (2011-2031): • Policy JE1: Overall Economy and Employment Strategy; and • Policy IM1: Developer Contributions for Infrastructure.	Ref. 10	Policy JE1 – outlines the Council's priorities regarding employment. Policy IM1– outlines the requirement for application to mitigate any negative impacts they cause.
	Local Plan Review: Issues and Options Consultation (2023):	Ref. 11	Policy DS3 – outlines the need to update the policy to reflect the priorities of the One Coventry Plan and of the emerging Climate Change Strategy.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy DS3 Sustainable Development Policy; and - Policy JE1 Overall Economy and Employment Strategy.		Policy JE1 – outlines the Council's growth strategy.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: Policy GP1 Securing Sustainable Development.	Ref. 12	Policy GP1 – highlights the Council's focus in favour of sustainable development in line with the NPPF.
	Rugby Borough Local Plan review – issues and options consultation (2023).	Ref. 13	The Rugby Borough Local Plan Review outlines potential changes to the Rugby Borough Local Plan due to changes in national policy.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: - Policy SA Presumption in Favour of Sustainable Development; - Policy S7 Provision of Jobs; and - Policy E6 Education, Skills and Training.	Ref. 14	Policy SA – sets out the Council's focus in favour of sustainable development. Policy S7 – sets out the Council's targets for employment growth till 2029. Policy E6 – highlights that the Council will support training and employment agreements for the local workforce.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: Policy SP1 Daventry District Spatial Strategy.	Ref. 15	Policy SP1 – outlines sustainable development principles in Daventry.
	New Local Plan for West Northamptonshire 2041: Policy PL11 - Community and Sport Facilities, Open Space and Allotments.	Ref. 16	Policy PL11 – outlines the importance of open space and community facility receptors and the need to protect them.
Milton Keynes City Council	Plan: MK 2016 – 2031:	Ref. 17	Policy DS3 – sets out the Council's strategy for increasing employment.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Policy DS3 Employment Development Strategy.		
	New City Plan: Ambition and Objectives Consultation 2023.	Ref. 18	The consultation outlines objectives to be covered in the New City Plan, with reference to economic growth and the protection of open space.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: Policy S1 Sustainable development for Aylesbury Vale.	Ref. 19	Policy S1 – sets out the sustainable development principles Plan.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives.	Ref. 20	The Draft Vision and Objectives sets out 8 objectives for Buckinghamshire to achieve by 2040, including economy and jobs; infrastructure; and natural and built environment.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: - Policy SP1 Growth Strategy; and - Policy EE11: The River and Waterway Network.	Ref. 21	Policy SP1 – sets out growth targets for Central Bedfordshire. Policy EE11 – sets out the Council's agenda for developments adjacent to the waterway network.

Guidance and Standards

19.2.5 Relevant guidance and standards which have been used as part of the scoping process are listed below and will also be taken into account as part of the EIA include:

- a. Planning Practice Guidance (Ref. 22);
- b. Department for Levelling Up, Housing & Communities (now the Ministry of Housing, Communities & Local Government) Appraisal Guide (Ref. 23);
- c. Homes and Communities Agency Additionality Guide (Ref. 24); and
- d. Green Book (Ref. 25).

19.3 Consultation

19.3.1 During non-statutory consultation, the following socio-economic related matters were raised and will be considered as part of the scope of assessment:

- a. Potential impact on buildings;
- b. Potential disturbance to residents and businesses;
- c. Potential temporary loss of canal moorings during construction;
- d. Potential impact on canal-based leisure and recreational activities and businesses;
- e. Potential for noise and dust during construction;
- f. Potential impact on access to property during construction;
- g. Potential impact of road closures during construction;
- h. Potential impacts of public rights of way and towpaths; and
- i. Potential for community, leisure and recreation benefits.

19.3.2 Further consultation will be undertaken with individual users (businesses and recreational/leisure operators) post-scoping as appropriate to understand how they use the waterways and its facilities.

19.4 Study Area

19.4.1 The study area for socio-economics varies depending on the effect or type of resource being assessed.

19.4.2 The potential economic and employment impacts arising from the Proposed Development are considered relative to a study area that represents the principal labour market catchment area for the Proposed Development. This will be derived based on analysis of reasonable travel times to the Proposed Development.

19.4.3 The assessment will consider direct effects on existing and future local and private assets and recreational receptors (receptors including PRow, the canal network, residential facilities, businesses, visitor attractions and community facilities). This will include receptors within the EIA Scoping Boundary and the immediately adjacent land.

- 19.4.4 The study area for indirect effects on local and private assets and recreational receptors (including PRow, the canal network, residential facilities, businesses, visitor attractions and community facilities) will be extended to include communities that may potentially be affected by the Proposed Development, for example through access or severance impacts. These will include communities directly connected by the recreational routes, towpaths and PRow.
- 19.4.5 The study area for the assessment of impacts on agricultural businesses includes the EIA Scoping Boundary only.

19.5 Baseline Conditions

- 19.5.1 This section provides a summary of the baseline conditions in respect of socio-economics. The baseline is separated into two sections: the socio-economic profile and local receptors.

Socio-Economic Profile

- 19.5.2 The key socio-economic indicators used to establish an overview of the baseline conditions of the study area have been collected at the national and local authority level. The local authorities that the Proposed Development crosses are as follows: Birmingham City Council; North Warwickshire Borough Council; Nuneaton and Bedworth Borough Council; Coventry City Council; Rugby Borough Council; West Northamptonshire Council; Milton Keynes City Council; Buckinghamshire Council; and Central Bedfordshire Council. Luton Borough Council is not within the EIA Scoping Boundary but, due to its close proximity baseline conditions for the local authority have been presented below.

Population

- 19.5.3 **Table 19-3** below shows the population of all the geographies using data from the 2021 Census (Ref. 26). There is a total of 3,658,300 people residing within the local authorities in the study area, constituting approximately 6.0% of England's population (56,490,000). Of the local authorities, Birmingham has the largest population (1,144,900), substantially greater than the second largest in Buckinghamshire (553,100). The least populated local authority is North Warwickshire (65,000).

Table 19-3: Population by local authority

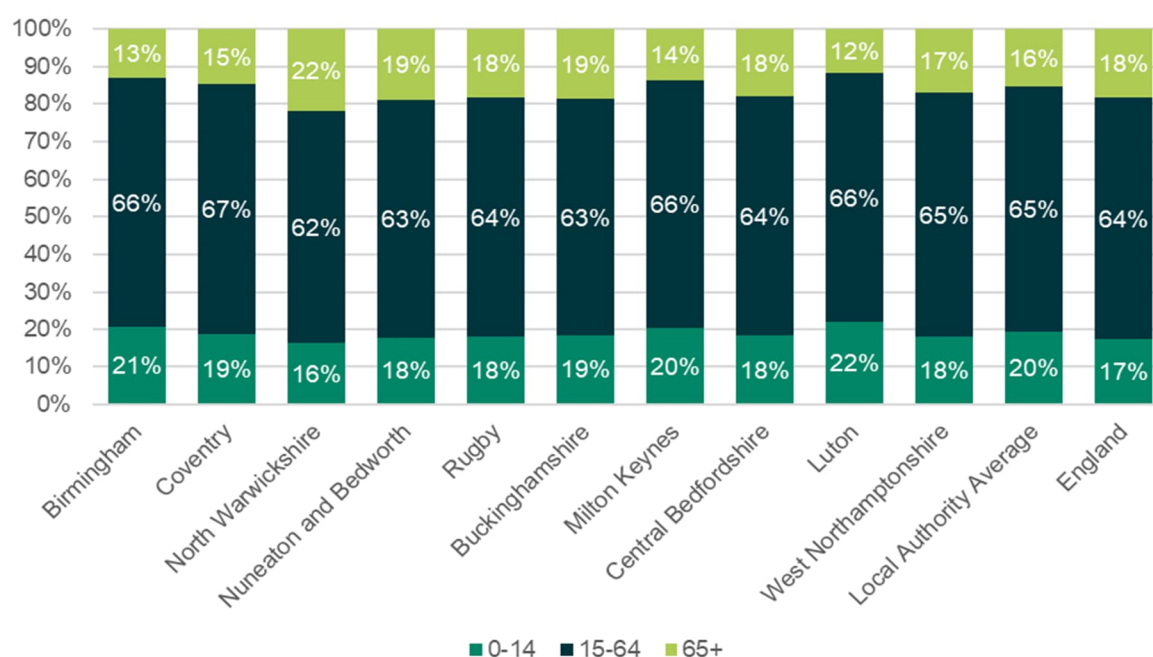
Local Authority	Population
England	56,490,000
Birmingham	1,144,900
Buckinghamshire	553,100
West Northamptonshire	425,700
Coventry	345,300
Central Bedfordshire	294,300
Milton Keynes	287,100
Luton	225,300
Nuneaton and Bedworth	134,200

Local Authority	Population
Rugby	114,200
North Warwickshire	65,000
Local Authority Average	347,490

[Source: Office for National Statistics (ONS) (2022) Census 2021]

19.5.4 **Plate 19-1** below depicts the age profile of the local authorities and can help to indicate any future trends and any signs of an ageing population. All the local authorities in the study area have a larger proportion of people aged 0-14 compared to England (17.4%), with the exception of North Warwickshire (16.1%). A large share of the local authorities have a lower proportion of people aged 65+ compared to England (18.4%); North Warwickshire (21.9%), Nuneaton and Bedworth (19.1%) and Buckinghamshire (18.8%) were the exception to this. The largest working age population proportion is in Coventry, where 66.7% of the population are aged between 15-64, greater than England's 64.2%.

Plate 19-1: Population Cohorts by Age Group



[Source: ONS (2022) Census 2021]

Economic Activity

19.5.5 The 2021 Census also provides data on economic activity, which indicates trends in employment, unemployment, and economic inactivity within an area. In the study area, the proportion of economically active individuals ranged from 52.1% in Birmingham to 64.9% in Milton Keynes, averaging 60.4% across the local authorities. This is a greater proportion than England, where 58.6% of the population were considered economically active. Generally, the study area performed well compared to national levels; seven of the ten local authorities had higher economic activity levels compared to England as shown in **Table 19-4**. Similarly, six of the local authorities also had a lower unemployment rate than England (2.9%).

Table 19-4: Economic Activity

Local Authority	Economically active (excl. full-time students) (%)	Employee: Part-time (%)	Employee: Full-time (%)	Self-employed (%)	Unemployed (%)	Economically Active Full-time Student (%)	Economically Inactive (%)
Birmingham	52.1	11.4	28.7	7.3	4.7	3.5	44.4
North Warwickshire	60.2	12.2	36.4	9.2	2.4	1.5	38.4
Nuneaton and Bedworth	59.6	12.3	37.8	6.8	2.8	1.7	38.7
Coventry	54.4	10.6	33.8	6.7	3.4	4.7	40.9
Rugby	63.6	11.4	41.5	8.5	2.1	1.9	34.5
West Northamptonshire	63.3	11.5	39.1	10.2	2.4	2.6	34.1
Milton Keynes	64.9	11.5	41.5	8.8	3.1	2.6	32.5
Buckinghamshire	62.7	11.4	36.8	12.1	2.4	1.7	35.6
Central Bedfordshire	64.6	12.0	39.9	10.6	2.2	1.8	33.6
Luton	58.4	12.1	32.3	9.7	4.2	4.0	37.6
England	58.6	11.9	34.3	9.5	2.9	2.3	39.1

[Source: ONS (2022) Census 2021. Note: Economic activity measures if an individual was an active participant in the labour market during this period. Unemployed individuals are considered economically active and are those who are looking for employment but unable to acquire it. Economically inactive individuals are those who do not participate in the labour market and include individuals who are retired, students, disabled etc.]

Qualifications

- 19.5.6 **Table 19-5** shows the educational attainment of the study area's population based on Census 2021 data. The average proportion of the local authorities' populations with no qualifications was 18.9%, higher than that of England (18.1%). England had a greater proportion of individuals with level 4+ qualifications¹ (33.9%) compared to the study area, which averaged 31.6%. There was however a large variation between the local authorities comprising the study area; Buckinghamshire is relatively highly educated with 41.0% of the population with level 4+ qualifications and only 13.8% with no qualifications, whereas local authorities like Nuneaton and Bedworth had substantially fewer people educated to degree level and above. In the case of Nuneaton and Bedworth, only 24.5% of the population was educated to level 4+, bringing down the study area average to less than that of England.

¹ Level 1 and entry level qualifications include 1 to 4 GCSEs grade A* to C, Any GCSEs at other grades, O levels or CSEs (any grades), 1 AS level, NVQ level 1, Foundation GNVQ, Basic or Essential Skills. Level 2 qualifications include 5 or more GCSEs (A* to C or 9 to 4), O levels (passes), CSEs (grade 1), School Certification, 1 A level, 2 to 3 AS levels, VCEs, Intermediate or Higher Diploma, Welsh Baccalaureate Intermediate Diploma, NVQ level 2, Intermediate GNVQ, City and Guilds Craft, BTEC First or General Diploma, RSA Diploma. Level 3 qualifications include 2 or more A levels or VCEs, 4 or more AS levels, Higher School Certificate, Progression or Advanced Diploma, Welsh Baccalaureate Advance Diploma, NVQ level 3; Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma. Level 4 qualifications or above include degree (BA, BSc), higher degree (MA, PhD, PGCE), NVQ level 4 to 5, HNC, HND, RSA Higher Diploma, BTEC Higher level, professional qualifications (for example, teaching, nursing, accountancy).

Table 19-5: Qualifications

Local Authority	No qualifications (%)	Level 1 and entry level qualifications (%)	Level 2 qualifications (%)	Level 3 qualifications (%)	Level 4 qualifications or above (%)
Birmingham	23.9	10.1	12.5	17.1	29.9
North Warwickshire	22.2	11.5	15.3	17.6	24.8
Nuneaton and Bedworth	22.6	11.9	15.0	17.0	24.5
Coventry	19.4	9.9	12.6	19.0	30.6
Rugby	15.7	9.7	14.0	16.4	34.9
West Northamptonshire	17.4	10.9	14.3	16.9	31.8
Milton Keynes	15.8	10.9	14.2	15.7	35.8
Buckinghamshire	13.8	8.9	13.4	15.7	41.0
Central Bedfordshire	15.0	10.4	14.7	18.2	33.2
Luton	22.9	11.4	12.7	14.4	29.8
Average	18.9	10.6	13.9	16.8	31.6
England	18.1	9.7	13.3	16.9	33.9

[Source: ONS (2022) Census 2021]

Industries

- 19.5.7 The Business Register and Employment Survey 2022 (Ref. 27) provides data on the levels of employment across industries in the study area, as can be seen in **Table 19-6**. Across the nine local authorities, the largest employment industries on average are health (11.2%), business administration & support services (11.2%), transport & storage (inc. postal) (9.4%) and manufacturing (8.9%). Similarly, in England, the largest employment industry is also health (13.2%). The transport & storage (inc. postal) sector is much more concentrated in the study area compared to England (5.1%).

Table 19-6: Industry Employment Distribution Across the Study Area (%)

Industry	Birmingham	North Warwickshire	Nuneaton and Bedworth	Coventry	Rugby	West Northamptonshire	Milton Keynes	Buckinghamshire	Central Bedfordshire	Luton	Average	England
1 : Agriculture, forestry & fishing	0.0	0.3	0.1	0.0	0.4	0.5	0.1	0.7	1.2	0.0	0.3	0.6
2 : Mining, quarrying & utilities	0.6	0.9	0.4	3.7	4.6	1.0	0.7	1.0	0.3	0.2	1.3	1.1
3 : Manufacturing	6.1	13.2	11.4	9.2	13.0	7.7	5.6	6.9	10.4	5.6	8.9	7.5
4 : Construction	3.3	8.5	3.4	2.5	4.6	5.0	2.8	5.6	7.5	3.7	4.7	4.8
5 : Motor trades	1.3	8.5	2.8	2.5	1.9	3.2	3.3	2.0	3.3	1.6	3.0	1.7
6 : Wholesale	3.9	5.7	5.1	3.7	3.2	5.5	6.1	7.7	5.7	3.2	5.0	3.9
7 : Retail	7.5	3.8	8.0	7.4	7.4	6.8	7.8	8.1	8.5	5.6	7.1	8.5
8 : Transport & storage (inc. postal)	4.4	20.8	9.1	5.5	14.8	10.5	9.4	3.2	7.5	8.3	9.4	5.1
9 : Accommodation & food services	6.2	6.6	5.7	5.5	7.4	5.9	5.6	6.5	9.4	5.6	6.4	7.9
10 : Information & communication	3.3	1.9	2.0	2.1	2.8	2.3	6.7	6.0	2.4	1.9	3.1	4.8
11 : Financial & insurance	4.2	0.5	1.1	2.8	0.9	3.2	5.0	1.4	0.7	0.5	2.0	3.3
12 : Property	2.8	0.9	1.6	2.1	1.9	1.1	2.2	1.8	3.3	2.1	2.0	1.9
13 : Professional, scientific & technical	11.4	9.4	5.1	6.7	11.1	7.3	7.8	9.3	6.6	5.6	8.0	9.4
14 : Business administration & support services	9.0	6.6	9.1	10.4	5.6	10.5	8.3	11.3	8.5	32.4	11.2	9.2
15 : Public administration & defence	5.9	0.8	4.0	4.3	2.3	4.1	2.8	2.8	3.3	3.2	3.4	4.3

Industry	Birmingham	North Warwickshire	Nuneaton and Bedworth	Coventry	Rugby	West Northamptonshire	Milton Keynes	Buckinghamshire	Central Bedfordshire	Luton	Average	England
16 : Education	9.2	3.8	9.1	14.1	7.4	6.4	10.0	9.3	10.4	7.4	8.7	8.5
17 : Health	17.1	4.2	18.2	14.1	7.4	14.5	9.4	11.3	5.7	10.2	11.2	13.2
18 : Arts, entertainment, recreation & other services	4.2	2.8	4.0	3.7	3.2	4.1	5.0	4.8	5.7	2.8	4.0	4.3

[Source: ONS (2023) Business Register and Employment Survey 2022]

Deprivation

- 19.5.8 The Index of Multiple Deprivation (IMD) Score (Ref. 28) is an overall measure of multiple deprivation experienced by people living in an area. The 2019 Index of Deprivation is based on 37 indicators across seven domains of deprivation. These are combined using appropriate weighting to give an overall IMD score. Using a standardised scoring system like this allows areas to be compared based on their overall deprivation. IMD data are available at the local authority level and thus can indicate levels of the deprivation in the study area².
- 19.5.9 As seen in **Table 19-7** below, out of the eight local authorities with English IMD data available³, Birmingham has the lowest rank (6th), which shows it is the most deprived. Conversely, Central Bedfordshire is ranked 264th and Rugby is ranked 222nd of the 317 local authorities measured, depicting the low levels of deprivation in these local authorities. Furthermore, Central Bedfordshire and Rugby both have no Lower Layer Super Output Areas⁴ (LSOAs) in the most deprived 10% nationally. However, the proportion of Birmingham's LSOAs in the most deprived 10% nationally is 41%. Evidently, the level of deprivation in the study area varies between the local authorities.

Table 19-7: Deprivation in the Study Area

Local Authority	IMD Rank (Based on Average LSOA Rank)	Proportion of LSOAs in Most Deprived 10% Nationally
Birmingham	6	41.1%
North Warwickshire	155	2.6%
Nuneaton and Bedworth	101	6.2%
Coventry	81	14.4%
Rugby	222	0.0%
West Northamptonshire	N/A	N/A
Milton Keynes	172	5.3%
Buckinghamshire	N/A	N/A
Central Bedfordshire	264	0.0%
Luton	52	3.31%

[Source: ONS (2020) Indices of Multiple deprivation 2019]

² Note: data is not available for the Buckinghamshire local authority and only partially available for West Northamptonshire.

³ Data is unavailable for Buckinghamshire and West Northamptonshire as these local authorities were not created by the time of the publication of the IMD 2019 dataset.

⁴ Lower Layer Super Output Areas are a small geographical area usually comprising of between 1000 and 3000 people.

Gross Value Added (GVA)

19.5.10 **Table 19-8** showcases data from the ONS (ONS) on the gross value added (GVA) across sectors in the study area in 2021 (Ref. 29)⁵. The largest sector by GVA across the study area local authorities on average is production (sectors A-E)⁶ which accounts for 15.9% of total GVA, followed by wholesale and retail trade; repair of motor vehicles (sector G) and real estate activities (sector L) with 13.0% and 11.7% respectively. There is a widespread across many of the sectors; for example, in Coventry the production sector makes up 23.1% of total GVA, whereas in Birmingham it was only 9.2% of total GVA.

⁵ Sectors are identified by their Standard Industrial Classification (SIC) code, a classification system used to identify businesses by their type of economic activity.

⁶ Production includes Sector A agriculture, forestry and fishing; Sector B mining and quarrying; Sector C manufacturing; Sector D electricity, gas, steam and air conditioning supply; and Sector E water supply, sewerage and waste management.

Table 19-8: GVA Across the Study Area

Sector	Birmingham	North Warwickshire	Nuneaton and Bedworth	Coventry	Rugby	West Northamptonshire	Milton Keynes	Buckinghamshire	Central Bedfordshire	Luton	Average
Production sector (%)	9.2	22.7	19.9	23.1	16.3	16.5	10.0	10.6	15.2	15.2	15.9
Construction (%)	5.	10.8	5.8	2.4	10.8	8.7	3.5	9.5	8.3	6.5	7.1
Wholesale and retail trade; repair of motor vehicles (%)	10.2	18.7	12.6	9.5	8.3	11.0	21.3	15.2	12.1	11.4	13.0
Transportation and storage (%)	2.9	15.1	6.5	4.7	7.9	5.9	5.8	1.4	6.5	1.4	5.8
Accommodation and food service activities (%)	2.2	2.9	1.9	1.6	1.8	1.9	1.4	2.2	3.6	1.9	2.1
Information and communication (%)	5.7	3.1	1.5	3.3	8.8	2.1	6.0	6.5	2.5	2.9	4.2
Financial and insurance activities (%)	10.4	0.5	3.1	8.4	0.6	11.4	12.0	3.7	0.5	0.8	5.1
Real estate activities (%)	9.5	6.3	14.1	11.3	14.0	9.9	6.9	16.9	16.4	12.1	11.7
Professional, scientific and technical activities (%)	8.5	7.9	2.7	4.2	12.1	5.6	7.8	5.9	9.9	4.8	6.9
Administrative and support service activities (%)	4.1	4.9	2.9	5.4	4.6	5.5	5.9	5.4	3.7	17.8	6.0
Public administration and defence (%)	7.3	0.8	5.2	4.6	3.2	3.5	3.5	5.6	5.3	4.7	4.4
Education (%)	9.3	3.2	7.8	11.7	6.4	5.7	6.2	6.7	8.8	8.2	7.4
Human health and social work activities (%)	12.3	0.8	13.5	8.1	3.7	8.2	4.9	6.6	3.3	10.6	7.2
Arts, entertainment and recreation (%)	0.9	1.1	1.0	0.6	0.6	2.7	2.4	1.6	0.9	0.6	1.2
Other service activities (%)	1.8	1.3	1.3	1.1	1.0	1.4	2.3	1.9	2.6	0.8	1.6
Activities of households (%)	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.2	0.3	0.3	0.1

[Source: ONS (2023) GVA by Industry]

Local Receptors

19.5.11 This section of the baseline presents an overview of the types of local receptors found within the different parts of the Proposed Development. This is not an exhaustive account but does present the types of local receptors that will be included within the scope of the socio-economic assessment. Receptors that have been identified to be within or adjacent to the EIA Scoping Boundary are considered to have the potential for direct impacts associated with the Proposed Development. Receptors identified at a wider distance have the potential to be affected by indirect impacts such as severance.

19.5.12 The full network of PRoW within the study area will be established as part of the EIA, with reference to selected routes only included below. The presence of any development land along the route will also be established in the EIA through a review of planning applications and Local Plan allocations.

Part 1a: Minworth AWTP

19.5.13 The Part 1a EIA Scoping Boundary includes part of the existing Minworth Wastewater Recycling Centre (WwRC) and an area of Severn Trent owned land to the south-east known as Curdworth Beds, an area of former sewage sludge beds. There are no socio-economic receptors within the Part 1a EIA Scoping Boundary.

19.5.14 Receptors found in proximity to the EIA Scoping Boundary include residential properties, businesses (pubs and accommodation facilities), open spaces and community facilities. These are mostly located within or around the village of Curdworth. None of the land within the Part 1a EIA Scoping Boundary is in use for agricultural purposes.

Part 1b: Minworth to Atherstone Pipeline

19.5.15 Part 1b of the Proposed Development comprises a 16 km pipeline from the Minworth AWTP to an outfall on the Coventry Canal at Atherstone. The EIA Scoping Boundary lies in proximity to the villages of Lea Marston, Hurley, and Baxterley.

19.5.16 The area contains some small businesses (such as pubs/inns and a post office in Hurley), open spaces and community facilities, mostly located in or close to the villages, with residential properties found both within these and dispersed in outlying areas. Farms are located along the corridor.

19.5.17 Approaching Atherstone, Pipeline Option 1 crosses part of a golf course; Option 2 continues along Coleshill Road, a residential street with some commercial properties. The canal towpath is also within the EIA Scoping Boundary in Atherstone.

Part 2: Outfall and works to the Coventry, Oxford and Grand Union Canals

19.5.18 Part 2 of the Proposed Development comprises works to the Coventry, Oxford, and Grand Union Canals.

19.5.19 The Coventry, Oxford, and Grand Union Canals are important recreational and leisure receptors. Boating is the most popular recreational use of the canals, with moorings (leisure, residential and trade) for boaters at various

points along them including marinas. Other recreational and leisure uses encountered include angling and paddle sports such as canoeing and kayaking. The canals are also well-used for commercial purposes, with waterway businesses, chandlerys and operators offering services such as boat repairs, boat hiring, boat sales, and boating supplies. Tourism related to these activities is important along the canals.

- 19.5.20 The canals pass through rural and semi-rural areas, where residential properties and small businesses, such as pubs restaurants and hotels, are found either dispersed along the waterways or in villages. More urban areas are also encountered along the route, including towns like Nuneaton, Bletchley and Leighton Buzzard. These contain greater concentrations of housing, businesses of varying size, community facilities, including schools and hospitals, and recreational facilities, such as parks and sports grounds.
- 19.5.21 In addition to PROWs, a towpath runs in parallel along all the canal network within Part 2 of the Project, forming an important leisure and recreational route that is free to access for all users.

Part 3: Daventry and Drayton Reservoirs

- 19.5.22 Daventry Reservoir and Drayton Reservoir lie within the EIA Scoping Boundary. These resources provide opportunities for recreational activities, including fishing, boating and water sports, with adjoining open space areas. Daventry Country Park is also located within the site boundary, containing walking and nature trails.
- 19.5.23 In the town of Daventry, there are numerous residential receptors in close proximity to the EIA Scoping Boundary, as well as a variety of large and small businesses, community facilities and open spaces.
- 19.5.24 The EIA Scoping Boundary continues towards the village of Braunston where there are numerous residential receptors, as well as small businesses, and community facilities. The canal towpaths are popular recreational routes in the area and a marina lies in proximity to the EIA Scoping Boundary.

Part 4a: Abstraction, Storage and Treatment

- 19.5.25 The EIA Scoping Boundary includes two site options for abstraction, storage and treatment, both of which are located within the administrative boundary of Buckinghamshire Council.
- 19.5.26 Site B lies south of Milton Keynes near Bletchley. Most of the business and community receptors in proximity to Site B are located in the town of Bletchley and in Milton Keynes, with some such receptors also found at outlying semi-rural locations close to the Site.
- 19.5.27 Site H lies south of Leighton Buzzard near the village of Slapton. Residential receptors within proximity to the Site are found predominantly in the village of Slapton, concentrated around Horton Road and Church Road. Small businesses and community facilities are dispersed in the area.

Part 4b: Pipeline to an Underground Reservoir near Luton

- 19.5.28 A number of pipeline route options remain within the EIA Scoping Boundary from Sites B and H to the existing underground reservoir near Luton. Site B

would require the implementation of pipeline route option SP2. Site H would require the implementation of either SP5 or a combination of SP6 and SP7. Pipeline route option SP10 would be implemented regardless of which abstraction, storage and treatment site is selected. An overview of receptors within the 200m EIA Scoping Boundary corridor of each of the route options is set out as follows:

- a. SP2: Residential receptors are dispersed along the corridor, such as in Little Brickhill, as well as in Sandhouse Close. A few small businesses and community facilities are also present;
- b. SP5: Residential properties here are mostly located on Horton Road, Tring Road and on South End Lane along the corridor, and there are a number of businesses at Icknield Way farm;
- c. SP6 and SP7: Residential properties are to be found on Totternhoe Road, with limited business activity and presence of community and recreational facilities, close to Slapton; and
- d. SP10: Residential properties here are to be found on Totternhoe Road, School Lane in Eaton Bray, Isle of Wight Lane, Farmers Lane. Woodpecker Edge and in Church End, with a presence of community and recreational facilities nearby.

Future Baseline

19.5.29 The ONS provides data on population projections at local authority level⁷ (Ref. 30). Anticipated population change in the study area is shown in **Table 19-9**. The average projected population growth across the local authorities between 2021 and 2040 is 8.5%, higher than the average across England (7.3%). Of the local authorities, Coventry has the highest projected population growth (17.0%), followed by North Warwickshire (15.6%). Populations are expected to increase in all local authorities.

19.5.30 With regard to the local economy, it would be reasonable to expect that employment and GVA would increase across the study area, associated with the expected increase in population. It is expected that PRoW will continue to be used. Businesses and community facilities may open and close. These changes are not considered to constitute significant changes to baseline. It is not expected that there will be any perceptible changes to the local economic baseline assessment and the Proposed Development should be assessed against current baseline conditions and policies.

Table 19-9: Population Projections

Geography	2021	2040	Percentage Change (%)
Birmingham	1,157,300	1,238,600	7.0%
North Warwickshire	67,200	77,700	15.6%
Nuneaton and Bedworth	131,200	145,800	11.1%

⁷ Data is unavailable for the local authority of West Northamptonshire as the dataset uses local authorities as of 2019; West Northamptonshire was created in 2021. Therefore, it has been excluded.

Geography	2021	2040	Percentage Change (%)
Coventry	383,800	449,000	17.0%
Rugby	110,700	124,300	12.3%
Milton Keynes	272,500	282,100	3.5%
Buckinghamshire	548,900	575,000	4.8%
Central Bedfordshire	293,000	324,100	10.6%
Local Authority Average	370,600	402,100	8.5%
England	56,989,600	61,157,900	7.3%

[Source: ONS (2018) Population Projections]

19.6 Potential Effects

Construction Phase

19.6.1 The scoping of potential effects from the Proposed Development during the construction phase is presented within **Table 19-10** below.

Table 19-10: Potential effects during the construction phase – Socio-economics

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Temporary direct and indirect employment generation	In	All	The Proposed Development could create direct and indirect jobs in terms of employment and supply chain opportunities, as well as safeguarding jobs in existing areas of supply chains during the construction phase.
GVA generation	In	All	The Proposed Development could create GVA during construction which could positively impact on the economy.
Promotion/ provision of training and apprenticeship opportunities	In	All	The Proposed Development may offer temporary training and upskilling opportunities such as apprenticeships.
Impacts on local and private assets (including residential properties, local businesses, community facilities, open space/recreation and visitor attractions) via	In	All	The Proposed Development may result in disruption / reduced access to assets as well as impacts upon the amenity of these assets.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
direct works or indirect via in combination effects identified by other discipline assessments			
Impacts on agricultural land holdings	In	Parts 1b, 4a and 4b	The EIA Scoping Boundary of Parts 1a, 2 and 3 do not contain agricultural land holdings. The restriction to agricultural function from permanent and temporary use of farmland (Parts 1b, 4a and 4b) is a potential socio-economic impact. As such, the effects are scoped into the assessment.
Impacts on the use of the canal network as a recreational and leisure resource via direct works or indirect via in combination effects identified by other discipline assessments	In	Parts 2 and 3	The Proposed Development may result in temporary disruption / reduced access to the canal network as well as impacts upon the amenity of the canal network for recreational and leisure users.
	Out	Parts 1a, 1b, 4a and 4b	The Proposed Development would not result in temporary disruption / reduced access to the canal network for recreation and leisure users in these Parts.
Impacts on the use of the canal network for commercial uses via direct works or indirect via in combination effects identified by other discipline assessments	In	Parts 2 and 3	The Proposed Development may result in temporary disruption / reduced access to the canal network.
	Out	Parts 1a, 1b, 4a and 4b	The Proposed Development would not result in temporary disruption / reduced access to the canal network for commercial users in these Parts.
Land use impacts on planned and proposed developments	In	All	The Proposed Development may impact ongoing development activity and take up or impact access to development land.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Temporary disruption to PRow and canal towpath access	In	All	The Proposed Development may result in temporary disruption / reduced access to PRow and canal towpaths for users through diversions and temporary closures during construction.
Impacts on temporary accommodation facilities	In	All	The peak daily construction workforce may put temporary demand pressure / impact upon the hotels, bed and breakfast temporary accommodation sector.
Impacts on the tourism sector	In	Parts 2 and 3	The assessment will consider the potential for temporary likely significant effects on canal-based tourism, accounting for the assessments of effects on businesses, recreational and leisure users, visitor attractions and accommodation facilities through which tourism is associated and wider catalytic impacts to assess the overall effect on the sector as a whole.
	Out	Parts 1a, 1b, 4a and 4b	There is no canal-based tourism activity which could be impacted by the Proposed Development.

Operational Phase

19.6.2 The scoping of potential effects from the Proposed Development during the operational phase is presented within **Table 19-11** below.

Table 19-11: Potential effects during the operational phase – socio-economics

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Permanent direct and indirect employment generation	Out	All	While the Proposed Development is likely to generate beneficial employment impacts, these are not likely to be significant.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
GVA generation	Out	All	Due to the likely low levels of operational employment, GVA generation would be minimal during operation and not likely to be significant.
Promotion/ provision of training and apprenticeship opportunities	Out	All	While the Proposed Development is likely to generate beneficial impacts in terms of training and apprenticeship provision, these are not likely to be significant.
Impacts on local and private assets (including residential properties, local businesses, community facilities, open space and visitor attractions), either via direct works or indirect via in combination effects identified by other discipline assessments	Out	All	Effects on local and private assets are not likely beyond the construction phase, as activities associated with the operation of the Proposed Development such as maintenance will be minimal and unlikely to cause significant effects on local and private assets.
Impacts on the use of the canal network as a recreational and leisure resource directly through operation via direct works or indirectly via in combination effects identified by other discipline assessments	In	Parts 2 and 3	The Proposed Development may result in changes to the ability of recreational and leisure users to use the canal network.
	Out	Parts 1a, 1b, 4a and 4b	The Proposed Development would not result in changes to the ability of recreational and leisure users to use the canal network in these sections.
Impacts on the use of the canal network for commercial uses via direct works or indirect via in combination effects identified by other discipline assessments	In	Parts 2 and 3	The Proposed Development may result in changes to the ability of commercial users to use the canal network.
	Out	Parts 1a, 1b, 4a and 4b	The Proposed Development would not result in changes to the ability of commercial users to use the canal network in these sections.
Permanent disruption to PRoW	Out	All	Impacts on PRoW (including any permanent impacts) are

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
and canal towpath access			likely to occur during construction and would be assessed as construction phase effects. Any effects on PROW and canal towpath arising from maintenance activities would be minimal and not likely to be significant.
Impacts on accommodation facilities	Out	All	The operation of the Proposed Development is not likely to require a large workforce, and therefore any effects on accommodation facilities, are likely to be minimal.
Impacts on the tourism sector	In	Parts 2 and 3	The assessment will consider the potential for likely significant effects on canal-based tourism, accounting for the assessments of effects on businesses and recreational and leisure users through which tourism is associated and wider catalytic impacts to assess the overall effect on the sector as a whole.
	Out	Parts 1a, 1b, 4a and 4b	There is no canal-based tourism activity which could be impacted by the Proposed Development for these Parts of the Proposed Development.
Land use impacts on planned and proposed developments	Out	All	Land use impacts on planned and proposed developments are unlikely during operation as operational activities such as maintenance are likely to be minimal and no land take is expected, therefore effects are not likely to be significant.

19.7 Approach to Assessment

Establishing Baseline Conditions

- 19.7.1 Baseline data illustrating the existing socio-economic conditions within and surrounding the EIA Scoping Boundary, including employment and the economy, will be collected through a desk-based research using publicly available sources, documents, and web-based applications. Data sources may include ONS and the Ministry of Housing, Communities and Local Government (MHCLG) (Ref. 31). Baseline data in relation to Part 2 and 3 of

the project in relation to existing towpath usage and lockage data will be used to inform the baseline further into the ES.

Assessment Methodology

- 19.7.2 An assessment of potential impacts will be undertaken to determine the effect of the Proposed Development on the baseline socio-economic conditions. The methodology for assessing socio-economic impacts will follow standard EIA guidance and will entail:
- a. An assessment of the likely scale, permanence and significance of effects associated with socio-economics; and
 - b. An assessment of the potential cumulative impacts with other schemes within the surrounding area.
- 19.7.3 The assessment will be carried out using a number of recognised data sources, and wherever possible the impacts of the socio-economic assessment will be appraised against relevant national standards such as those provided in the HM Treasury Green Book (Ref. 25).
- 19.7.4 The assessment of impacts on agricultural land holdings will be carried out in line with DMRB LA112 guidance (Ref. 32).
- 19.7.5 Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

Assessment Criteria

- 19.7.6 The assessment of potential socio-economic impacts will use policy thresholds and expert judgment to assess the scale and nature of the impacts of the Proposed Development against baseline conditions. For socio-economics, there is no accepted definition of what constitutes a significant (or not significant) socio-economic effect. It is however recognised that effects are categorised based upon the relationship between the scale (or magnitude) of effect and the sensitivity (or value) of the affected resource or receptor.
- 19.7.7 As such, the socio-economic effects will be assessed on the basis of:
- a. Consideration of sensitivity to impact: specific values in terms of sensitivity are not attributed to socio-economic resources/receptors due to their diverse nature and scale, however the assessment takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor and, in particular, their ability to respond to change based on recent rates of change and turnover (if appropriate); and
 - b. Scale of impact: this entails consideration of the size of the impact on people or business in the context of the area in which effects will be experienced.
- 19.7.8 The assessment aims to be objective and quantify effects as far as possible. However, some effects can only be evaluated on a qualitative basis. Effects are defined as follows:
- a. Beneficial classifications of effect: indicate an advantageous or beneficial effect on an area, which may be minor, moderate, or major in effect;

- b. Negligible classifications of effect: indicate imperceptible effects on an area;
- c. Adverse classifications of effect: indicate a disadvantageous or adverse effect on an area, which may be minor, moderate or major in effect; and
- d. No effect classifications: indicate that there are no effects on an area.

19.7.9 Based on consideration of the above, where an effect is assessed as being beneficial or adverse, the scale of the effect will be assigned using the below criteria. This classification of effects and those which are significant follows the approach set out in the significance matrix in **Chapter 6: EIA Approach**:

- a. Minor: a small number of receptors are beneficially or adversely affected. The effect will make a small measurable positive or negative difference on receptors at the relevant area(s) of effect;
- b. Moderate: a noticeable number of receptors are beneficially or adversely affected. The effect will make a measurable positive or negative difference on receptors at the relevant area(s) of effect; and
- c. Major: all or a large number of receptors are beneficially or adversely affected. The effect will make a measurable positive or negative difference on receptors at the relevant area(s) of effect.

19.7.10 Those effects which are found to be moderate or major will be considered to be 'significant' and those which are minor or negligible are 'not significant'.

19.7.11 Duration of impact is also considered, with more weight given to reversible long-term or permanent changes than to temporary ones. Temporary impacts are considered to be those associated with the construction works. Long-term reversible impacts are generally those associated with the completed and operational development. For the purposes of the socio-economic assessment, short term impacts will be considered to be of one year or less, medium term impacts of one to four years and long-term impacts for five or more years.

Economic Impacts

19.7.12 **Table 19-12** sets out more specific details on the quantitative economic impact assessment methodology, which will be applied to the assessment of construction impacts, and indirectly to the assessment of GVA. Additionality factors have been informed by the Homes and Communities Agency (HCA) Additionality Guidance (Ref. 24).

Table 19-12: Additionality Factors

Additionality Factor	Explanation
Leakage (% of jobs that benefit those residents outside the Proposed Development's identified target area)	Relating to employment from outside the target area – this is the proportion of jobs taken by people who live outside of the principle labour catchment area.
Displacement (% of jobs that account for a reduction in related jobs in the Proposed	Displacement relates to jobs that wouldn't occur elsewhere due to the Proposed Development, for example construction workers being unavailable for other projects.

Additionality Factor	Explanation
Development's identified target areas)	
Multiplier (further economic activity associated with the additional local income/expenditure, supplier purchase and longer-term development effects)	The multiplier is a composite figure which takes into account both the indirect jobs created across the study area based on supply chain activity but also the induced employment created through increased spending across the study area. The HCA Additionality Guidance provides a 'ready reckoner' of composite multipliers.

Agricultural Land Holdings

19.7.13 For effects on agricultural land holdings, the significance of effects will be derived by combining the assigned value (sensitivity) of receptors with the magnitude of change, in accordance with DMRB LA 112.

19.7.14 The sensitivity of agricultural land holding receptors will be reported in accordance with the criteria outlined in Table 3.11 of DMRB LA 112 and shown below in **Table 19-13**. Receptors will be assigned a value for sensitivity based on professional judgement, taking into consideration the reliance of enterprises on the receptors and frequency of use (daily, weekly, monthly, etc). The sensitivity of agricultural land holding receptors is then assigned a sensitivity value of: Very high, High, Medium, Low and Negligible.

Table 19-13: Sensitivity of agricultural land holding receptors

Receptor value (sensitivity)	Description
Very high	• Areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on a frequent basis (daily).
High	• Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on a frequent basis (weekly).
Medium	• Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly).
Low	• Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent).

Receptor value (sensitivity)	Description
Negligible	• Areas of land which are infrequently used on a non-commercial basis.

19.7.15 Similarly, the magnitude of impacts upon agricultural land holding receptors will be reported in accordance with the criteria outlined in Table 3.12 of DMRB LA 112, presented in **Table 19-14**. The magnitude of impact criteria outlined in DMRB LA 112, categorise impacts as the following: Major, Moderate, Minor, Negligible and No Change.

Table 19-14: Magnitude of impact and typical descriptions

Magnitude of impact (change)	Typical description
Major	• Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. e.g. direct acquisition and demolition of buildings and direct development of land; and/or • Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision.
Moderate	• Partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of agricultural holdings; and/or • Introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision.
Minor	• A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g., amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of agricultural holdings; and/or • Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision.
Negligible	• Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. e.g. direct acquisition and demolition of buildings and direct development of land; and/or • Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision.
No change	• No loss or alteration of characteristics, features, elements or accessibility; no observable impact on either direction.

19.7.16 The significance of agricultural land holdings effects will be derived by combining the sensitivity of the receptor with the magnitude of the impact.

19.8 Assumptions, Limitations, and Uncertainties

19.8.1 The baseline conditions analysis will be carried out against a benchmark of current socio-economic baseline conditions prevailing around the Proposed

Development, as far as is possible within the limitations of individual datasets. Baseline data will be subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.

19.9 Approach to Mitigation

- 19.9.1 Mitigation and measures for the construction and operational phases (some of which may have already been considered through the early development of the proposals, such as avoiding local receptors through route options) will be considered during the assessment. Additional mitigation will be developed, where required, as the design is progressed and will be included in the Environmental Statement (ES), as appropriate. Where significant adverse effects are found, additional mitigation will be provided.
- 19.9.2 Mitigation measures set out in **Chapter 9: Air Quality and Odour, Chapter 16: Landscape and Visual Amenity, Chapter 18: Noise and Vibration and Chapter 20: Traffic and Transport** are also likely to be relevant for minimising effects on local receptors associated with socio-economics.
- 19.9.3 Mitigation for minimising construction disturbance, where this is necessary to minimise impacts, will be set out within a Code of Construction Practice and Outline Construction Traffic Management Plan to be submitted with the DCO application. In addition to mitigation, an Outline Skills, Supply Chain and Employment Plan will be developed for submission with the DCO application to maximise the benefits of the Proposed Development across the host authorities.

19.10 References

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- Ref. 5 Birmingham City Council (2022) New Local Plan for Birmingham. Available at:

- https://www.birmingham.gov.uk/info/20008/planning_and_development/2477/new_local_plan_for_birmingham [Accessed 21/03/2025].
- Ref. 6 North Warwickshire (2021) Local Plan for North Warwickshire. Available at: <https://www.northwarks.gov.uk/forward-planning/local-plan-north-warwickshire> [Accessed 21/03/2025].
- Ref. 7 Warwickshire County Council (2024). Economic Growth Strategy for Warwickshire 2024-2034. Available at: <https://democracy.warwickshire.gov.uk/mgConvert2PDF.aspx?ID=36401> [Accessed 21/03/2025].
- Ref. 8 Nuneaton and Bedworth Borough Council (2019) Adopted Borough Plan (2011-2031). Available at: <https://www.nuneatonandbedworth.gov.uk/adopted-borough-plan/borough-plan-1/2> [Accessed 21/03/2025].
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- Ref. 10 Coventry City Council (2017) Coventry Local Plan 2011-2031. Available at: <https://www.coventry.gov.uk/planning-policy/coventry-local-plan-2011-2031> [Accessed 21/03/2025].
- Ref. 11 Coventry City Council (2023) Coventry Local Plan Review Issues and Options Consultation. Available at: <https://coventrycitycouncil.inconsult.uk/CLPRIO/consultationHome> [Accessed 21/03/2025].
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Chapter 20: Traffic and Transport

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20. Traffic and Transport

20.1 Introduction

20.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on traffic and transport.

20.1.2 Potential impacts relating to the rivers, canals and its associated users are considered under **Chapter 17: Major Accidents and Disasters** (including navigation risks and breach/failure of canal infrastructure), **Chapter 18: Noise and Vibration** (with regards to traffic noise) and **Chapter 19: Socio-economics** (with regards to leisure and recreational users of the canal).

20.1.3 This chapter is supported by:

- a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 20-1: Part 1a Roads Affected by the Proposed Development;**
 - ii. **Figure 20-2: Part 1b Roads Affected by the Proposed Development;**
 - iii. **Figure 20-3: Part 2 Roads Affected by the Proposed Development;**
 - iv. **Figure 20-4: Part 3 Roads Affected by the Proposed Development;**
 - v. **Figure 20-5: Part 4a Roads Affected by the Proposed Development;**
 - vi. **Figure 20-6: Part 4b Roads Affected by the Proposed Development;**
 - vii. **Figure 20-7: Part 1a Public Rights of Ways Affected by the Proposed Development;**
 - viii. **Figure 20-8: Part 1b Public Rights of Ways Affected by the Proposed Development;**
 - ix. **Figure 20-9: Part 2 Public Rights of Ways Affected by the Proposed Development;**
 - x. **Figure 20-10: Part 3 Public Rights of Ways Affected by the Proposed Development;**
 - xi. **Figure 20-11: Part 4a Public Rights of Ways Affected by the Proposed Development; and**
 - xii. **Figure 20-12: Part 4b Public Rights of Ways Affected by the Proposed Development.**
- b. The following appendices in Volume 3 of this EIA Scoping Report:
 - i. **Appendix 20-1: Road Links Affected by the Proposed Development; and**
 - ii. **Appendix 20-2: Public Rights of Way Affected by the Proposed Development.**

20.1.4 The scope of the traffic and transport assessment covers the potential environmental impacts to sensitive receptors during the construction and operational phases of the Proposed Development. This includes the following assessment criteria:

- a. Severance of communities;
- b. Road vehicle driver and passenger delay;
- c. Non-motorised user delay;
- d. Non-motorised amenity;
- e. Fear and intimidation on and by road users;
- f. Road user and pedestrian safety; and
- g. Hazardous/large loads.

20.1.5 A separate Transport Assessment (TA) will be undertaken that will assess the traffic impacts of the Proposed Development on the surrounding highway network including roads, junction and Public Rights of Way (PRoW), avoiding restricted bridges and bridges subject to weight limits. The TA report will either be appended to the ES (and PEIR) or submitted as a stand-alone document with the DCO application.

20.2 Legislation, Planning Policy Context, and Guidance

Legislation

20.2.1 There is no specific legislation relevant to the assessment of traffic and transport.

National Policies, Plans and Strategies

20.2.2 The relevant national policies, plans and strategies for traffic and transport are summarised within **Table 20-1** below. These documents have informed the assessment methodology, identification of sensitive receptors and study area.

Table 20-1: National policies, plans and strategies – Traffic and Transport

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (2023) (Ref. 1)	• Paragraph 4.14.5 – Applicant’s Assessment; • Paragraph 4.14.8; • Paragraph 4.14.9; and • Paragraph 4.14.21.	Paragraph 4.14.5 outlines that if a development is likely to generate significant transport implications, the ES should include a transport appraisal. Paragraph 4.14.8 outlines that the assessment should consider disruption to services and infrastructure (such as road, rail and airports). Paragraph 4.14.9 outlines that any additional transport infrastructure <i>“should always include good quality walking, wheeling and cycle routes.”</i> Paragraph 4.14.21 outlines that development consent should not be withheld provided that the applicant is willing to enter into planning obligations for funding new infrastructure or requirements can be imposed to mitigate the transport impacts.
National Planning Policy Framework (NPPF) (2024) (Ref. 2)	• Promoting sustainable transport: Section 9, paragraph 117.	This policy states that developments should: • <i>“Give priority to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second -so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use.</i> • <i>Address the needs of people with disabilities and reduced mobility in relation to all modes of transport.</i> • <i>Create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards; and</i>

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
		• <i>Allow for the efficient delivery of goods, and access by services and emergency vehicles."</i>
Planning Practice Guidance 'Travel Plans, Transport Assessments and Statements in Decision-Taking' (2014) (Ref. 3)	• Paragraph 002 – What are Travel Plans, Transport Assessments and Statements? • Paragraph 004 – What are Transport Assessments and Statements? • Paragraph 005 – How do Travel Plans, Transport Assessments and Statements relate to each other? • Paragraph 006 – Why are Travel Plans, Transport Assessments and Transport Statements important? • Paragraph 007 – What key principles should be taken into account in preparing a Travel Plans, Transport Assessments or Transport Statements? • Paragraph 013-015 – When are Transport Assessments and Transport Statements required?	Paragraph 002 outlines that Travel Plans (TP), TA and Transport Statements (TS), "...are all ways of assessing and mitigating the negative transport impacts of development in order to promote sustainable development. They are required for all developments which generate significant amounts of movements". Paragraphs 004 and 005 outlines that TA should evaluate the potential transport impacts of a development proposal and may propose mitigation measures to promote sustainable development to avoid unacceptable or "severe" impacts where necessary. Paragraph 006 outlines that TA support National Planning Policy and can positively contribute to encouraging sustainable travel, reducing traffic generation and detrimental impacts, reducing carbon emissions and climate impacts, creating accessible, connected, and inclusive communities, improving health outcomes and quality of life, improving road safety and reducing the need for new development to increase existing road capacity of provide new roads. Paragraph 007 outlines that TA should be established at an early stage and be tailored to local circumstances and proportionate to the size and scope of the proposed development. In addition, they should be brought forward through collaborative ongoing working between the local planning authority/ transport authority, transport operators, rail network operators, as well as National Highways where there

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
		may be implications for the strategic road network and other relevant bodies. Paragraph 13 outlines when a TA and TS will be required. Paragraph 014 states “...<i>the need for, scale, scope and level of detail required of a Transport Assessment or Statement should be established as early in the development management process as possible</i>”. Paragraph 015 outlines the requirements of what information should be included within a TA and TS.

Local Policy

- 20.2.3 The local policies listed in **Table 20-2** are considered relevant to the scope and method of assessment of traffic and transport impacts presented in this chapter.

Table 20-2: List of relevant local policy – Traffic and Transport

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council (BCC)	Adopted Birmingham Development Plan 2011-2031: • Policy TP38 A sustainable transport network; • Policy TP39 Walking; • Policy TP40 Cycling; • Policy TP41 Public Transport; and • Policy TP44 Traffic and congestion management.	Ref. 4	Policy TP38 states that the BCC will support a “...sustainable, high quality, integrated transport system, where the most sustainable mode choices also offer the most convenient means of travel”. Policy TP39 states that the “...provision of safe and pleasant walking environments throughout Birmingham will be promoted”. Policy TP40 states that “...comprehensive city-wide programme of cycling infrastructure improvements (both routes and trip end facilities)” will be encouraged. This will be “...supported by a programme of cycling promotion, accessible cycling opportunities, training and travel behavioural change initiatives”. Policy TP41 focuses on the improvement of public transport facilities (including interchanges). Policy TP44 focuses on traffic and congestion management across Birmingham and seeks to optimise the use of existing highway infrastructure for all modes of transport.
	New Local Plan for Birmingham 2042.	Ref. 5	The New Local Plan is still at consultation stage at the time of writing of this report.
Warwickshire County Council (WCC)	Local Plan 2011-2029: • Policy TR1 Access and Choice; • Policy TR2 Traffic Generation; and • Policy TR4 Safeguarding for Transport Infrastructure.	Ref. 6	Policy TR1 states that “...development will only be permitted that provides safe, suitable and attractive routes for pedestrians, cyclists, public transport users, emergency vehicles, delivery vehicles, refuse vehicles and other users of motor vehicles, as appropriate”. Policy TR2 states that “...all large-scale developments (both residential and non-residential) that result in the generation of significant traffic movements should be supported by a

Local authority	Relevant local policy	Reference	Relevance to the assessment
			<i>TA and where necessary a TP, to demonstrate the practical and effective measures to be taken to avoid the adverse impacts on traffic. Any development that results in significant negative impacts on the health and wellbeing of people in the area as a result of pollution, noise or vibration caused by traffic generation will not be permitted unless effective mitigation can be achieved”.</i> Policy TR4 outlines that development will not be permitted if it could inhibit the delivery of infrastructure such as High Speed Rail 2 (HS2) and areas of search for Park and Ride facilities.
	WCC Local Transport Plan 4: • Policy KP1 – Engaging with communities; • Policy KP2 – Transport intervention that are aligned with local and national policy and promote key strategy themes; and • Policy KP3 – Decarbonising transport and transport related infrastructure.	Ref. 7	Policy KP1 outlines that local communities will be engaged with, so that a sustainable transport network can be developed. Policy KP2 states that “...all policies and interventions will deliver benefits for the environment, wellbeing, place and/or economy”. Policy KP3 states that “...car dependency will be discouraged where suitable in favour of more sustainable travel choices”.
	Warwickshire Sustainable Future Strategy (2023): • Transport; and • Sustainable Communities and Green Economy.	Ref. 8	For Transport the ambition of the policy is to have net-zero surface transport. This will be achieved by increasing the use of sustainable transport modes and encouraging active travel. For Sustainable Communities and Green Economy, the ambition of the policy is to ensure people have the skills and access to jobs within the green economy where all the

Local authority	Relevant local policy	Reference	Relevance to the assessment
			industries contribute to sustainable, equitable and healthy communities.
	WCC Council Plan: • Delivery major infrastructure, digital connectivity and improved transport options; and • Tackle climate change, promote biodiversity and deliver on Net-zero commitments.	Ref. 9	Delivering on the new Local Transport Plan, enhancing the network to support health, well-being and sustainability. The plan will prioritise active travel, implementing electric vehicle (EV) technology and a refreshed public transport options. Embedding plans to develop a sustainable economy by promoting sustainable transport systems.
	Warwickshire Council Delivery Plan 2024-2026 (2024): • An infrastructure with connectivity that supports new investment and enables local businesses to reach their full potential; and • Support to businesses in the transition to net zero.	Ref. 10	It states: <i>“Create a more accessible, inclusive communities and workplaces which have sustainable transport and digital connectivity, to help people access employment opportunities”</i> . Encourage residents to make active travel choices and businesses to move to sustainable freight. Support the infrastructure of EV charging and alternative fuels to meet the transport need in the country. Encourage businesses to prioritise sustainable transportation modes such as public transport, cycling, walking, carpooling, ridesharing and telecommuting.
	Warwickshire Waterways Strategy (2021)	Ref. 11	The aims of the document are to promote and protect the country’s waterways as a rich habitat for wildlife and a desirable setting for residents, visitors and businesses and to connect people and places via the waterways network. The strategy is shaped around three main themes reflecting current priorities are health and wellbeing, sense of place and economic vibrancy. The ambitions and aims of the water ways strategy are set out below:

Local authority	Relevant local policy	Reference	Relevance to the assessment
			• Improve public health and wellbeing. • Increase sense of place. • Promote water network as a tourist attraction and growth generator for the visitor economy. • Promote and protect the waterways as green spaces and wildlife habitats. Present and promote the waterways as sustainable transport routes for walking and cycling.
North Warwickshire Borough Council (part of Warwickshire County)	Local Plan for North Warwickshire 2021-2033: • Policy LP23 Transport Assessments & Travel Plan; • Policy LP25 Railway Lines; • Policy LP26 Strategic Road Improvements; • Policy LP27 Walking and Cycling; and • Policy LP28 Level Crossings.	Ref. 12	Policy LP23 outlines that a “<i>TA appropriate to the scale of the development proposed will be required to accompany development proposals</i>”. It further states that “<i>An assessment will be required where there is a cumulative effect created by additional floor space or traffic movement on the site or in the vicinity, or where there are demonstratable shortcomings in the adequacy of the local transport network to accommodate development of the scale proposed</i>”. A TP will also be required to be submitted alongside a TA. Policy LP25 outlines that the HS2 lines in Phases 1 and 2B through the borough will be safeguarded. The former Baddesley Mineral Railway Line and the Whitacre Line (Route RR2) will be safeguarded to allow for the potential reinstatement of the route, or to be used as a recreational cycle route. Furthermore, the policy states that, “<i>no development will be permitted which would sever or prevent the future use of these routes, unless a suitable diversion or alternative can be provided</i>”. Policy LP26 outlines the Councils plans for strategic road improvements on the A5 and the A446. A study has been

Local authority	Relevant local policy	Reference	Relevance to the assessment
			undertaken on the A5 Trunk Road and the outcome will become a material planning consideration for future development proposals that might impact on the A5. The policy states that <i>“Land located within Site RH1 will be protected from any development to ensure the dualling of the A5 can take place”</i>. When the dualling is complete Watling Street will be downgraded. Walking and cycling infrastructure will be actively encouraged and promoted on this route. The policy will also ensure that <i>“Improvements on the A446 including the dualling over the River Tame will be sought as well as improved cycling links”</i>. Policy LP27 states that <i>“The Borough Council will develop a walking and cycling strategy”</i>. As such, <i>“...all developments should consider what improvements can be made to encourage safe and fully accessible walking and cycling routes”</i>. Policy LP28 states <i>“...that contributions will be sought where proposals will impact level crossings to mitigate the impacts of those developments. Wherever possible level crossings will be closed, and either replaced with a footbridge or by a diversionary route”</i>.
Nuneaton and Bedworth Borough Council (part of Warwickshire County)	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: • Policy HS2 – Strategic accessibility and sustainable transport.	Ref. 13	Policy HS2 states that <i>“...developments which are likely to have transport implications, planning applications must address the following issues.</i> • <i>How the development ensures adequate accessibility in relation to all principal modes of transport.</i> • <i>Whether the development identifies suitable demand management measures.</i> • <i>The impact on air quality and measures proposed to ensure impact is not exacerbated. The council will</i>

Local authority	Relevant local policy	Reference	Relevance to the assessment
			<i>support measures such as the provision and integration of infrastructure which may help to deal with the issues of air quality, such as electric vehicle charging points.</i> <i>• The connectivity of the development to strategic facilities.</i> <i>• How the development delivers sustainable transport options in a safe way that link to the wider transport network.</i> <i>• Whether the proposal will meet acceptable levels of impact on existing highways networks and the mitigation measures required to meet this acceptable level.</i> <i>Proposals should target a 15% modal shift to non-car-based uses by including provisions which promote more sustainable transport options”.</i>
	Borough Plan Review 2021-2039.	Ref. 14	Borough Plan Review 2021-2039 is set for adoption in December 2024. The Issues and Options Review outlines that the supporting text to Policy SA1 should refer to footpaths and cycleways and that opportunities for these should be pursued as part of the development of a strategic site.
Coventry City Council	Coventry Local Plan (2011-2031): • Policy AC1: Accessible Transport Network; • Policy AC2: Road Network; • Policy AC3: Demand Management; • Policy AC4: Walking and Cycling; and	Ref. 15	Policy AC1 states that “...<i>development proposals that generate additional trips should:</i> <i>• Integrate with existing transport networks including roads, public transport and walking and cycling routes to promote access by a choice of transport modes.</i> <i>• Consider the transport and accessibility needs of everyone living in, working in or visiting the city; and</i> <i>• Support the delivery of new and improved high quality local transport networks”.</i>

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Policy AC5: Bus and Rapid Transit.		Policy AC2 outlines that new development proposals which are predicted to have a negative impact on the highway network should: - Mitigate and manage the anticipated traffic growth, by either promoting sustainable modes of transport or the delivery of highway capacity interventions. Where this is not achievable, proposals will only be considered acceptable if appropriate interventions can be applied; and - Seek to support and accommodate (where appropriate), measures which facilitate enhancements to the wider transport network. Policy AC3 states that “...a TA is required for developments which generate significant additional trips on the transport network”. It also outlines that a TP will also be required for new developments which generate significant additional trips. Policy AC4 states that “...development proposals should incorporate appropriate safe and convenient access to walking and cycling routes. Where the links do not exist, new and upgraded routes will be required and these must appropriately link into established networks to ensure routes are continuous”. The policy outlines that for larger developments a financial contribution may be required. Policy AC5 outlines that new major developments will provide access to the existing bus network, where this is not possible a new service may be required.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Local Plan Review: Issues and Options Consultation (2023): • Policy AC1 – Accessible transport Network; • Policy AC2 – Road Network; • Policy AC3 – Demand Management; • Policy AC4 – Walking and Cycling; and • Policy AC5 – Bus and Rapid Transit.	Ref. 16	Policy AC2 sets out how Coventry City Council can secure contributions and the provision of transport infrastructure, such as through S106 agreements. It is also recommended to remove specific reference to the Community Infrastructure Levy (CIL) in Policy AC2 given the Council's viability exercise has determined that CIL will not be introduced into the city in the foreseeable future. It is proposed that a more generic reference to 'developer contributions' may be appropriate given that the government has stated its intention to introduce a new 'Infrastructure Levy', further details on this area waited at the time of writing. Policy AC4 is recommended to be updated in relation to Quiet Streets to reflect the Council's plans to deliver a wider range of walking and cycling schemes, including high quality, segregated cycleways on key corridors, Liveable Neighbourhoods and School Streets. It is suggested that Policy AC5 - the development of a rapid transit network – be updated to reflect the latest plans for the Very Light Rail system.
Rugby Borough Council (part of Warwickshire County)	Rugby Borough Local Plan 2011-2031: • Policy HS5: Traffic Generation and Air Quality, Noise and Vibration; • Policy D1: Transport; and • Policy D3: Infrastructure and Implementation.	Ref. 17	Policy HS5 outlines that development proposals should promote a shift to sustainable transport modes and low emission vehicles. Development proposals should consider the cumulative impacts of all development including those proposed in the Local Plan on traffic generation, noise and vibration. Policy D1 states that “...<i>development will be permitted where sustainable modes of transport are prioritised, and measures designed to mitigate transport impacts arising from either individual development proposals or cumulative</i>

Local authority	Relevant local policy	Reference	Relevance to the assessment
			<i>impacts caused by a number of proposals are provided".</i> The policy further outlines that a TA will be expected to be submitted alongside applications for large scale proposals. For small scale developments a TS will be required. Policy D3 states that <i>"...the delivery of new developments will be dependent on sufficient capacity being available in existing infrastructure and/or mitigation measures being proposed to mitigate its impact. Where this cannot be demonstrated permission for new development will only be granted where additional capacity can be released through new infrastructure, or better management of existing infrastructure.</i> <i>Developer contributions may be sought to fund new infrastructure when required to mitigate the development impacts".</i>
	Rugby Borough Local Plan review – issues and options consultation (2023):	Ref. 18	The review of the Rugby Borough Local Plan is still at the consultation stage at the time of writing of this report.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: • Policy C1 – Changing Behaviour and Achieving Modal Shift; • Policy C2 – New Developments; • Policy C3 – Strategic Connections; • Policy C4 – Connecting Urban Areas;	Ref. 19	Policy C1 states that <i>"...priority will be given to proposals that;</i> • <i>provide access by walking, cycling and public transport to key facilities and services;</i> • <i>promoting the use of walking, cycling and public transport over and above private car trips;</i> • <i>Maximising the use of existing capacity within the transport infrastructure and managing the demand for car-based travel within urban areas; and</i> • <i>Managing the demand for car-based travel within urban areas".</i>

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy C5 – Enhancing Local and Neighbourhood Connections; and - Policy C6 – High Speed Rail 2.		Policy C2 outlines that new developments will be expected to achieve the modal shift targets by maximising travel choice from non-car modes. Furthermore, Development will be required to mitigate its effects on the highway network and be supported by a TA and TP. Policy C3 outlines the aim to retain and enhance West Northamptonshire’s strategic connections for economic advantage. The policy outlines that support will be given to proposals that make use of the Canal Network for Freight Movements. Policy C4 outlines that the urban areas across Northamptonshire can be better connected. This will be done by providing an effective, reliable inter-urban public transport network connecting major towns, including prioritising the development of the Northamptonshire Arc. Policy C5 outlines how local and neighbourhood connections will be enhanced. Policy C6 states that “...the design and construction of HS2 must minimise adverse impacts on the environment”.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: - Policy ST1 – Sustainable Transport Infrastructure; and - Policy ENV6 – Daventry Country Park and Grand Union Canal Link.	Ref. 20	Policy ST1 outlines the approaches to promote sustainable transport in the area, particularly those relating to walking and cycling. Policy ENV6 states that “...the Council will support proposals that enhance Daventry Country Park’s recreation, leisure, health and wellbeing and cultural assets providing they protect manage or enhance important existing habitats and heritage assets. The Daventry North East Sustainable Urban Extension will be expected to make provision for an extension to the Country Park and a link between the Grand Union Canal and Town Centre. This should:

Local authority	Relevant local policy	Reference	Relevance to the assessment
			• <i>Incorporate areas of linked natural and semi-natural green space including a transitional landscape zone between the Country Park and the SUE;</i> • <i>Provide a linear park including footpath and cycleway connections to the GUC; and</i> • <i>Future development in proximity to Daventry Country Park should preserve or enhance the setting of the Daventry Reservoir Conservation Area and the GUC”.</i>
	New Local Plan for West Northamptonshire 2041: • Policy TR1 – Sustainable transport; • Policy TR2 – Strategic Connections; • Policy TR3 – Future Transport Schemes; • Policy TR4 – Leisure Canal Moorings; and • Policy TR5 – PSID – Canalside Development.	Ref. 21	Policy TR1 outlines that development proposals should demonstrate the following principles relating to sustainable travel: • Prioritise pedestrian, wheeler, cyclist and public transport users ahead of car users; • Ensure new development is located close to or along existing sustainable transport corridors; • Design of new development encourages walking, wheeling and cycling; and • Promote and support improvements to the transport network which increases safety, air quality and encourages sustainable modes of transport. Further to this, applications for developments will need to be accompanied by a TA or a TS, which will assess the impact of development on the transport network. A TP will be required to accompany applications for major developments. Policy TR2 outlines that the retention and enhancement of West Northamptonshire’s strategic connections will be prioritised. Support will be given to proposals that make use of the canal network for freight movements.

Local authority	Relevant local policy	Reference	Relevance to the assessment
			Policy TR3 outlines that land will be safeguarded to support the delivery of the South of the Towcester (A5) Southern Relief Road. Policy TR4 states that “...a range of additional short-term visitor moorings will be supported”, and that “existing visitor mooring will be protected”. Policy TR5 outlines that proposals for new developments alongside canals will be supported. Proposals for canal related development with limited-service facilities will be accepted if they have no negligible impacts on residents, facilities, infrastructure and the environment.
Milton Keynes City Council	Plan: MK 2016 – 2031: • Policy CT1 – Sustainable Transport Network; • Policy CT2 – Movement and Access; • Policy CT3 – Walking and Cycling; • Policy CT4 – Crossover on Redways; and • Policy CT5 – Public Transport.	Ref. 22	Policy CT1 states that “...the Council will promote a sustainable pattern of development in Milton Keynes, minimising the need to travel and reducing dependence on private vehicles”. Policy CT2 states that “...development proposals will be required to minimise the need to travel, promote opportunities for sustainable transport modes, improve accessibility to services and support the transition to a low carbon future”. The policy also states that “...development proposals that will generate significant amounts of movement or impact on level crossings must be supported by a TS or TA”. Policy CT3 outlines that the Council will support developments which includes pedestrian and cycle links to adjoining areas. Policy CT4 states that “...new development proposals should aim to protect and enhance the existing Redways in the Borough. Where development proposes to crossover or remove an existing section of a Redway, a safe crossover

Local authority	Relevant local policy	Reference	Relevance to the assessment
			<i>or convenient alternative route should be provided, which safeguards the existing network and does not impede or comprise the safety of highway users”.</i> Policy CT5 states that “...development proposals must be designed to meet the needs of public transport and users. In particular: • <i>Road layouts must include direct, convenient and safe public transport routes and be free of obstructive parking;</i> • <i>Public transport priority measures must be implemented, where appropriate;</i> • <i>All houses and most other developments are no more than 400 m from a bus stop;</i> • <i>Bus stops must have good pedestrian access, be open to public supervision and be sheltered where appropriate; and</i> • <i>Specific consideration must be given to the provision of public transport services in planning new development”.</i>
	New City Plan: Ambition and Objectives Consultation 2023	Ref. 23	Milton Keynes City Council New City Plan is still at consultation stage at the time of writing of this report.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: • Policy T1 – Delivering the sustainable transport vision; • Policy T2 – Supporting and Protecting Transport Schemes; • Policy T3 – Supporting Local Transport Schemes;	Ref. 24	Policy T1 states that “...the strategy to deliver sustainable transport in Aylesbury Vale is based on encouraging modal shift with greater use of more sustainable forms of transport and improving the safety of all road users”. Policy T2 states that “...planning permission will not be granted for development that would prejudice the implementation of existing or protected transport schemes”. Policy T3 states that “...the Council will actively support key transport proposals including those identified in both the Aylesbury Transport Strategy and the Buckingham

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy T4 – Capacity of the transport network to deliver development; - Policy T5 – Delivering transport in new development; and - Policy T7 – Footpaths and cycle routes.		<i>Transport Strategy</i>". It also states that "<i>Planning permission will not be granted for developments that would prejudice or diminish the integrity of existing or supported transport schemes</i>". Policy T4 states that "...new development will be permitted where there is evidence that there is sufficient capacity in the transport network to accommodate increased demand". The policy also sets out a threshold for the requirement of a TA. Policy T5 states that "...transport and new development will only be permitted if the necessary mitigation is provided against any unacceptable transport impacts which arise directly from that development". Policy T7 outlines that for any development which will impact footpath or cycle networks the following criteria will apply: • Delivery of strategic cycle network and footpath improvements will be supported; • The Council will seek new or improved cycle access and facilities where necessary; and • The Council will ensure that the network of pedestrian and cycle routes are provided to give easy access to/through new developments.
	Aylesbury Transport Strategy	Ref. 25	The strategy is intended to address current issues on the transport network and therefore represents the opportunity for a single coordinated approach to planning improvements and upgrades to the transport network and will form a key transport policy document for both Buckinghamshire Council and Aylesbury Vale District Council (AVDC)

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Buckingham Transport Strategy (BTS)	Ref. 26	The “...aim of the BTS is to consider growth aspirations holistically and propose measures that address their impacts as a whole rather than the impact of each individual development.” “In addition to accommodating these future growth aspirations, the BTS should also address existing known transport issues in the town”. “The BTS is expected to provide a guiding transport policy for Buckingham, to prioritise transport schemes for the area, and to promote a coordinated approach towards transport investment”.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives: • Objective 8 – Transport, physical and digital connectivity.	Ref. 27	Objective 8 states that to “...improve connectivity across and between Buckinghamshire towns and villages with regional and national centres beyond by securing new sustainable transport infrastructure, upgrading existing infrastructure and improving digital connectivity”.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: • Policy T1 – Mitigation of Transport Impacts on the Network; and • Policy T2 – Highways Safety Design.	Ref. 28	Policy T1 outlines that TP, TS and TA are required for any development that is above the gross floor area thresholds set out in the Council’s Guidance on TPs and TA. Policy T2 states that “...proposals for new developments must not have a detrimental effect on highway safety and patterns of movement”. The policy outlines that development proposals will be permitted where the proposals integrate with existing transport networks, avoids severance, does not impeded the flow of traffic, enhances/retains and promotes active travel networks.

Guidance and Standards

20.2.4 Relevant guidance and standards which have been used as part of the scoping process are listed below; these will also be taken into account as part of the EIA:

- a. Planning Practice Guidance (PPG) (Ref. 29); and
- b. Institute of Environmental Management and Assessment's (IEMA) Guidance: Environmental Assessment of Traffic and Movement (Ref. 30).

20.3 Consultation

20.3.1 A summary of key topics raised during non-statutory consultation with regards to traffic and transport is provided below:

- a. Impact on local residents during construction in relation to maintaining access, parking, roads and PRow's closures and associated diversion routes;
- b. Concerns relating to choice of construction accesses to/from the Proposed Development, including use of the canal network for transporting construction materials; and
- c. Impact on the canal and its users during construction.

20.3.2 These topics will be addressed accordingly in the next stage of EIA at PEIR and ES.

20.3.3 Furthermore, as part of the EIA process for PEIR and ES stages, consultation will be undertaken with National Highways, local highway authorities and local planning authorities (as required) to inform the assessment and mitigation for the Proposed Development.

20.4 Study Area

20.4.1 This section sets out the study areas adopted for each element of the Proposed Development.

20.4.2 It is proposed that the study area will encompass any roads (e.g. motorways, A-Road, B-Roads and country lanes) and PRow's (e.g. footpaths, bridleways and canal towpaths) intersected by the EIA Scoping Boundary as well as junctions in proximity to such intersection.

20.4.3 The extent of the study area will be dependent on the type of construction proposed. If temporary road closures are necessary, then a larger study area may be required due to potential route diversions.

20.4.4 In addition, the study area will be established by determining the most probable routes for construction traffic for both the movement of (e.g.) waste, materials, equipment and employees once these have been estimated at the PEIR and ES stage of design.

20.5 Baseline Conditions

Existing Baseline

- 20.5.1 This section provides a summary of the baseline conditions in respect of traffic and transport. The baseline conditions described in this section will be further assessed and informed by a review of the following data sources:
- a. Publicly available mapping, and aerial imagery from Google Maps;
 - b. Publicly available online information such as Council Definitive Maps, Rowmaps, Department for Transport (DfT) traffic counts, and collision data from Crashmap; and
 - c. Where deemed necessary, data such as traffic surveys can be conducted on roads and/or junctions which are likely to have significant traffic impact associated from the construction and/or operation of the Proposed Development.
- 20.5.2 An overview of the existing baseline for roads (i.e. intersected and/or likely to be affected by the temporary diversions of closures or routes that will experience a temporary increase in traffic flow as a direct result of construction activities) are listed in **Appendix 20-1** in Volume 3 of this EIA Scoping Report (as presented in **Figures 20-1 to 20-6**, in Volume 2 of this EIA Scoping Report). In summary:
- a. Part 1a: a total of 1 road;
 - b. Part 1b: a total of 35 roads;
 - c. Part 2: a total of 134 roads;
 - d. Part 3: a total of 13 roads;
 - e. Part 4a: a total of 3 roads; and
 - f. Part 4b: a total of 92 roads.
- 20.5.3 An overview of the existing baseline for the PRowS (i.e. PRowS that will be temporarily closed or diverted) are listed in **Appendix 20-2** in Volume 3 of this EIA Scoping Report (as presented in **Figures 20-7 to 20-12**, in Volume 2 of this EIA Scoping Report). In summary:
- a. Part 1a: a total of 2 PRowS, comprising of 2 footpaths;
 - b. Part 1b: a total of 25 PRowS, comprising of 22 footpaths and 3 bridleways;
 - c. Part 2: a total of 101 PRowS, comprising of 90 footpaths and 11 bridleways;
 - d. Part 3: a total of 12 PRowS, comprising of 8 footpaths and 4 bridleways;
 - e. Part 4a: a total of 5 PRowS, comprising of 5 footpaths; and
 - f. Part 4b: a total of 61 PRowS, comprising of 49 footpaths and 12 bridleways.

Future Baseline

- 20.5.4 The ES will consider future baseline conditions on the road network within the study area for the relevant assessment year which is likely to be during the peak construction period (to be confirmed in the PEIR and the ES) as well as during the anticipated full build out year (currently assumed as 2032). Nonetheless, it is anticipated that the future baseline will not significantly change when compared to the existing baseline.
- 20.5.5 The base traffic flows will be factored up to the future base year using growth factors derived from TEMPro v8.0 for the relevant areas and road types impacted by the Proposed Development.

20.6 Potential Effects

Construction Phase

- 20.6.1 The scoping of potential traffic and transport effects during the construction phase of the Proposed Development is presented in **Table 20-3** below.

Table 20-3: Potential effects during the construction phase – Traffic and Transport

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Construction impact on severance of communities	In	All	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on severance of communities has been scoped into the EIA.
Construction impact on pedestrian delay	In	All	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on pedestrian delay has been scoped into the EIA. PRowS may also be subject to a permanent diversion or temporary closure, causing delay to pedestrians, and are therefore scoped into the EIA.
Construction impact on non-motorised user amenity	In	All	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on non-motorised user amenity has been scoped into the EIA. PRowS may also be subject to temporary closure/diversion, causing

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			disruption to non-motorised user amenity and are therefore scoped into the EIA.
Construction impact on fear and intimidation on and by road users	In	All	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on fear and intimidation on and by road users has been scoped into the EIA.
Construction impact on road vehicle driver and passenger delay	In	All	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on vehicle driver and passenger delay has been scoped into the EIA.
Construction impact on hazardous/large loads	Out	All	The construction of the Proposed Development would not likely generate significant hazardous/large loads. As such, hazardous/large loads during the construction phase are scoped out of the EIA for all Parts of the Proposed Development. However, this will be addressed within the TA.

Operational Phase

20.6.2 The scoping of potential traffic and transport effects during the operational phase of the Proposed Development is presented in **Table 20-4**.

Table 20-4: Potential effects during the operational phase – Traffic and Transport

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Operational impact on severance of communities	Out	All	Operational traffic will primarily comprise operators of the Minworth AWTP (Part 1a) and abstraction, storage and treatment site in Part 4a, and maintenance visits, as required, to the two pipelines (Part 1b and 4b)
Operational impact on	Out	All	

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
pedestrian delay			and canal network (Parts 2 and 3). The traffic associated with the operational phase will be minimal and mainly in relation to the maintenance of the new structures introduced by the Proposed Development. The expected level of traffic generated during operation (including maintenance) would not result in potential significant effects. Therefore, assessment of operational traffic impacts can be scoped out. Existing canal navigation will not be significantly impacted by the Proposed Development as it will be designed accordingly to allow canal users to continue to navigate the canal network with minimal disruption. Refer to Chapter 17: Major Accidents and Disasters with regards to canal navigation risks. If PRoWs are permanently diverted, the assessment of the effects is scoped into the EIA; however, this is not currently proposed.
Operational impact on non-motorised user amenity	Out	All	
Operational impact on fear and intimidation on and by road users	Out	All	
Operational impact on road vehicle driver and passenger delay	Out	All	
Operational impact on hazardous/large loads	Out	All	

20.7 Approach to Assessment

Establishing Baseline Conditions

20.7.1 The traffic and transport baseline conditions will be assessed and informed by a review of the following data sources:

- a. Publicly available mapping, and aerial imagery from Google Maps;
- b. Publicly available online information such as Council Definitive Maps, Rowmaps, Department for Transport (DfT) traffic counts and collision data from Crashmap; and
- c. Where deemed necessary, other data such as traffic surveys can be conducted on roads and/or junctions which are likely to have significant traffic impact associated with construction of the Proposed Development.

Assessment Methodology

- 20.7.2 The assessment methodology for traffic and transport is based on the on IEMA's Environmental Assessment of Traffic and Movement guidelines (Ref. 30) (the 'IEMA Guidance').

Assessment Criteria

- 20.7.3 In accordance with the IEMA Guidance, the following criteria will be considered in the assessment of the construction phase:
- a. Severance of communities;
 - b. Pedestrian delay (incorporating delay to all non-motorised users);
 - c. Non-motorised user amenity;
 - d. Fear and Intimidation on and by road users;
 - e. Road vehicle driver and passenger delay;
 - f. Road user and pedestrian safety; and
 - g. Hazardous/large loads.
- 20.7.4 The receptors which may be impacted will be identified based on the likely locations in which traffic may come to and from (i.e. the forecast increase in vehicle movements associated with the construction of the Proposed Development).
- 20.7.5 The following user groups are to be considered:
- a. Non-motorised users;
 - b. Public right of way users (e.g. canal towpath users / horse riders);
 - c. Motorists and freight vehicles;
 - d. Public transport; and
 - e. Emergency services.
- 20.7.6 When assessing the traffic impacts, there are a range of particular groups and locations which may be sensitive to changes in traffic conditions compliant with the criteria previously outlined. These are outlined in the IEMA Guidance as 'Affected Parties', as follows:
- a. People at home;
 - b. People at work;
 - c. Sensitive and/or vulnerable groups (including young age, older age, income, health status, social disadvantage and access and geographic factors);
 - d. Locations with concentrations of vulnerable users (e.g. hospitals, places of worship and schools);
 - e. Retail areas;
 - f. Recreational areas;
 - g. Tourist attractions;
 - h. Collisions clusters and routes with road safety concerns; and

- i. Junctions and highway links at (or over) capacity.

20.7.7 The IEMA Guidance sets out two rules in identifying potential links for analysis:

- a. *“Rule 1: include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and*
- b. *Rule 2: include any other specifically sensitive areas (e.g., accident black spots, conservation areas, hospitals, links with high pedestrian flows etc.) where traffic flows have increased by 10% or more”.*

20.7.8 Under Rule 1, the guidance indicates that: *“...the day-to-day variation of traffic on a road is frequently at least + or -10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact”.*

20.7.9 Furthermore, a negligible magnitude of change will be assigned where traffic flow (or HGV) increase is less than 30% per hour during each of the development peak hours due to the construction of the Proposed Development in line with Rule 1.

20.7.10 A negligible magnitude of change will be assigned where there is expected to be fewer than 30 additional vehicle trips per hour during each of the development peak hours as a result of the construction of the Proposed Development (except for the assessment of hazardous/large loads), irrespective of the proportional increase in traffic flows. This is designed to avoid over-reporting impacts in areas where baseline traffic flows are very low and is in line with the IEMA Guidance which states that caution should be observed when applying thresholds to very low baseline flows given that these are unlikely to experience impacts even with high percentage changes in traffic.

20.7.11 The vehicle routeing and movements associated with the construction of the Proposed Development (including abnormal loads) will be identified within the Transport Assessment. This will include a review of the suitability of the proposed routes for abnormal loads and the respective owning authorities of these routes and structures will be notified.

20.7.12 As a general rule, the forecast changes to baseline (magnitude of change), the relative value/sensitivity/importance of the affected receptor and the scale, nature and significance of the effect (consequence) should be considered. In addition, the anticipated effect should be classified as short-term, medium-term or long-term, as well as permanent or temporary.

20.7.13 Assessments will be undertaken at the anticipated peak construction period as this will be the worst-case scenario. The traffic associated with the construction of the Proposed Development will be distributed onto the surrounding highway network or where the Proposed Development crosses the highway network, footways/cycleways and PRowS.

20.7.14 Baseline traffic flows will be factored up to the future year scenario by adopting growth factors derived from TEMPro utilising the latest National Trip End Model (NTEM) datasets for the relevant areas potentially impacted by the construction of the Proposed Development.

Sensitivity of Receptors

20.7.15 The general criteria for defining the importance or sensitivity of receptors are set out in **Table 20-5**, which applies to the assessment of Severance, Pedestrian Delay, Non-Motorised User Amenity, and Fear and Intimidation. Key factors influencing this include:

- a. The value of the receptor or resource based upon empirical and/or intrinsic factors, for example considering any legal or policy protection afforded which is indicative of the receptor or resources' value internationally, nationally or locally; and
- b. The sensitivity of the receptor or resource to change, for example is the receptor likely to acclimatise to the change. This will consider legal and policy thresholds which are indicative of the ability of the resources to absorb change.

Table 20-5: Sensitivity Criteria of Affected Parties / Receptors (Severance, Pedestrian Delay (incorporating delay to all no-motorised users), Non-motorised User Amenity, and Fear and Intimidation)

Sensitivity	Receptors
High	Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident blackspots, retirement homes, urban/residential roads without footways that are used by pedestrians.
Medium	Traffic flow sensitive receptors including congested junctions, doctor's surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, un-segregated cycleways, community centres, parks, recreation facilities.
Low	Receptors with some sensitivity to traffic flow: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision.
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distanced from affected roads and junctions.

20.7.16 The general criteria for defining the importance or sensitivity of receptors for the assessment of Driver Delay are set out in **Table 20-6**.

Table 20-6: Sensitivity Criteria of Affected Parties / Receptors (Driver Delay)

Sensitivity	Receptors
High	Road Links: Key local route which forms part of a public transport corridor within a built-up area. Road Junctions: Roundabout or signalised junction (at least four arms) within a built-up area or a junction with high queuing expected.

Sensitivity	Receptors
Medium	Road Links: Key local route within a built-up area. Road Junctions: Roundabout or signalised junction (at least four arms) within a built-up area or a junction with moderate/high queuing expected.
Low	Road Links: Strategic route within a built-up area OR a local route outside of a built-up area. Road Junctions: Roundabout or signalised junction (fewer than four arms) outside of a built-up area OR a priority junction within a built-up area with low/moderate queuing expected.
Negligible	Road Links: Strategic route outside of a built-up area OR a minor/ local no-through route. Road Junctions: Priority junction outside of a built-up area with no/low queuing expected.

20.7.17 The preliminary criteria for defining the importance or sensitivity of receptors for the assessment of Road Safety and Hazardous/Large Loads are set out in **Table 20-7**. The collision rate for road links has also been calculated and compared with national road safety statistics provided within Road Casualties for Great Britain to determine an appropriate receptor sensitivity level.

Table 20-7: Sensitivity Criteria of Affected Parties / Receptors (Road Safety and Hazardous/Large Loads)

Sensitivity	Road Safety	Hazardous/Large Loads
High	10+ collisions in five years, or more than three serious collisions and/ or one fatal collision in five years	5+ serious/fatal collisions (or more than one fatal collision) involving a goods vehicle (>3.5 tonnes) in five years
Medium	5-9 collisions (with up to three serious collisions and/ or one fatal collision) in five years	3-4 serious/fatal collisions (with up to one fatal collision) involving a goods vehicle (>3.5 tonnes) in five years
Low	3-4 collisions in five years (with up to one serious collision and no fatal collisions) in five years	1-2 serious collisions (with no fatal collisions) involving a good vehicle (>3.5 tonnes) in five years
Negligible	Fewer than 3 collisions (with no serious or fatal collisions) in five years	No serious or fatal collisions involving a goods vehicle (>3.5 tonnes) in five years

Magnitude of Impacts

20.7.18 As identified within the IEMA Guidance, the magnitude of each impact represents the level of change from the baseline conditions.

- 20.7.19 This assessment will consider the potential effects that could be experienced during construction. The operational phase of the development will result in negligible to zero traffic and as such is scoped out of the assessment. This section identifies how magnitude will be considered for each type of effect.
- 20.7.20 Severance is defined in the IEMA Guidance as the “...*perceived division that can occur within a community when it becomes separated by major traffic infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure*”. The IEMA Guidance states that changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively. However, caution should be observed when applying these thresholds to very low baseline flows which are unlikely to experience severance impacts even with high percentage changes in traffic.
- 20.7.21 Driver Delay relates to incremental increases in traffic (as outlined in **Table 20-9**). However, traffic delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the network.
- 20.7.22 Pedestrian Delay (incorporating delay to all non-motorised users) is considered to be affected by the changes in volume, composition or speed of traffic, in terms of their respective impacts on the ability of pedestrians to crossroads. The assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads. In general, increases in traffic levels and/or traffic speeds are likely to lead to greater increases in pedestrian delay.
- 20.7.23 Non-Motorised User Amenity is broadly defined as “...*the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic*”. The guidance suggests that a tentative threshold for judging the significance of changes in non-motorised user amenity would be where the traffic flow (or HGV component) is halved or doubled.
- 20.7.24 Fear and Intimidation occurs through a combination of traffic flow, heavy vehicle composition, speed, and the proximity of traffic to people. These indicators are often heightened by a perceived lack of protection or buffers from the highway or through narrow or non-existent footways. The assessment considers each road on a case-by-case basis, however there are thresholds provided in the IEMA Guidance which are presented in **Table 20-9**.
- 20.7.25 Details relating to Fear and Intimidation, in terms of calculating magnitude of impact based on the IEMA Guidance, are provided in **Table 20-8**.

Table 20-8: Magnitude of Effect of Affected Parties / Receptors for Fear and Intimidation

Criteria	Degree of Hazard Level			
	Small	Moderate	Great	Extreme
a) Average Traffic Flow over 18-hour day – all vehicles / hour 2-way	<600	600 – 1200	1201 – 1800	>1800
Degree of hazard score	0	10	20	30
b) Total 18-hour heavy vehicle flow	<1000	1000 – 2000	2001 – 3000	>3000
Degree of hazard score	0	10	20	30
c) Average vehicle speed (mph)	<20 mph	20 – 30 mph	31 – 40 mph	>40 mph
Degree of hazard score	0	10	20	30

20.7.26 The combined score for each criteria are then assigned a level of fear and intimidation based on the following scoring system:

- Small – Total hazard score of 0- 20;
- Moderate – Total hazard score of 21- 40;
- Great – Total hazard score of 41- 70; and
- Extreme – Total hazard score of 71+.

20.7.27 **Table 20-9** sets out the proposed magnitude thresholds for the respective environmental effects, contextualising the impact to the base scenario.

Table 20-9: Magnitude of Effect of Affected Parties / Receptors

Impact	Negligible	Low	Medium	High
Severance	Increase in total traffic flows of below 30% (or increase in HGV flows of below 10%).	Increase in total traffic flows of 30-59% (or increase in HGV flows of 10-39%).	Increase in total traffic flows of 60-89% (or increase in HGV flows of 40-89%).	Increase in total traffic flows or HGV flows of 90% and above.
Pedestrian Delay	Increase in total traffic flows of below 30% (or increase in HGV flows of below 10%).	Increase in total traffic flows of 30-59% (or increase in HGV flows of 10-39%).	Increase in total traffic flows of 60-89% (or increase in HGV flows of 40-89%).	Increase in total traffic flows or HGV flows of 90% and above.
Non-Motorised User	Increase in total traffic flows of below	Increase in total traffic flows of 50-	Increase in total traffic flows of 70-	Increase in total traffic flows of 100%

Impact	Negligible	Low	Medium	High
Amenity	50%.	69%.	99%.	or above.
Fear and Intimidation	No change in degree of hazard level for daily traffic flows, HGV flows and vehicle speeds (see Table 20-8).	One step change in degree of hazard level (see Table 20-8), but with <400 daily vehicle increases or <500 daily HGV increase.	One step change in degree of hazard level (see Table 20-8), but with >400 daily vehicle increases or >500 daily HGV increase.	Two step changes in degree of hazard level based on the degree of hazard scores for daily traffic flows, HGV flows and vehicle speeds (see Table 20-8).
Driver Delay	Increase in total traffic flows of below 30%.	Increase in total traffic flows of 30-59%.	Increase in total traffic flows of 60-89%.	Increase in total traffic flows of 90% and above.
Road Safety	Increase in total traffic flows of below 30% (or increase in HGV flows of below 10%).		All links estimated to experience increases in total traffic flows of at least 30% or increases in HGV flows of at least 10% are analysed further on a case-by-case basis.	

20.7.28 Road Safety considers Personal Injury Accident (PIA) data obtained for the most recent five-year period available at junctions and links along the proposed construction traffic routes. The sensitivity of discrete areas of the highway network can then be determined following a detailed review of the baseline characteristics including the collision rate and any collision clusters.

20.7.29 **Table 20-8** and **Table 20-9** summarise the criteria that will be used to assess the magnitude of effect (based on increases i.e. 'adverse' effects), along with the thresholds that will be used to determine whether effects are considered high, medium, low or negligible. Depending on the baseline information available, the various thresholds identified for the proportional increases in traffic flow relate to peak hour flows and daily flows (whichever is highest). Within these tables, neither the sensitivity of receptors, nor the duration of effects, is taken into consideration.

Effect Significance

20.7.30 The classification of effects is determined through the consideration of two elements; the magnitude of the impact and the sensitivity of the receptor as outlined above. **Table 20-10** shows the matrix that will be used to determine the effect category. Effects which are classified as major or moderate are considered to be 'significant' (shown in **bold**) whilst effects classified as Minor or Negligible are considered to be not significant.

Table 20-10: Classification of effects

Magnitude	Value and sensitivity of receptor			
	Very Low	Low	Medium	High
Very Low	Negligible	Negligible	Minor	Minor
Low	Negligible	Minor	Minor	Moderate
Medium	Minor	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

20.7.31 **Table 20-11** provides a definition of the classification of effects.

Table 20-11: Definition of effects

Effect	Description
Major	Effects, both adverse and beneficial, which are likely to be important considerations at a national to regional level because they contribute to achieving national/regional objectives, or which are likely to result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Effects that are likely to be important considerations at a regional and local level.
Minor	Effects that could be important considerations at a local level.
Negligible	An effect that is likely to have a negligible or neutral influence, irrespective of other effects.

20.8 Assumptions, Limitations, and Uncertainties

- 20.8.1 It is considered likely that transport and traffic impacts would primarily be associated with the delivery of materials and contractor movements to and from the construction compounds associated with the Proposed Development for all Parts. It has been assumed that all construction related trips will be by road; however, consideration will be given to transporting materials by water/boats, where feasible.
- 20.8.2 Traffic and transport impacts are anticipated as a result of potential road works, closures and diversions. Similarly, temporary closures and diversions are expected to be required for a number of PRowS and the canal towpath to enable construction. An assessment of the impacts of any permanent PRowS diversions will be undertaken if identified for the Proposed Development.
- 20.8.3 For the Part 2 EIA Scoping Boundary (Non-Indicative Working Area), i.e. where no physical works or construction compounds are to be situated, are proposed, it is assumed that there will be no traffic impact on the surrounding highway network or PRowS.

20.9 Approach to Mitigation

- 20.9.1 During construction, standard measures and any required mitigation or monitoring to avoid/minimise impacts will be specified within a Code of

Construction Practice (CoCP) and Outline Construction Traffic Management Plan (CTMP).

- 20.9.2 Furthermore, the final design of the Proposed Development will take into consideration opportunities to avoid/minimise adverse impacts on the local road and PRow networks.

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Chapter 21: Materials and Waste

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21. Materials and Waste

21.1 Introduction

- 21.1.1 This chapter presents the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on materials and waste. The decommissioning phase is scoped out of the assessment as outlined in **Chapter 6: EIA Approach**.
- 21.1.2 This chapter follows the methodology set out in the Institute of Environmental Management and Assessment (IEMA) Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach (the 'IEMA Guidance') (Ref. 1).
- 21.1.3 For the purposes of this EIA Scoping Report, materials and waste comprise:
- a. The consumption of materials (key construction materials only including concrete, aggregate, asphalt and steel); and
 - b. The generation and management of waste.
- 21.1.4 Materials are defined in the IEMA Guidance as (Ref. 1):
- “Physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel.”*
- 21.1.5 Other material assets considered include built assets, such as landfill void capacity, waste management facilities and safeguarded mineral and waste sites.
- 21.1.6 For the purposes of this EIA Scoping Report safeguarded mineral sites are defined as operational sites identified in Local Plan documents, such as quarries and wharves.
- 21.1.7 Mineral Safeguarding Areas (MSA) are not deemed to be safeguarded mineral sites and are not included in the IEMA Guidance (Ref. 1) and therefore are not assessed in a materials and waste assessment. Instead, these have been considered within **Chapter 14: Ground Conditions** of this EIA Scoping Report.
- 21.1.8 Waste is defined as per the Waste Framework Directive (Ref. 2) as “...any substance or object which the holder discards or intends or is required to discard”.
- 21.1.9 This chapter is also supported by **Figure 21-1: Safeguarded Mineral and Waste Sites, Historic and Authorised Landfills, Permitted Waste Sites and Waste Site Applications** in Volume 2 of the EIA Scoping Report.

21.2 Legislation, Planning Policy Context, and Guidance

- 21.2.1 Legislation, planning policy and guidance relating to materials and waste is outlined below.

Legislation

21.2.2 The applicable legislation includes:

- a. Waste Framework Directive 2008 (Ref. 2);
- b. Environmental Protection Act 1990 (Ref. 3);
- c. The Hazardous Waste (England and Wales) Regulations 2005 (Ref. 4);
- d. The Waste (England and Wales) Regulations 2011 (Ref. 5);
- e. The Environmental Permitting (England and Wales) Regulations 2016 (Ref. 6); and
- f. Environment Act 2021 (Ref. 7).

21.2.3 The Waste (England and Wales) Regulations 2011 require businesses to apply the waste hierarchy (which prioritises waste prevention, followed by preparing for reuse, recycling, other recovery (e.g. energy recovery and finally disposal) to the waste they produce. The Waste (England and Wales) Regulations 2011 also require that measures are taken to ensure that, by the year 2020 and beyond, at least 70% by weight of non-hazardous construction and demolition waste is subjected to material recovery. The target specifically excludes naturally occurring materials with European Waste Catalogue (EWC) Code 17 05 04 (17 05 04 soil and stones other than those mentioned in Code 17 05 03* (soils and stone containing dangerous substances)). Materials and waste assessments are based on the principles and definitions provided within the Waste (England and Wales) Regulations 2011.

21.2.4 A departure from the waste hierarchy can be undertaken so as to achieve the best overall environmental outcome where this is justified by life-cycle thinking on the overall impacts of the generation and management of the waste. However, the following considerations must also be taken into account:

- a. Environmental protection principles of precaution and sustainability;
- b. Proximity principle for treatment and disposal of waste to be as close to its source as possible;
- c. Technical feasibility and economic viability;
- d. Protection of resources; and
- e. Overall environmental, human health, economic and social impacts.

National Policies, Plans and Strategies

21.2.5 The relevant national policies, plans and strategies for materials and waste are summarised within **Table 21-1** below.

Table 21-1: National policies, plans and strategies – Materials and Waste

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 8)	The following policies are relevant: • Resource and waste management: • Paragraphs 4.12.1-4.12.5 sets out government policy, guidance on the waste hierarchy, environmental permitting, and waste duty of care). • Paragraphs 4.12.6 to 4.12.8 sets out requirements for the Applicant's materials and waste assessment.	The policy sets out requirements for mitigation (e.g. applying the waste hierarchy and waste duty of care) and for the preparation of a Site Waste Management Plan (SWMP) and Materials Management Plan (MMP), where relevant.
National Planning Policy Framework (NPPF) (Ref. 9)	The following policies are relevant: • Achieving sustainable development, Section 2, paragraph 8; and • Facilitating the sustainable use of minerals, Section 17, paragraph 216.	Achieving sustainable development means the planning system has three overarching objectives, one being the environmental objective which refers to "<i>minimising waste</i>". It states that the objectives should be "<i>delivered through the preparation and implementation of plans</i>". Section 17 addresses the sustainable use of minerals by setting out planning policy requirements in relation to material extraction, substitute and recycled materials, mineral safeguarding areas and safeguarded sites etc. This information will be reflected in the assessment in accordance with the local plans set out in Table 21-2.
National Planning Policy for Waste (2015) (Ref. 10)	The policy states: "...when determining planning applications for non-waste development, local planning authorities should, to the extent appropriate to their responsibilities, ensure that: • the likely impact of proposed, non-waste related development on existing waste management	The National Planning Policy for Waste sets out detailed waste planning policies to be applied in conjunction with the NPPF.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	<i>facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities;</i> <i>new, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development; and</i> <i>the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal.”</i>	
The Waste Management Plan for England (2021) (Ref. 11)	Page 7 of the plan highlights the need for waste to be managed using the proximity principle and confirms England's commitment to recovering at least 70% by weight of non-hazardous construction & demolition (C&D) waste by 2020 (excluding soils and stones). Recovery is assumed in the context of this policy to include reuse, recycling and incineration with energy recovery.	The Plan provides an overview of waste management in England and reiterates the requirement for all waste producers and waste management providers to implement the waste hierarchy. The targets are referred to in Section 21.5 Baseline Conditions of this chapter.
A Green Future: Our 25 Year Plan to Improve the Environment (2018) (Ref. 12)	The following policies are relevant: - Make sure that resources are used more efficiently and kept in use for longer to minimise waste and reduce its environmental impacts by promoting reuse, remanufacturing and recycling; - Work towards eliminating all avoidable waste by 2050 and all avoidable plastic waste by end of 2042;	The policies within the plan are considered in Section 21.8 Approach to Mitigation of this chapter.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	- Reducing litter and littering; and - Improving management of residual waste.	
Our Waste, Our Resources, A Strategy for England (Resources and Waste Strategy for England) (2018) (Ref. 13)	Key targets and milestones and targets, which could be relevant to the Proposed Development, include: - Legislation for mandatory separate food waste collections – by the end of March 2026; 75% recycling rate for packaging (subject to consultation); 65% recycling rate for municipal solid waste – 2035; and - Municipal waste to landfill 10% or less – 2035.	Targets are considered in Section 21.8 Approach to Mitigation of this chapter.
Environmental Improvement Plan (2023) (Ref. 14)	The Plan builds on the 25 Year Plan to Improve the Environment (Ref. 12) and confirms that Defra will publish the new maximising resources and minimising waste programme in England. The programme will set out the Government's priorities for action across seven key sectors, including construction, to manage resources and waste in accordance with the waste hierarchy. The Government is working to publish a revised Code of Practice for the sustainable use of soil on construction sites, which will help to reduce the amount of soil sent to landfill. A Soil Reuse and Storage Depot scheme will be developed to help prevent soil that would otherwise be classified as waste going to landfill and encourage remediation and reuse of soil. The scheme will be piloted by Defra by 2026.	These targets are considered in Section 21.8 Approach to Mitigation of this chapter.

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
	The Plan also includes commitments to eliminate avoidable plastic waste by 2042 and avoidable waste by 2050.	

Local Policy

- 21.2.6 The local policies listed in **Table 21-2** are considered relevant to the scope and method of the assessment of potential material and waste impacts presented in this chapter.

Table 21-2: List of relevant local policy – Materials and Waste

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Adopted Birmingham Development Plan 2011-2031: • TP1: Reducing the City's carbon footprint – Encouraging the use of waste as a resource (Policy TP13); • TP3: Sustainable construction - Minimise waste and maximise recycling during construction and operation; • TP13: Sustainable management of the City's waste - In the case of development on any site of over 5 ha, the Council will require the preparation of a strategy for the prevention, minimisation and management of waste; • TP14: New and existing waste facilities - Protecting existing facilities that contribute to waste management capacity, provided that they meet the criteria in Policy TP15 and do not have a negative impact on the environment and amenities; • TP15: Location of waste management sites: – The Tyseley Environmental Enterprise Area which has potential to accommodate new waste and sustainable energy technologies, including recycling, Combined Heat and Power and waste recovery; – Other industrial areas including the Core Employment Areas identified on the Policies Map; – Sites currently or previously in use as waste management facilities; and – Appropriate sites adjacent to existing waste management facilities. • TP16: Minerals - Minerals infrastructure, including sites for concrete batching, the manufacture of coated materials, other	Ref. 15	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites, and mitigation.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	concrete products and the handling, processing and distribution of substitute, recycled and secondary aggregate material, and any associated bulk transport facilities will be protected.		
	Birmingham Development Plan Policies Map: Does not present specific material and waste related policies, however Core Employment Areas are considered as potential locations of waste management sites (Policy TP15 above).	Ref. 16	Policy map does not show safeguarded mineral/waste sites; however consideration of existing sites and core employment areas has been undertaken. There is no core employment area within the EIA Scoping Boundary. Existing waste sites are set out in Table 21-9 .
	New Local Plan for Birmingham 2042: Does not present material and waste related policies.	Ref. 17	No new policies for materials and waste are identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • LP29: Development Considerations: a. 14 - Seek to maximise opportunities to encourage reuse and recycling of waste materials, both in construction and operation; and b. 15 - Adequate space for bins should be provided within all new developments to enable the storage of waste and for materials to be re-cycled. Guidance is provided in the Document “<i>Design Guide for Bin Storage</i>”.	Ref. 18	Policies will be taken into account in the assessment of materials and waste including mitigation.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Adopted North Warwickshire Local Plan 2021 – Policy Map: Does not present material and waste related policies.	Ref. 19	Policy map does not show safeguarded mineral/waste sites; however it has been included for completeness.
	Warwickshire Minerals Local Plan 2018-2032: - Policy S0 – Overarching Policy – Mineral sites to be allocated (policies S1 – S9); - Policy MCS5: Safeguarding of Minerals and Minerals infrastructure - Minerals infrastructure safeguarded in Warwickshire comprises: permitted and allocated mineral sites; concrete batching plants; mortar plants; asphalt plants; concrete products plants; and recycled and secondary aggregates sites; and - Policy DM10: Mineral Safeguarding.	Ref. 20	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral sites.
	Minerals Local Plan policies map: Presents existing and safeguarded mineral site locations.	Ref. 21	The identified safeguarded mineral sites will be taken into account in the assessment of materials and waste.
	Warwickshire Waste Core Strategy: Policy CS8: Safeguarding of waste management sites.	Ref. 22	Policy will be taken into account in the assessment of materials and waste including safeguarded waste sites.
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: Policy BE3 – Sustainable design and construction - Development must minimise or reuse waste generated during the construction phase. This should be done by using materials and construction	Ref. 23	Policies will be taken into account in the assessment of materials and waste including mitigation.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	techniques that generate the least waste and minimise emissions. Waste should be treated as a resource to be re-used, recycled or recovered, and should only be disposed of when all other options have been explored. On-site management of waste will be preferred, unless the activities would result in unacceptable harm through impacts on the environment, transport or on neighbouring uses, or that management elsewhere would have wider sustainability benefits.		
	Borough Plan Policies Map: Does not present material and waste related policies.	Ref. 24	Policy map does not show safeguarded mineral/waste sites; however it has been included for completeness.
	Borough Plan Review 2021-2039: No relevant policies to materials and waste assessment.	Ref. 25	No new policies for materials and waste identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
	Warwickshire Minerals Local Plan 2018-2032: • Policy S0 – Overarching Policy – Mineral sites to be allocated (policies S1 – S9); • Policy MCS5: Safeguarding of Minerals and Minerals infrastructure; and • Policy DM10: Mineral Safeguarding.	Ref. 20	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites.
	Minerals Local Plan policies map: Presents existing and allocated mineral site locations	Ref. 21	The identified safeguarded mineral sites will be taken into account in the

Local authority	Relevant local policy	Reference	Relevance to the assessment
			assessment of materials and waste.
	Warwickshire Waste Core Strategy Policy CS8: Safeguarding of waste management sites.	Ref. 22	Policy will be taken into account in the assessment of materials and waste including safeguarded waste sites.
Coventry City Council	Coventry Local Plan 2011-2031: - Policy DS3: Sustainable Development Policy; - Policy EM2: Building Standards - Minimising waste and maximising recycling during construction and operation; - Policy EM8: Waste Management - relevant points include: - A requirement for development proposals to incorporate adequate storage for waste and recycling services along with safe access for collection vehicles; - Existing waste management facilities or land allocated for waste management uses being protected from encroachment by incompatible land uses that are more sensitive to odour, noise, dust and pest impacts; and - Development proposals should demonstrate measures to minimise the generation of waste in the construction, use and life of buildings and promote more sustainable approaches to waste management, including the reuse and recycling of construction waste and the promotion of layouts and designs that provide adequate space to facilitate waste storage, reuse, recycling and composting. - Policy EM9: Safeguarding Mineral Resources.	Ref. 26	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites, and mitigation.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	Coventry Local Plan policy map: Does not present material and waste related policies.	Ref. 27	Policy map does not show safeguarded mineral/waste sites; however it has been included for completeness.
	Local Plan Review: Issues and Options Consultation (2023): • Policy DS3: Sustainable Development Policy; • Policy DS4 (Part A): General Masterplan Principles; • Policy EM2: Building Standards; • Policy EM8: Waste Management; and • Policy EM9: Safeguarding Mineral Resources.	Ref. 28	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites, and mitigation.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: • Policy SDC1: Sustainable Design.	Ref. 29	Policies will be taken into account in the assessment of materials and waste including mitigation.
	Urban Policies Map: Does not present material and waste related policies.	Ref. 30	Policy map does not show safeguarded mineral/waste sites; however it has been included for completeness.
	Rugby Borough Local Plan review – issues and options consultation (2023) No relevant policies to materials and waste.	Ref. 31	No new policies for materials and waste identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
	Warwickshire Minerals Local Plan 2018-2032: – Policy S0 – Overarching Policy – Mineral sites to be safeguarded (policies S1 – S9);	Ref. 20	Policies will be taken into account in the assessment of materials and waste

Local authority	Relevant local policy	Reference	Relevance to the assessment
	– Policy MCS5: Safeguarding of Minerals and Minerals infrastructure; and – Policy DM10: Mineral Safeguarding.		including safeguarded mineral and waste sites.
	Minerals Local Plan policies map: Presents existing and allocated mineral site.	Ref. 21	The identified safeguarded mineral sites will be taken into account in the assessment of materials and waste.
	Warwickshire Waste Core Strategy: • Policy CS8: Safeguarding of waste management sites.	Ref. 22	Policy will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: • Policy S10 – Sustainable Development Principles.	Ref. 32	Policies will be taken into account in the assessment of materials and waste including mitigation.
	Northamptonshire Minerals and Waste Local Plan: • Policy 4: Mineral locations – Sites for the provision of sand and gravel in policy map as Mineral locations - Sites for the provision of sand and gravel; • Policy 5: Sites for the provision of crushed rock in policy map as Mineral locations - sites for the provision of crushed rock; • Policy 7: Sites for the provision of building and roofing stone in policy map as Mineral locations - sites for the provision of building and roofing stone;	Ref. 33	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy 13: Locations for waste management facilities in policy map as - industrial area locations for waste management uses; • Policy 26: Sustainable design and use of resources; • Policy 29: Safeguarding minerals and waste related development from alternate uses; and • Policy 30: Preventing land use conflict in policy map as - Preventing land use conflict consultation buffer Policy 30 minerals and waste allocations.		
	Minerals and Waste Local Plan Policies Map: Presents existing and allocated mineral site locations.	Ref. 35	Location of allocated mineral and waste sites will be taken into account in the assessment of materials and waste.
	West Northamptonshire Local Plan – 2041 (Regulation 18) Consultation Draft April 2024: • Policy PL1 – Sustainable design and construction.	Ref. 34	No new policies for materials and waste identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process. Whilst the current local plan timetable proposes that a final draft of the Plan will be consulted upon in early 2025, recent government proposals for plan making have implications for the progression of the local plan and that timetable.

Local authority	Relevant local policy	Reference	Relevance to the assessment
Milton Keynes City Council	Plan: MK 2016 – 2031: Policy SC1: Sustainable Construction.	Ref. 36	Policies will be taken into account in the assessment of materials and waste including mitigation.
	Plan: MK 2016-2031: Policy map Presents mineral allocations (building stone, sand and gravel).	Ref. 36	Location of mineral allocations will be taken into account in the assessment of materials and waste.
	New City Plan: Ambition and Objectives Consultation 2023: No relevant policies to materials and waste assessment.	Ref. 37	No new policies for materials and waste identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
	Minerals Local Plan – Adoption Version: - Policy 3: Site-specific allocations for the extraction of sand and gravel; - Policy 4: Site-specific allocations for the extraction of building stone; and - Policy 19: Safeguarding mineral-related developments and associated infrastructure.	Ref. 38	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral sites.
	Policies Maps: Five adopted policies maps as well as nine policies inset maps which present mineral allocations.	Ref. 39	Location of mineral sites will be taken into account in the assessment of materials and waste.
	Waste Development Plan Document (DPD) 2007-2026: Policy WCS3: Sustainable Design, Construction and Demolition;	Ref. 40	Policies will be taken into account in the assessment

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy WA1 Strategic Waste Management Site; - Policy WA2 Safeguarding Existing and Allocated Waste Sites; and - Inset Map 1 and 2 within DPD present strategic waste management sites.		of materials and waste including safeguarded mineral and waste sites, and mitigation.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: No relevant policies to materials and waste assessment.	Ref. 41	Despite the local plan not presenting any mineral or waste related policies it has been included for completeness.
	The Local Plan for Buckinghamshire – Draft Vision and Objectives: No relevant policies to materials and waste assessment.	Ref. 42	No new policies for materials and waste identified at this stage. However, the document will be monitored as it progresses through the Local Plan review process.
	Buckinghamshire Minerals and Waste Local Plan 2016-2036 - Policy 4: Allocated Sites for Sand and Gravel Provision; - Policy 10: Waste Prevention and Minimisation in New Development; - Policy 13: Spatial Strategy for Waste Management; - Policy 23: Design and Climate Change; - Policy 26: Safeguarding of Minerals Development and Waste Management Infrastructure; and - Policy 27: Minimising Land Use Conflict.	Ref. 43	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites, and mitigation.
	Minerals and Waste ArcGIS Presents site allocations.	Ref. 44	The identified safeguarded mineral sites will be taken into account in the

Local authority	Relevant local policy	Reference	Relevance to the assessment
			assessment of materials and waste.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: • Policy HQ1: High Quality Development; • Minerals and Waste Strategic Policy MWSP 1 Presumption in Favour of Sustainable Development; • Minerals and Waste Strategic Policy MWSP 2 Climate Change; and • Waste Strategic Policy WSP 5 Including waste management in new built developments.	Ref. 45	Policies will be taken into account in the assessment of materials and waste including mitigation.
	Minerals and Waste Local Plan: Strategic Sites and Policies: • Policy MSP 1 Overall Spatial Strategy for Aggregate Sand and Gravel and Silica Sand; • Policy MSP 4: Safeguarding Concrete Batching, Asphalt and Stone Coating Plants; • Mineral Strategic Policy MSP 10 Strategic Transport and protection of existing railhead facilities; and • Policy WSP2: Strategic Waste Management Sites.	Ref. 46	Policies will be taken into account in the assessment of materials and waste including safeguarded mineral and waste sites.
	Policies map: • Policies maps (nine inset maps in total) present strategic, permitted waste and mineral sites.	Ref. 47	The identified safeguarded mineral sites will be taken into account in the assessment of materials and waste.

Guidance and Standards

21.2.7 Relevant guidance and standards which have been used as part of the scoping process and will also be taken into account as part of the EIA include:

- a. Planning Policy Guidance (PPG) for Minerals (2014) (Ref. 48) and Waste (Ref. 49);
- b. IEMA Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach (Ref. 1);
- c. Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (DoWCoP), v2 (2011) (Ref. 50);
- d. Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (Ref. 51);
- e. Waste Duty of Care Codes of Practice (Ref. 52); and
- f. Department for Environment, Food & Rural Affairs (Defra) Guidance on Applying the Waste Hierarchy (2011) (Ref. 53).

21.3 Consultation

21.3.1 There were no specific issues raised during non-statutory consultation that relate to the scope of the materials and waste assessment.

21.3.2 As part of the EIA process, consultation will be undertaken with the local planning authorities to inform the assessment and mitigation for the Proposed Development.

21.4 Study Area

21.4.1 The study areas for the assessment of impacts related to materials and waste have been defined in line with the IEMA Guidance (Ref. 1), as summarised within **Table 21-3**. Further details of the study areas are set out within sections below.

Table 21-3: Study areas for materials and waste impacts

Materials & Waste Impacts	Study Area Extent
Waste generation	EIA Scoping Boundary
Use of construction and operational materials (key materials only)	
Impact on safeguarded mineral and waste sites	
Non-hazardous and inert waste landfill capacity	Regional
Hazardous waste landfill capacity	National
Availability of key construction materials	Regional, National

EIA Scoping Boundary Study Area

21.4.2 The study area for waste generation and the use of construction and operational materials (key materials only) comprises the EIA Scoping Boundary. An EIA Scoping Boundary has been adopted for the purposes of

this EIA Scoping Report to define the potential extent of land currently assumed to be necessary to construct, operate and maintain the Proposed Development.

- 21.4.3 The study area for the impacts on safeguarded mineral and waste sites is also defined by the EIA Scoping Boundary. Impacts on safeguarded waste sites are not included in the IEMA Guidance, however they are included for completeness and an assessment of impacts on such sites will be considered in the assessment, as appropriate.

Expansive Study Area

- 21.4.4 As outlined in PPG for Waste (Ref. 9) *“The principles of self-sufficiency and proximity (commonly referred to as the ‘proximity principle’) are set out in Article 16 of the Waste Framework Directive (Ref. 2), Local planning authorities are required, under regulation 18 of the Waste (England and Wales) Regulations 2011 (Ref. 5) which transposed the Directive, to have regard to these requirements when exercising their planning functions relating to waste management”*.
- 21.4.5 In addition, *“...though this should be the aim, there is no expectation that each local planning authority should deal solely with its own waste to meet the requirements of the self-sufficiency and proximity principles. Nor does the proximity principle require using the absolute closest facility to the exclusion of all other considerations. There are clearly some wastes which are produced in small quantities for which it would be uneconomic to have a facility in each local authority. Furthermore, there could also be significant economies of scale for local authorities working together to assist with the development of a network of waste management facilities to enable waste to be handled effectively”* (Ref. 49).
- 21.4.6 Local authority administrative boundaries have been used to identify the regions in which the EIA Scoping Boundary sits.
- 21.4.7 Non-hazardous and inert waste management impacts are assessed at a regional level. The regional study area for non-hazardous and inert waste management is defined by the Environment Agency and includes the following sub-regions as outlined in the Environment Agency’s 2023 Waste Summary Tables for England – Version 1 (Ref. 54) which the Proposed Development crosses.
- a. East Midlands (Derbyshire, Leicestershire, Lincolnshire, Northamptonshire and Nottinghamshire);
 - b. West Midlands (Herefordshire, Shropshire, Staffordshire, Warwickshire, West Midlands Met Districts and Worcestershire);
 - c. South East (Berkshire, Buckinghamshire, East Sussex, Hampshire, Isle of Wight, Kent, Oxfordshire, Surrey and West Sussex); and
 - d. East of England (Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk).
- 21.4.8 **Table 21-4** presents a summary of the local, county and regional study areas for non-hazardous and inert waste for the Proposed Development. The study areas for non-hazardous and inert waste management have been defined

based on professional judgement and informed by consideration of the proximity principle.

Table 21-4: Summary of study areas – Materials and Waste

Reference point	Local administrative area	County administrative area	Regional area
Part 1a: Minworth AWTP	• Birmingham City Council	• West Midlands Met • Districts	• West Midlands
Part 1b: Minworth to Atherstone Pipeline	• North Warwickshire Borough Council	• Warwickshire	• West Midlands
Part 2: Works to the Coventry, Oxford and Grand Union Canals	• West Northamptonshire Council; • North Warwickshire Borough Council; • Nuneaton and Bedworth Borough Council; • Rugby Borough Council; • West Northamptonshire Council; • Buckinghamshire Council; • Milton Keynes City Council; • Central Bedfordshire Council; and • Coventry City Council.	• Warwickshire; • Northamptonshire; • Buckinghamshire; and • Bedfordshire.	• East Midlands; • West Midlands; • South East; and • East of England.
Part 3: Daventry and Drayton Reservoirs	• West Northamptonshire Council	• Northamptonshire	• East Midlands
Part 4a: Abstraction, Treatment and Storage	• Buckinghamshire; and • Central Bedfordshire.	• Buckinghamshire; and • Bedfordshire	• South East
Part 4b: Pipeline to an underground storage reservoir near Luton	• Buckinghamshire; • Central Bedfordshire; and • Milton Keynes City Council.	• Buckinghamshire; and • Bedfordshire	• South East

21.4.9 The study area for hazardous waste management is England. The study area is defined based on professional judgement and informed by consideration of the proximity principle.

21.4.10 The proximity principle for hazardous waste in England is outlined in Principle 2 – Infrastructure Provision in the Strategy for Hazardous Waste Management in England (Ref. 55):

“We look to the market for the development of hazardous waste infrastructure, which implements the hierarchy for the management of hazardous waste and meets the needs of the UK to ensure that the country as a whole is self-sufficient in hazardous waste disposal, facilities are put in place for hazardous waste recovery in England, and the proximity principle is met.”

21.4.11 Planning for hazardous waste management is also undertaken at a national level.

21.4.12 The study area for availability of key construction materials (aggregates, asphalt, concrete and steel) is national (United Kingdom (UK) or Great Britain (GB)) and the following four regions; East Midlands, West Midlands, South East and the East of England (dependent on baseline information availability).

21.5 Baseline Conditions

Existing Baseline

21.5.1 This section provides a summary of the baseline conditions in respect of materials and waste.

Availability of Key Construction Materials

21.5.2 At the time of writing, the exact quantities of key construction materials (concrete, aggregate, asphalt and steel) required for the Proposed Development are unknown as the design is in development.

21.5.3 UK, GB and regional data have been used to establish a quantitative national baseline of the consumption for key construction materials.

21.5.4 **Table 21-5** summarises national consumption in 2022 for aggregates, asphalt and concrete, and national consumption in 2023 for steel (the most recent years for which data are available), which are the key construction materials expected to be used during the construction of the Proposed Development. Regional data is also presented in **Table 21-5**.

21.5.5 It is anticipated that the majority of key construction materials would be sourced locally or regionally e.g. concrete, aggregate and asphalt, taking into account the proximity principle and value for money. Other materials such as steel would be sourced at a UK level.

Table 21-5: Availability of key construction materials

Material	National availability (million tonnes, year)	East Midlands availability (million tonnes, year)	West Midlands availability (million tonnes, year)	South East availability (million tonnes, year)	East of England availability (million tonnes, year)	Baseline data year	Data description
Steel	15	Not applicable, steel will be assessed at the national level.				2023	UK's requirement, Steel UK, Key Statistics Guide, Steel requirement May 2024 (Ref. 56)
Crushed rock (million tonnes)	Not applicable, these materials will be assessed at the regional level	30.6	4.5	0.0	0.0	2021	Minerals and mineral products sales in Great Britain (Ref. 57)
Sand and gravel (million tonnes)		6.1	6.9	9.2	10.5		
Ready-mixed concrete (million m ³)		1.3	1.8	2.3	1.2		
Ready-mixed concrete (million tonnes converted from m ³ using a density of 2.4 t/m ³)		3.1	4.3	5.5	2.9		
Asphalt		3.3	1.7	1.7	2.4		

- 21.5.7 Potential recycled contents for the main construction materials are outlined in **Table 21-6**. These “good practice” rates are derived from the Waste Resources Action Plan’s (WRAP) Designing Out Waste Tool for Civil Engineering (Ref. 51).

Table 21-6: Potential recycled content

Material type	Potential recycled content (% by weight)
Concrete	16
Asphalt	25
Aggregates	50
Steel reinforcement	100
Structural steel	60

Safeguarded Mineral and Waste Sites

- 21.5.8 The location of safeguarded mineral and waste sites have been identified for each part of the Proposed Development within (and adjacent to) the EIA Scoping Boundary as set out in **Table 21-7**, more policy detail is provided in **Table 21-8**. The sites are outlined in **Figure 21-1**.

Table 21-7: Safeguarded mineral and waste sites – Summary

Site name
<i>Part 1a: Minworth AWTP</i>
No safeguarded mineral and waste sites.
<i>Part 1b: Minworth to Atherstone Pipeline</i>
Within the boundary of an allocated mineral site (Hams Lane, Lea Marston, site reference HL9) – Warwickshire.
<i>Part 2: Works to the Coventry, Oxford and Grand Union Canals</i>
- Adjacent to existing/former sites near Bermuda (Griff 4 and Griff 5), however this is in the Indicative Non-Working EIA Boundary; - Within the boundary of an existing mineral site (Jees and Boon, site reference J&B_HR) – Warwickshire; - Within the boundary of a “<i>Preventing land use conflict consultation buffer</i>” around waste location WL1 as set out in Inset Map 7 – Northamptonshire; and - Within the boundary of Strategic waste site (Land at Clipstone Brook) – Central Bedfordshire.
<i>Part 3: Daventry and Drayton Reservoirs</i>
Within the boundary of a “<i>Preventing land use conflict consultation buffer</i>” around waste location WL1 as set out in Inset Map 7 – Northamptonshire.
<i>Part 4a: Abstraction, Treatment and Storage</i>
No safeguarded mineral and waste sites.
<i>Part 4b: Pipelines to the ‘Underground Storage Reservoir near Luton’</i>
No safeguarded mineral and waste sites.

Table 21-8: Safeguarded mineral and waste sites – Detailed review

Local authority	Relevant spatial policy	Policy map	Safeguarded mineral and waste sites
Birmingham City Council	Adopted Birmingham Development Plan 2031 (Ref. 15):	Birmingham Development	Policy map does not show safeguarded mineral and waste sites however consideration of Core Employment Areas is required as part of policy

Local authority	Relevant spatial policy	Policy map	Safeguarded mineral and waste sites
	- TP14 New and Existing Waste Facilities; and - TP15 Location of Waste Management Facilities: - The Tyseley Environmental Enterprise Area which has potential to accommodate new waste and sustainable energy technologies, including recycling, Combined Heat and Power and waste recovery; - Other industrial areas including the Core Employment Areas identified on the Policies Map; - Sites currently or previously in use as waste management facilities; and - Appropriate sites adjacent to existing waste management facilities. - TP16 Minerals - Minerals infrastructure.	Plan Policies Map (Ref. 16)	TP15. No Core Employment Areas were identified within Part 1a of the Proposed Development. Existing waste sites are outlined in Table 21-9. Minerals infrastructure, including sites for concrete batching, the manufacture of coated materials, other concrete products (policy TP16) are not marked on the policies map.
North Warwickshire Borough Council	Warwickshire Minerals Local Plan (2018-2032) (Ref. 20): - Policy S0 - Overarching Policy - Mineral Sites to be Allocated; - Policy MCS 5 - Safeguarding of Minerals and Minerals Infrastructure; and - Policy DM10 - Mineral Safeguarding.	Minerals Local Plan Policy Map (Ref. 21)	Part 1b of the Proposed Development is within the boundary of an allocated mineral site (Hams Lane, Lea Marston, site reference HL9). Part 2 of the Proposed Development is within the boundary of an existing mineral site (Jees and Boon, site reference J&B_HR).
	Warwickshire Waste Core Strategy Adopted Local Plan (2013-2028) (Ref. 22):	Figure 3.1 within the local plan (Ref. 22)	A check has been completed against Figure 3.1 within the local plan. There are no safeguarded

Local authority	Relevant spatial policy	Policy map	Safeguarded mineral and waste sites
	Policy CS8 - Safeguarding of waste management sites.		mineral and waste sites in EIA Scoping Boundary. Existing waste sites are outlined in Table 21-9.
Nuneaton and Bedworth Borough Council	Warwickshire Minerals Local Plan (2018-2032) (Ref. 20): - Policy S0 - Overarching Policy - Mineral Sites to be Allocated; - Policy MCS 5 - Safeguarding of Minerals and Minerals Infrastructure; and - Policy DM10 - Mineral Safeguarding.	Minerals Local Plan Policy Map (Ref. 21)	The map shows that Part 2 of the Proposed Development is adjacent to existing/former sites near Bermuda (Griff 4 and Griff 5), however this is in an Indicative Non-Working EIA Boundary.
	Warwickshire Waste Core Strategy Adopted Local Plan (2013-2028) (Ref. 22): Policy CS8 - Safeguarding of waste management sites.	Figure 3.1 within local plan (Ref. 22)	A check has been completed against Figure 3.1 within the local plan within the local plan. There are no safeguarded mineral and waste sites in the Proposed Development. Existing waste sites are outlined in Table 21-9 .
Coventry City Council	Coventry City Council Local Plan 2011-2031 (Ref. 26): - Policy EM8: Waste Management; and - Policy EM9: Safeguarding Mineral Resources.	Coventry Local Plan Policy Map (Ref. 27)	All existing waste sites are protected. Existing waste sites are outlined in Table 21-9. Policy map does not show safeguarded mineral and waste sites.
Rugby Borough Council	Warwickshire Minerals Local Plan (2018-2032) (Ref. 20): - Policy S0 - Overarching Policy - Mineral Sites to be Allocated; - Policy MCS 5 - Safeguarding of Minerals and Minerals Infrastructure; and - Policy DM10 - Mineral Safeguarding.	Minerals Local Plan Policy Map (Ref. 21)	Part 2 of the Proposed Development does not intersect with any safeguarded mineral or waste sites.

Local authority	Relevant spatial policy	Policy map	Safeguarded mineral and waste sites
	Warwickshire Waste Core Strategy Adopted Local Plan (2013-2028) (Ref. 22): Policy CS8 - Safeguarding of waste management sites.	Figure 3.1 within local plan (Ref. 22)	A check has been completed against Figure 3.1 within the local plan within the local plan. There are no safeguarded mineral and waste sites in the EIA Scoping Boundary. Existing waste sites are outlined in Table 21-9 .
West Northamptonshire Council	Northamptonshire Minerals and Waste Local Plan (Ref. 33): • Policy 4 - Sites for the provision of sand and gravel in policy map as Mineral locations - Sites for the provision of sand and gravel; • Policy 5 - Sites for the provision of crushed rock in policy map as Mineral locations - sites for the provision of crushed rock; • Policy 7 - Sites for the provision of building and roofing stone in policy map as Mineral locations - sites for the provision of building and roofing stone; • Policy 13 - Locations for waste management facilities in policy map as - sites for integrated waste management facilities; and • Policy 30 Preventing land use conflict in policy map as - Preventing land use conflict consultation buffer Policy 30 minerals and waste allocations.	Inset Map 7 (Ref. 35)	Part 2 and Part 3 of the Proposed Development is within a “Preventing land use conflict consultation buffer” around waste location WL1 as set out in Inset Map 7. Part 2 and Part 3 of the Proposed Development does not intersect any mineral sites or locations for waste.
Milton Keynes City Council	Plan: MK 2016 - 2031 Adopted March 2019 (Ref. 36)	Plan:MK 2016 – 2031 Policy Map (Ref. 36)	Mineral allocations (building stone, sand and gravel) are outlined on the Plan: MK 2016-2031 policies map but none are within the vicinity of

Local authority	Relevant spatial policy	Policy map	Safeguarded mineral and waste sites
			Part 2 and Part 4b of the Proposed Development.
	Minerals Local Plan (MLP) July 2017 (Ref. 38): - Policy 3: Site-specific allocations for the extraction of sand and gravel; - Policy 4: Site-specific allocations for the extraction of building stone; and - Policy 19: Safeguarding mineral-related developments and associated infrastructure.	Minerals Local Plan Policy - Map 4 (Ref. 39)	There are no sand and gravel quarries, recycling aggregate processing facilities or building stone quarries in the vicinity of Part 2 and Part 4b of the Proposed Development in relation to Policy 3, 4 and 19 of the MLP.
	Waste Development Plan Document (DPD) 2007 – 2026 (Ref. 40): - Policy WA1 Strategic Waste Management Site; and - Policy WA2 Safeguarding Existing and Allocated Waste Sites.	Inset W1 and W2 within DPD (Ref. 40)	Strategic waste management sites and reserve strategic waste sites are presented on the proposal map, there are none within the vicinity of Part 2 and Part 4b of the Proposed Development.
Buckinghamshire Council	Buckinghamshire Minerals and Waste Local Plan 2016-2036 (Ref. 43): - Policy 4: Allocated Sites for Sand and Gravel Provision; - Policy 13: Spatial Strategy for Waste Management; - Policy 26: Safeguarding of Minerals Development and Waste Management Infrastructure; and - Policy 27: Minimising Land Use Conflict.	Buckingham Council Minerals and Waste Arc GIS (Ref. 44)	There are no allocated mineral sites (policy 4) in the vicinity of Part 2, Part 4a and Part 4b of the Proposed Development. There are no areas of focus for waste management (policy 13) in the vicinity of Part 2, Part 4a and Part 4b of the Proposed Development. All existing mineral and waste sites are safeguarded. Mineral and waste - minerals commitments are marked on the policies map.

Local authority	Relevant spatial policy	Policy map	Safeguarded mineral and waste sites
			There are none within the vicinity of Part 2, Part 4a and Part 4b of the Proposed Development. Policy 27 is not marked on the online policies map. A 300m buffer applies to all existing mineral and waste sites.
Central Bedfordshire Council	Minerals and Waste Local Plan: Strategic Sites and Policies (Ref. 46): • Mineral strategic policy MSP 1: Overall Spatial Strategy for Aggregate Sand and Gravel and Silica Sand; • Policy MSP 4: Safeguarding Concrete Batching, Asphalt and Stone Coating Plants; • Mineral Strategic Policy MSP 10 Strategic Transport and protection of existing railhead facilities; and • Waste Strategic Policy WSP 2 - Strategic Waste Management Sites.	Inset Map 4 and 8 (Ref. 47)	There are no aggregate railhead facility, permitted waste sites, permitted mineral processing plants or possible location of processing plant in the vicinity of Part 2 and Part 4b. Part 2 of the Proposed Development is in the boundary of a safeguarded waste site (Strategic Waste Site, Land at Clipstone Brook).

Permitted waste sites and waste site applications

21.5.9 The location of permitted waste sites within the EIA Scoping Boundary was identified for each part of the Proposed Development, as set out in **Table 21-9**.

21.5.10 No waste site applications have been identified within the EIA Scoping Boundary.

Table 21-9: Permitted waste sites (Ref. 58)

Site name	Permit reference	Site address	Licence Type	Licenced holder	Licence Issued	Status
Part 1a: Minworth AWTP						
Minworth - Hazardous Waste Landfill Site	EA/EPR/RP3391FD	Kingsbury Road, Sutton Coldfield, Minworth, West Midlands, B76 9DP	A05 – landfill taking non-biodegradable wastes	Severn Trent Water Limited	15 May 1994	Expired
Part 1b: Minworth to Atherstone Pipeline						
No permitted waste sites within Part 1b EIA Scoping Boundary.						
Part 2: Works to the Coventry, Oxford and Grand Union Canals						
No permitted waste sites within Part 2 EIA Scoping Boundary						
Part 3: Daventry and Drayton Reservoirs						
No permitted waste sites within Part 3 EIA Scoping Boundary.						
Part 4a: Abstraction, Treatment and Storage						
No permitted waste sites within Part 4a EIA Scoping Boundary.						
Part 4b: Pipelines to the 'Underground Storage Reservoir near Luton'						
G Moore Haulage Ltd/Hunters Sand Ltd – Fox & Hounds Sandpit	EA/EPR/UP3690NF	Heath & Reach, Bedfordshire, MK17 9HG	A06 – landfill taking other wastes	G Moore Haulage Limited	21 November 1988	Expired

Historic and Permitted Landfills

- 21.5.11 Permitted landfills which sit within the EIA Scoping Boundary of each part of the Proposed Development are detailed in **Table 21-10** as summarised from the Environment Agency's Permitted Waste Sites – Authorised Landfill Site Boundaries spatial data (Ref. 61).
- 21.5.12 Historic landfills are potentially relevant to this assessment since excavations in historic landfill can give rise to waste that would require management. The Environment Agency's Historic Landfill Sites spatial data (Ref. 62) identifies 28 historic landfills in the EIA Scoping Boundary of the Proposed Development. Additional information on these landfill sites is presented in **Table 21-11**.

Table 21-10: Permitted landfills (Ref. 61)

Site name	Permit reference	Site address	Licence holder	Licence issued	Status
Part 1a: Minworth AWTP					
Minworth Sewage Treatment Works, Minworth Landfill	EPR/BV45/41IR	Kingsbury Road, Sutton Coldfield, West Midlands, B76 9DP	Severn Trent Water Limited	3 March 2022	Effective
Part 1b: Minworth to Atherstone Pipeline					
No permitted landfills within Part 1b EIA Scoping Boundary.					
Part 2: Works to the Coventry, Oxford and Grand Union Canals (Indicative Work Area only)					
Judkins Landfill Phase 3	EPR/JP3033YQ	Nuneaton, West Midlands, CV10 0JQ	Crown Waste Limited	10 November 2017	Effective
Part 3: Daventry and Drayton Reservoirs					
No permitted landfills within Part 3 EIA Scoping Boundary.					
Part 4a: Abstraction, Treatment and Storage					
No permitted landfills within Part 4a EIA Scoping Boundary.					
Part 4b: Pipelines to the 'Underground Reservoir near Luton'					
No permitted landfills within Part 4b EIA Scoping Boundary.					

Table 21-11: Historic landfills (Ref. 62)

Site name	Site address	Licence holder	Licence issued	Licence surrendered	Waste type
Part 1a: Minworth AWTP					
No historic landfills within Part 1a EIA Scoping Boundary.					
Part 1b: Minworth to Atherstone Pipeline					

Site name	Site address	Licence holder	Licence issued	Licence surrendered	Waste type
Outwoods Golf Club	Coleshill Road, Atherstone, Warwickshire	No information available	No information available	No information available	No available information
Coton Hall Quarry No.2	Coton Road, Whitacre Heath, Warwickshire	Pioneer Aggregates (UK) Limited	23 February 1989	15 March 1993	Inert
CEGB Site No.2	Haunch Lane, Lea Marston, Sutton Coldfield, West Midlands	Central Electricity Generating Board	10 May 1977	01 October 1988	Inert
Land West of Hams Lane	Lea Marston, Sutton Coldfield, West Midlands	Central Electricity Generating Board	10 May 1977	01 October 1988	Inert
Birmingham Road	Whitacre Heath, Nether Whitacre, Coleshill, Solihull, West Midlands	Mr John Fox	13 June 1991	30 September 1992	Inert
Part 2: Works to the Coventry, Oxford and Grand Union Canals (Indicative Work Area only)					
Stoneleigh Quarry	Mancetter, Warwickshire	No information available	No available information	No available information	Commercial
Dodmoor Farm	Dodford, Near Weedon, Northamptonshire	No information available	No available information	31 December 1988	Industrial, household.
Dodford	Read of Dodmoor Farm, Weedon, Northamptonshire	Mixconcrete House, Little Billing, Northampton	18 September 1979	09 February 1981	Industrial, commercial, household

Site name	Site address	Licence holder	Licence issued	Licence surrendered	Waste type
Dodmoor Farm	Weedon, Northamptonshire	B M Summers Limited	22 November 1982	05 April 1983	No information available
Blackhorse Road	Hawkesbury, Bedworth, Warwickshire	No information available	No information available	No information available	Industrial
Rothersthorpe	Milton Malsor, Northamptonshire	Mixconcrete Aggregates Limited	06 August 1980	No available information	No information available
Milton Sand Pit	Milton Malsor and Gayton	Mixconcrete Holdings	02 November 1979	No available information	Liquid sludge
Gayton Landfill Site	Milton Malsor Road, Gayton	No available information	No available information	No available information	Industrial, commercial, household
All Oaks Lane	Cathiron Lane, Near Brinklow, Rugby, Warwickshire	Messrs John Lockwood Construction Service	26 September 1983	30 March 1993	No available information
Hawkesbury Landfill Site	Hawkesbury Lane, Coventry, Nuneaton, Warwickshire	J and H B Jackson Limited - Lias Quarries Limited	18 December 1979	06 April 1993	Industrial
Hawkesbury Power Station	Aldermans Green Road, Nuneaton, Warwickshire	Kelrow Construction	22 October 1984	31 December 1994	No available information
Hawkesbury Power Station	Aldermans Green Road, Nuneaton, Warwickshire	Coventry City Council	No available information	No available information	Industrial

Site name	Site address	Licence holder	Licence issued	Licence surrendered	Waste type
Hawkesbury Landfill	Hawkesbury Lane, Near Coventry, Nuneaton, Warwickshire	Lias Quarries Limited	18 May 1987	No available information	Industrial
Worthington Farm	Purley Chase Lane, Mancetter, Atherstone, Warwickshire	No available information	No available information	No available information	No available information
Stoneleigh Quarry Farm	Quarry Lane, Macetter, Atherstone, Warwickshire	Motorway Landscapes Limited	30 December 1987	No available information	No available information
Vernons Lane Playing Fields	Vernons Road, Nuneaton, Warwickshire	No available information	No available information	No available information	No available information
Grovebury Quarry	Grovebury Road, Near Leighton Buzzard Bypass, Leighton Buzzard	No available information	No available information	No available information	Inert
Part 3: Daventry and Drayton Reservoirs					
Ashby Road	Daventry, Northamptonshire	No information available	No information available	No available information	Inert
Daventry Sewage Works	Northern Way, Daventry, Northamptonshire	No information available	No available information	No available information	Inert
Part 4a: Abstraction, Treatment and Storage					

Site name	Site address	Licence holder	Licence issued	Licence surrendered	Waste type
No historic landfills within Part 4a EIA Scoping Boundary.					
<i>Part 4b: Pipelines to the 'Underground Reservoir near Luton'</i>					
Shepherds Farm	Tring Road, Wellhead	No available information	No available information	No available information	No available information
Sand Quarry	Watling Street, Heath and Reach, Bedfordshire	Jones Sand (Leighton Buzzard) Limited	29 November 1977	No available information	Inert, industrial
Fox and Hounds Sandpit	Heath and Reach, Bedfordshire	Hunters Sand Limited	21 November 1988	20 February 2000	Inert

Capacity of Waste Management Facilities

Landfill Capacity

21.5.13 Baseline information consists of current landfill capacity in the East Midlands, West Midlands, South East and the East of England for non-hazardous waste and England for hazardous waste, as outlined in the Environment Agency's 2023 Waste Summary Tables for England – Version 1 (Ref. 54) and **Table 21-12**.

21.5.14 For hazardous waste, total merchant landfill capacity in England at the end of 2023 was approximately 9.7 million m³. Hazardous restricted sites are not included since that capacity may not be available to the Proposed Development. Restricted landfills only accept waste from a restricted set of sources and producers, commonly the site operator, e.g. a manufacturing site.

Table 21-12: Landfill Capacity (2022) in East Midlands, West Midlands, East of England, South East and England

Landfill Type	East Midlands Landfill Capacity (000m³)	West Midlands Landfill Capacity (000m³)	East of England Landfill Capacity (000m³)	South East Landfill Capacity (000m³)	England Landfill Capacity (000m³)
Hazardous Merchant	Not applicable, hazardous waste assessed at the England level.				9,680
Non-hazardous with Stable Non-reactive hazardous waste (SNRHW) cell	16,069	4,362	3,055	10,014	Not applicable, non-hazardous and inert waste assessed at the regional level
Non-hazardous	14,700	23,346	25,110	16,644	
Inert	18,917	6,737	30,522	19,321	
Total non-hazardous and inert	49,686	34,445	58,688	45,980	

Waste Management Infrastructure

21.5.15 Capacity of other types of waste infrastructure is publicly available, e.g., under the Environmental Permitting Regulations – Waste Sites (Ref. 58), however the permitted capacity is not necessarily representative of the actual operational capacity of the infrastructure. Therefore, input data are collated for the study areas from the Environment Agency's Waste Data Interrogator 2023 – Waste Received (Excel) – Version 1 (Ref. 54) and presented in **Table 21-13**. Inputs are not totalled since the double counting of waste in the Waste Data Interrogator cannot be discounted.

Table 21-13: Summary of Waste Inputs by Facility 2023

Facility Type	East Midlands (tonnes received)	West Midlands (tonnes received)	South East (tonnes received)	East of England (tonnes received)
Landfill	3,933,086	4,695,215	8,850,149	7,775,684
Metal Recycling Site	806,118	1,812,344	888,659	3,853,363
On/In Land	282,857	2,677,016	1,971,458	1,731,774
Transfer	4,477,926	4,280,166	6,260,869	5,075,056
Treatment	7,709,968	9,816,642	12,569,986	11,741,551
Use of Waste	-	38,772	347	-
Combustion	196,422	-	325,262	164,181
Incineration	1,333,480	2,054,530	3,736,982	1,561,925
Mining	13,209	-	-	105,390
Storage	242,214	339,062	455,028	314,351
Processing	178,916	319,457	1,130,601	472,222
Associated Process	1,814	216,187	-	2,725

21.5.16 The IEMA Guidance (Ref. 1) (page 14) “*does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources.*” Therefore, a full list of waste management infrastructure is not included in the baseline.

Targets

21.5.17 The national target for recovery of construction and demolition waste is 70% by weight, as set out in the Waste Framework Directive (Ref. 2) and the Waste Management Plan for England (Ref. 11). The target specifically excludes naturally occurring materials with EWC Code 17 05 04 (17 05 04 soil and stones other than those mentioned in 17 05 03* (soils and stone containing dangerous substances)). Recovery is deemed to include reuse, recycling and other recovery, e.g. energy recovery.

21.5.18 A good practice landfill diversion target of 90% has been achieved and exceeded by major UK developments as outlined in the IEMA Guidance (Ref. 1). In 2020, the UK generated 59.1 million tonnes of non-hazardous C&D waste, of which 54.8 million tonnes were recovered. This represents a recovery rate of 92.6% (Ref. 59).

21.5.19 Standard, good and best practice recovery rates by material are provided by WRAP (Ref. 60). Recovery rates for key construction materials and other construction wastes relevant to the Proposed Development are provided in **Table 21-14**.

Table 21-14: Standard, Good and Best Practice Recovery Rates by Material

Material	Standard practice recovery (%)	Good practice recovery (%)	Best practice recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information cannot be 100% since some hazardous waste (e.g. asbestos must be landfilled)	

Future Baseline

- 21.5.20 There is no publicly available information on any potential long-term changes to the national and regional demand by the time of construction of the Proposed Development. Construction material demand such as ready mixed concrete is closely aligned to both the quantity of construction taking place and the general economy; therefore, it is deemed inappropriate to forecast future demand as the demand is unlikely to be linear. It is therefore not possible to set a future baseline for resources. Therefore, future consumption is assumed to be the same as the current baseline.
- 21.5.21 There is no publicly available information regarding any potential changes to landfill capacity by the time of the Proposed Development's construction.
- 21.5.22 Due to the cyclic nature of inert landfill capacity (e.g. landfill capacity decreasing, and then new sites or landfill cells being opened with landfill capacity increasing), it is not realistic to forecast future landfill capacity. Therefore, inert and hazardous landfill capacity is assumed to remain the same as the current baseline as outlined in **Table 21-12**.
- 21.5.23 For non-hazardous waste and hazardous waste, using the current rate of decline of landfill capacity and forecasting into the future would lead to the inevitable conclusion that there would be no void space remaining. However, this is not a credible scenario as if there is still a need for landfill, then the Waste Planning Authorities (WPA) will need to consent new landfill capacity to replace that which has been used up. Therefore, non-hazardous and hazardous landfill capacity is assumed to remain the same as the current baseline, as outlined in **Table 21-12**.

21.6 Potential Effects

Construction Phase

21.6.1 The scoping of potential effects from the Proposed Development during the construction phase is presented within **Table 21-15** below.

Table 21-15: Potential effects during the construction phase – Materials and Waste

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Changes in demand for materials	In	All	The quantities and type of construction materials to be used in construction are not yet known at this stage. As such on a precautionary basis, impact on landfill capacity has been scoped into the EIA.
Waste arising from extraction, processing and manufacture of construction components and products	Out	All	This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and therefore outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured.
Other environmental impacts associated with the management of waste from the Proposed Development e.g., on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or	Out	All	These are addressed separately in other relevant chapters of this EIA Scoping Report (refer to Chapter 9: Air Quality and Odour , Chapter 14: Ground Conditions , Chapter 18: Noise and Vibration , Chapter 20: Traffic and Transport and Chapter 22: Water

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
off-site transport of materials and waste			Environment and Flood Risk).
Changes in available landfill void capacity (for both hazardous and non-hazardous waste)	In	All	The quantities and type of waste to be generated in construction is not yet known. As such on a precautionary basis, impact on landfill capacity has been scoped into the EIA.
Changes to safeguarded mineral and waste sites	In	Parts 1b, 2 and 3	Impacts on safeguarded waste sites are not included in the IEMA Guidance, however they are included for completeness and an assessment of impacts on such sites will be considered in the EIA.
	Out	Parts 1a, 4a and 4b	As there are no safeguarded mineral and waste sites in those Parts.

Operational Phase

21.6.2 The scoping of potential effects from the Proposed Development during the operational phase is presented within **Table 21-16** below.

Table 21-16: Potential effects during the operational phase – Materials and Waste

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Changes in availability of materials	Out	All	Forecast effects are (using professional judgement on the likely type and volume of materials) considered negligible in relation to the scale and nature of the proposed development.
Other environmental impacts associated with the management of waste from the Proposed Development (e.g. on water resources, air quality, noise or traffic	Out	All	These are addressed separately in other relevant chapters of this EIA Scoping Report (refer to Chapter 9: Air Quality and Odour, Chapter 14: Ground Conditions,

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste)			Chapter 18: Noise and Vibration, Chapter 20: Traffic and Transport and Chapter 22: Water Environment and Flood Risk of this EIA Scoping Report).
Changes in available landfill void capacity	Out	Parts 1b, 2, 3 and 4b	Pipelines, the canal network and reservoirs will require minimal maintenance during operation and will generate negligible volumes of waste in relation to the scale and nature of the proposed development.
	In	Parts 1a and 4a	During operation the Minworth AWTP will generate waste. The quantities and type of waste to be generated in operation is not yet known.
Changes to safeguarded mineral and waste sites	Out	All	Changes to safeguarded minerals and waste sites are not anticipated during operation and are considered during the construction phase only.

21.7 Approach to Assessment

Assessment Methodology

- 21.7.1 This section outlines the methodology that will be employed for assessing the likely significant effects associated with materials and waste. The IEMA Guidance offers two methods for the assessment of waste. Method W1 – void capacity – has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects. The magnitude of impact from waste is assessed by determining the percentage of the remaining landfill void capacity that will be depleted by waste produced during the construction and operation
- 21.7.2 Method W2 – landfill diversion – is a simpler approach and deemed to be less robust than Method W1. Developments are compared to a good practice landfill diversion rate of 90% (as achieved and exceeded by major UK developments and organisations).

21.7.3 The sensitive receptors for the assessment of materials and waste impacts are:

- a. Materials, national consumption of key construction materials – as outlined in the IEMA Guidance (Ref. 1):

“Materials are, in their own right, sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary material) long-term availability; this results in the depletion of natural resources and adversely impacts the environment.”;

- b. Landfill void capacity in the expansive study area of the East Midlands, West Midlands, South East and East of England (non-hazardous landfill void capacity) and England (hazardous landfill void capacity) – as defined in the IEMA Guidance (Ref. 1):

“Landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing and develop new facilities. This requires the depletion of natural and other resources which, in turn, adversely impacts the environment.”; and

- c. Safeguarded mineral and waste sites. As stated in paragraph 21.5.16, the IEMA Guidance (Ref. 1):

“...does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources.”

21.7.4 The assessment of materials and waste will consider the following:

- a. Waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- b. Facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a license, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves;
- c. As part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and
- d. Minerals Planning Authorities (MPAs) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

Methodology for Determining Effects

21.7.5 The effects on materials and waste, and safeguard mineral and waste receptors will be assessed through the following:

- a. Materials:

- i. Establishing the baseline for national and regional consumption of key construction materials by weight;
 - ii. Assessing the sensitivity of materials as related to the availability and types of materials to be consumed by the Proposed Development in construction;
 - iii. Establishing the quantities of key construction materials required for the construction of the Proposed Development; and
 - iv. Comparing the total quantities of key construction materials with the most recent national demand (utilising a percentage approach).
- b. Waste:
 - i. Establishing the baseline landfill void capacity in the expansive study areas;
 - ii. Assessing the sensitivity of landfill void capacity;
 - iii. Establishing the quantities of waste to be generated across the lifecycle of the Proposed Development; and
 - iv. Comparing the total waste arising from the Proposed Development against the landfill void capacity (using a percentage approach) assuming a worst case that waste goes to landfill.
- c. Safeguarded mineral and waste sites:
 - i. Considering whether there is the potential to adversely and substantially impact access to one or more allocated mineral and waste site (in their entity), placing their future use at risk.

Assessment Criteria

Sensitivity of Receptors

- 21.7.6 The sensitivity of materials relates to the availability and type of construction material to be consumed by the Proposed Development. The IEMA Guidance criteria described within **Table 21-17** will be used to determine the sensitivity of materials.

Table 21-17: Materials Receptor Sensitivity

Effects	Criteria for materials receptor sensitivity
Negligible	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock. <i>And/or</i> are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*
Low	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock.

Effects	Criteria for materials receptor sensitivity
	<i>And/or</i> are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock. <i>And/or</i> are available comprising some sustainable features and benefits compared to industry-standard materials.
High	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock. <i>And/or</i> Comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	On balance, the key materials required for the construction of the Proposed Development are forecast are known to be insufficient in terms of production, supply and/or stock. <i>And/or</i> Comprise no sustainable features and benefits compared to industry-standard materials.
* <i>Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.</i>	

21.7.7 The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development. As outlined in the IEMA Guidance (Ref. 1) “*landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste*”. The sensitivity of landfill capacity is assessed based on a review of historic landfill void capacity trends where available and information from relevant policy documents.

21.7.8 The criteria described within **Table 21-18** and **Table 21-19** will be used to determine the sensitivity of landfill capacity.

Table 21-18: Inert and non-hazardous landfill capacity sensitivity

Effects	Criteria for inert and non-hazardous landfill capacity
Negligible	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity expected to remain unchanged, or is expected to increase through a committed change in capacity.

Effects	Criteria for inert and non-hazardous landfill capacity
Low	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce minimally by <1% as a result of wastes forecast.
Medium	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce noticeably by 1-5% as a result of wastes forecast.
High	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce considerably: by 6-10% as a result of wastes forecast.
Very High	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity: • is expected to reduce very considerably (by >10%); • is expected to end during construction or operation; • is already known to be unavailable; or, • would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 21-19: Hazardous landfill capacity sensitivity

Effect	Criteria for hazardous landfill capacity sensitivity
Negligible	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is expected to reduce minimally by <0.1% as a result of wastes forecast.
Medium	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is: expected to reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is

Effect	Criteria for hazardous landfill capacity sensitivity
	expected to reduce considerably by 0.5-1% as a result of wastes forecast.
Very High	Across the relevant phase of the Proposed Development, the baseline/future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity: • is expected to reduce very considerably (by >1%); • is expected to end during construction or operation; • is already known to be unavailable, or; • would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude of Impacts

- 21.7.9 The magnitude of impact describes the degree of variation from the baseline conditions as result of the Proposed Development. The methodology for assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of construction materials use on the baseline national demand from the construction of the Proposed Development. The criteria used to assess the magnitude of impact for materials are provided within **Table 21-20**.

Table 21-20: Materials Magnitude of Impact

Effects	Criteria for materials magnitude of impacts
No change	Consumption of no materials is required.
Negligible	Consumption of no individual material type is equal to or greater than 1% by volume of the national* baseline availability.
Minor	Consumption of one or more materials is between 1-5% by volume of the national* baseline availability. And/or The development has the potential to adversely and substantially impact access to one or more allocated mineral site (in their entity), placing their future use at risk.
Moderate	Consumption of one or more materials is between 6-10% by volume of the national* baseline availability. And/or One allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.
Major	Consumption of one or more materials is >10% by volume of the national* baseline availability. And/or More than one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.
<i>*a national baseline is used in the absence of regional construction material consumption data.</i>	

21.7.10 The methodology for assessing the magnitude of impact for waste comprises a percentage-based approach that determines the influence of waste generation from the construction Proposed Development on the baseline landfill capacity. The criteria used to assess the magnitude of impact for waste are provided within **Table 21-21** and **Table 21-22**.

Table 21-21: Inert and Non-hazardous Waste Magnitude of Impact

Effects	Criteria for waste magnitude of impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by <1%.
Minor	Waste generated by the Proposed Development will reduce expansive study area landfill capacity* baseline by 1-5%.
Moderate	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by 6-10%.
Major	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by >10%.
<i>*forecast as the worst-case scenario, during a defined construction and/or operational phase.</i>	

Table 21-22: Hazardous Waste Management Magnitude of Impact

Effects	Criteria for waste magnitude of impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by <0.1%.
Minor	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by <0.1-0.5%.
Moderate	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by 0.5-1%.
Major	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by >1%.
<i>*forecast as the worst-case scenario, during a defined construction and/or operational phase.</i>	

Effect Significance

21.7.11 **Table 21-23** describes the effect thresholds used in determining the effects. Neutral and slight effects are considered to be not significant, moderate, large of very large effects are considered to be significant.

Table 21-23: Effect Thresholds

		Magnitude of Impact				
		No change	Negligible	Minor	Moderate	Major
Sensitivity of Receptor	Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or Slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Assumptions, Limitations, and Uncertainties

21.7.12 The following assumptions and limitations have been identified in relation to material and waste:

- a. Waste arising and material use from extraction, processing and manufacture of construction components and products has been scoped out of this assessment. This assumes that these products and materials are being produced in manufacturing facilities including quarries with their own waste management plans, planning and permitting permissions, facilities, and supply chains, which are potentially in different regions of England, the UK or the world, and therefore outside of the geographical scope of this assessment;
- b. Other environmental impacts associated with the management of waste from the Proposed Development e.g., on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste are addressed separately in other relevant chapters; and
- c. The material and waste scoping has been undertaken on the basis of information available at the time of the writing.

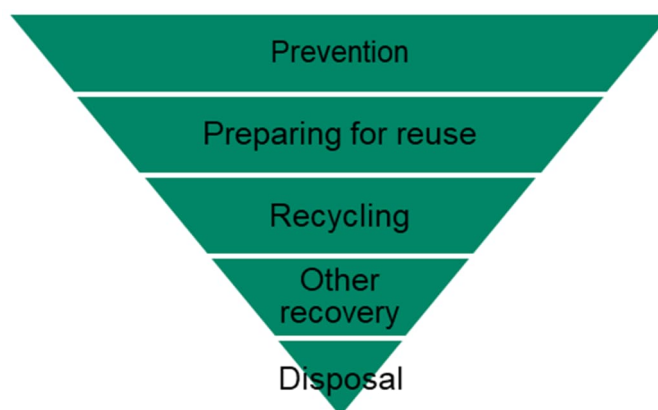
21.8 Approach to Mitigation

21.8.1 The Proposed Development will prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy (**Plate 21-1**).

21.8.2 The following mitigation measures will be considered and implemented where applicable during the design phases and subsequent construction work:

- a. Design for reuse and recovery: identifying, securing and using materials that already exist on site, or can be sourced from other projects;
- b. Design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content;
- c. Design for off-site construction: maximising the use of pre-fabricated structure and components, encouraging a process of assembly rather than construction;
- d. Design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how deconstructability and demountability of elements can be maximised at end of first life;
- e. Design for waste and material efficient procurement: identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard; and
- f. Engineering plan configurations and layouts that show how the most effective use of materials and arisings can be achieved.

Plate 21-1: The Waste Hierarchy from Defra's Guidance on Applying the Waste Hierarchy, recreated by AECOM



- 21.8.3 The construction of the Proposed Development would be subject to measures and procedures defined within an Outline Code of Construction Practice (OCoCP) to be submitted with the application for development consent. The OCoCP would include the implementation of industry standard practice and control measures for environmental impacts arising during construction. An Outline Site Waste Management Plan (OSWMP) will also be submitted with the application for development consent. The construction contractor will use the OSWMP document to produce their SWMP prior to works commencing on site.
- 21.8.4 Excavated material will be managed in accordance with the appropriate exemption and/or environmental permit or if applicable a Materials Management Plan (MMP) will be developed under the CL:AIRE Definition of Waste: Development Industry Code of Practice (Ref. 50) by the construction contractor. This will support the reuse of excavated materials, minimise off-site disposal; and to demonstrate the necessary lines of evidence to support

the proper reuse/off-site disposal of materials and ensure compliance with regulatory guidance.

- 21.8.5 Embedded measures will be considered prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice, i.e. do not take account of such measures even though they are likely to be standard practice (tertiary mitigation) and/or form part of the design of the Proposed Development (mitigation by design). These will then be followed through the assessment to ensure that realistic likely environmental effects are identified. Where likely significant adverse effects are identified after considering these embedded measures, additional mitigation will be considered, developed and proposed, where possible.
- 21.8.6 All mitigation measures will be described within the ES with the rationale for their inclusion clearly stated.

21.9 References

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- Ref. 3 Environmental Protection Act 1990 (as amended). Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> [Accessed 07/02/2025].
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- Ref. 5 The Waste (England and Wales) Regulations 2011 (as amended). Available at: <https://www.legislation.gov.uk/uksi/2011/988/contents> [Accessed 07/02/2025].
- Ref. 6 The Environmental Permitting Regulations (England and Wales) 2016 (as amended). Available at: <https://www.legislation.gov.uk/uksi/2016/1154/contents> [Accessed 07/02/2025].
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- Ref. 11 Department for Environment, Food & Rural Affairs (Defra) (2021). The Waste Management Plan for England. Available at: <https://www.gov.uk/government/publications/waste-management-plan-for-england-2021> [Accessed 07/02/2025].

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Chapter 22: Water Environment and Flood Risk

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22. Water Environment and Flood Risk

22.1 Introduction

22.1.1 This chapter sets out the scope and methodology for the assessment of the potential significant effects arising from the construction and operation of the Proposed Development on the water environment and flood risk.

22.1.2 The aspects of the water environment considered in this chapter include:

- a. The hydrology, geomorphology, and quality of surface water resources;
- b. The quantity and quality of groundwater resources;
- c. Users of surface and groundwater resources such as abstractors;
- d. Surface and groundwater-dependent terrestrial ecosystems and designated sites; and
- e. Flood risk to and from the Proposed Development.

22.1.3 The following water related aspects are covered by other chapters:

- a. Aquatic ecology including invasive non-native species (INNS) (**Chapter 12: Ecology – Aquatic**); and
- b. Ground conditions including land contamination risk to water resources (**Chapter 14: Ground Conditions**).

22.1.4 This chapter is also supported by:

- a. The following figures in Volume 2 of this EIA Scoping Report:
 - i. **Figure 6-4: Hydrological Zone of Influence;**
 - ii. **Figure 22-1: Part 1 Surface Water Abstractions and Discharge Consents;**
 - iii. **Figure 22-2: Part 1 Risk of Flooding from Surface Water;**
 - iv. **Figure 22-3: Part 1 Flood Map for Planning (Rivers and Sea);**
 - v. **Figure 22-4: Part 1 Risk of Flooding from Reservoirs;**
 - vi. **Figure 22-5: Part 1 WFD Surface Water Bodies;**
 - vii. **Figure 22-6: Part 1 Surface Water Study Area Terrestrial Ecosystems (SSSIs, SPAs, NNRs, LNRs, Ramsar Sites);**
 - viii. **Figure 22-7: Part 1 BGS Aquifer Classification Bedrock, Groundwater Abstractions, Source Protection Zones and Discharge Permits;**
 - ix. **Figure 22-8: Part 1 BGS Aquifer Classification Superficial Drift, Groundwater Abstractions, Source Protection Zones and Discharge Permits;**
 - x. **Figure 22-9: Part 1 WFD Groundwater Bodies;**
 - xi. **Figure 22-10: Part 1 Susceptibility to Groundwater Flooding;**
 - xii. **Figure 22-11: Part 1 Groundwater Vulnerability;**

- xiii. **Figure 22-12: Parts 2 & 3 Surface Water Abstractions and Discharge Consents;**
 - xiv. **Figure 22-13: Parts 2 & 3 Risk of Flooding from Surface Water;**
 - xv. **Figure 22-14: Parts 2 & 3 Flood Map for Planning (Rivers and Sea);**
 - xvi. **Figure 22-15: Parts 2 & 3 Risk of Flooding from Reservoirs;**
 - xvii. **Figure 22-16: Parts 2 & 3 WFD Surface Water Bodies;**
 - xviii. **Figure 22-17: Parts 2 & 3 Surface Water Study Area Terrestrial Ecosystems (SSSIs, SPAs, NNRs, LNRs, Ramsar Sites);**
 - xix. **Figure 22-18: Parts 2 & 3 BGS Aquifer Classification Bedrock, Groundwater Abstractions, Source Protection Zones and Discharge Permits;**
 - xx. **Figure 22-19: Parts 2 & 3 BGS Aquifer Classification Superficial Drift, Groundwater Abstractions, Source Protection Zones and Discharge Permits;**
 - xxi. **Figure 22-20: Parts 2 & 3 WFD Groundwater Bodies;**
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 - xxiii. **Figure 22-22: Parts 2 & 3 Groundwater Vulnerability;**
 - xxiv. **Figure 22-23: Trent and Tame – WFD Water Bodies;**
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 - xxvii. **Figure 22-26: Part 4 Risk of Flooding from Surface Water;**
 - xxviii. **Figure 22-27: Part 4 Flood Map for Planning (Rivers and Sea);**
 - xxix. **Figure 22-28: Part 4 Risk of Flooding from Reservoirs;**
 - xxx. **Figure 22-29: Part 4 WFD Surface Water Bodies;**
 - xxxi. **Figure 22-30: Part 4 Surface Water Study Area Terrestrial Ecosystems (SSSIs, SPAs, NNRs, LNRs, Ramsar sites);**
 - xxxii. **Figure 22-31: Part 4 BGS Aquifer Designation Bedrock, Groundwater Abstractions, Source Protection Zones and Discharge Permits;**
 - xxxiii. **Figure 22-32: Part 4 BGS Aquifer Designation Superficial Drift, Source Protection Zones and Discharge Permits;**
 - xxxiv. **Figure 22-33: Part 4 WFD Groundwater Bodies;**
 - xxxv. **Figure 22-34: Part 4 Susceptibility to Groundwater Flooding; and**
 - xxxvi. **Figure 22-35: Part 4 Groundwater Vulnerability.**
- b. The following appendices in Volume 3 of this EIA Scoping Report:

- i. **Appendix 7-1: Habitat Regulations Assessment Screening Report;** and
- ii. **Appendix 7-2: Water Framework Directive Scoping Report.**

22.1.5 Furthermore, this chapter has also been informed by previous reports from Gate 1, and Gate 2 of the RAPID gated process (available on the Affinity Water website (Ref. 1). Gate 3 assessment reports are currently being developed and have not yet been published but have also informed this Scoping Report.

22.2 Legislation, Planning Policy Context, and Guidance

22.2.1 Legislation, planning policy and guidance relating to the water environment and flood risk is outlined below.

Legislation

22.2.2 Legislation that is relevant to the assessment of the water environment in relation to the Proposed Development includes the below:

- a. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (Ref. 2);
- b. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, which transpose the Water Framework Directive (2000/60/EC) (Ref. 3);
- c. The Environmental Permitting (England and Wales) Regulations 2016 (Ref. 4);
- d. The Environmental Permitting (England and Wales) (Amendment) (EU Exit) Regulations 2019 (Ref. 5);
- e. The Water Supply (Water Quality) Regulations 2018 (Ref. 6);
- f. Water Act 2011 (Ref. 7);
- g. Environment Act 2021 ((Ref. 8);
- h. Levelling up and Regeneration Act 2023 (Ref. 9);
- i. Water Resources Act 1991 (Ref. 10);
- j. Flood and Water Management Act 2010 (Ref. 11);
- k. The Flood Risk Regulations 2009 (Ref. 12);
- l. Land Drainage Act 1991 (Ref. 13); and
- m. Planning Act 2008 (Ref. 14).

22.2.3 The above legislation has informed the identification of sensitive receptors, described in Section 22.5 and also the assessment methodology, described within Section 22.7.

National Policies, Plans and Strategies

22.2.4 The relevant national policies, plans and strategies for water environment and flood risk are summarised within **Table 22-1**. These documents have informed the assessment methodology and approach to mitigation.

Table 22-1: National policies, plans and strategies – Water Environment and Flood Risk

National policies, plans and strategies	Summary of requirements	Relevance to the assessment
National Planning Statement for Water Resource Infrastructure (NPSWRI) (Ref. 15)	• Environmental Net Gain: Paragraphs 3.4.1 to 3.4.4 set out requirements for the Applicant to consider and seek to incorporate improvements to water quality and reductions in flood risk through mitigation and enhancements; • Climate Change Adaptation: Section 3.7, Paragraph 3.7.4 sets out requirements for the Applicant to take account of the effects of climate change when developing and considering water resources NSIP applications, such as climate change adaptations, associated with water quality and flood risk, incorporated into detailed design; • Flood Risk: Paragraphs 4.7.1 to 4.7.15 sets out requirements for flood risk, including the need to undertake a Flood Risk Assessment (FRA), ensure that climate change is considered and that measures are incorporated in detailed design to mitigate the impact of flooding; and • Water Quality: Paragraphs 4.15.1 and 4.15.3 to 4.15.12 set out a series of requirements for the assessment of environmental impacts on surface and groundwater, as well as requirements to deliver improvements to water quality and reductions in flood risk.	• The policy sets out requirements for methodology, baseline assessment and mitigation.
National Planning Policy Framework (NPPF) 2024 (Ref. 16)	• Flood Risk: Section 14, Paragraphs 153 and 159-169 set out detailed considerations for flood risk in terms of climate change adaptation, avoiding new developments in areas of inappropriate flood risk, and ensuring new developments are sufficiently resilient to flooding; and • Water Quality: Section 15, Paragraph 174 states that new development should not pose an unacceptable risk of water pollution and that it should help to improve local environmental conditions, including water quality and actions set out in the River Basin Management Plans (RBMP).	• The policy sets out requirements for methodology, baseline assessment and mitigation.

Local Policy

- 22.2.5 The relevant local policies listed in **Table 22-2** may be both important and relevant to the scope and method of assessment of potential effects on the water environment and flood risk.
- 22.2.6 Other relevant strategic plans and documents are listed in **Table 22-3**.

Table 22-2: List of relevant local policy – Water Environment and Flood Risk

Local authority	Relevant local policy	Reference	Relevance to the assessment
Birmingham City Council	Birmingham Development Plan 2011-2031: • Policy TP2: Adapting to Climate Change; • Policy TP3: Sustainable Construction; • Policy TP6: Management of flood risk and water resources; and • Policy TP8: Biodiversity and Geodiversity.	Ref. 17	The policies set out requirements for the provision of an FRA, Sustainable Drainage Assessment and Operation and Maintenance plan and Sustainable Urban Drainage (SuDS), and requirements for mitigation to manage flood risk and promote sustainable drainage systems, protect the natural environment and promote and enhance biodiversity and ecosystems, conserve water and reduce flood risk.
	New Local Plan for Birmingham (to 2042): • Policy CE1: Climate Change Principles; • Policy CE7: Flood Risk Management; and • CE17: The Canal Network.	Ref. 18	The policies focus upon increasing resilience to climate change, preventing new developments from increasing the risk of flooding from all sources over their anticipated lifetimes and contributing to flooding on third party land, and maximising the canal network's potential, including protecting and enhancing its water quality and reducing flood risk.
North Warwickshire Borough Council	Local Plan for North Warwickshire 2021-2033: • Policy LG16: Natural Environment; • Policy LP18: Tame Valley Wetlands NIA [Nature Improvement Area];	Ref. 19	The plan sets out the required consideration of minimising impacts on and providing net gains for biodiversity, and of protecting and enhancing the natural environment (and its WFD status) through river restoration, sustainable drainage, water efficiency measures and flood storage capacity.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy LP29: Development Considerations; and - Policy LP33: Water and Flood Risk Management.		
Nuneaton and Bedworth Borough Council	Adopted Nuneaton and Bedworth Borough Plan 2011-2031: - Policy NE1: Green infrastructure; - Policy NE3: Biodiversity and geodiversity; and - Policy NE4: Managing flood risk and water quality.	Ref. 20	Both plans set out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and geodiversity, and manage impacts to flood risk and water quality, through FRA, river restoration, sustainable drainage systems and groundwater risk assessments.
	Nuneaton and Bedworth Borough Council Borough Plan Review 2021 – 2039: - Policy NE1 – Green and blue infrastructure - Policy NE3 – Biodiversity and geodiversity; and - Policy NE4 – Managing flood risk and water quality	Ref. 21	
Coventry City Council	Coventry Local Plan (2011-2031): - Policy GE1: Green Infrastructure; - Policy EM1: Planning for Climate Change Adaptation;	Ref. 22	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and geodiversity, and manage impacts to flood risk and water quality, through FRA, river restoration and sustainable drainage systems.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy EM4: Flood Risk Management; and - Policy EM5: Sustainable Drainage Systems (SuDS).		
	Coventry Local Plan Review: Issues and Options Consultation (2023)	Ref. 23	The consultation documents propose minor technical changes to EM1, EM4 and EM5 to be brought in line with national policy updates and the latest guidance. GE1 is proposed to be expanded, although no changes specific to the water environment.
Rugby Borough Council	Rugby Borough Local Plan 2011-2031: - Policy NE1: Protecting Designated Biodiversity and Geodiversity Assets; - Policy SDC5: Flood Risk Management; - Policy SDC6: Sustainable Drainage; and - Policy SDC7: Protection of the Water Environment and Water Supply.	Ref. 24	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and geodiversity, and manage impacts to flood risk and water quality, through FRA, river restoration and sustainable drainage systems.
	Rugby Borough Local Plan: Issues and Options Consultation (2023).	Ref. 25	The consultation documents discuss updating climate change policy to be more stringent.
West Northamptonshire Council	West Northamptonshire Joint Core Strategy Part 1: Policy BN1: Green Infrastructure Connections;	Ref. 26	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and geodiversity, and manage impacts to flood risk

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy BN2: Biodiversity; • Policy BN7A: Water Supply, Quality and Wastewater Infrastructure; • Policy BN7: Flood Risk; and • Policy BN9: Planning for Pollution Control.		and water quality, through FRA, climate change adaptation, river restoration and sustainable drainage systems.
	The Settlements and Countryside (Part 2) Local Plan 2011-2029 for Daventry District: • Policy ENV5: Biodiversity. • Policy ENV11: Local Flood Risk Management.	Ref. 27	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and manage impacts to flood risk through FRA and sustainable drainage systems.
	New Local Plan for West Northamptonshire 2041: • Policy PL1 – Sustainable design and construction; • Policy PL5 – Flood Risk; and • Policy BN9 – Nature Conservation.	Ref. 28	The plan sets out the requirements of sustainable development through climate change adaptation, BNG, FRA and sustainable drainage systems.
Milton Keynes City Council	Plan: MK 2016 – 2031: • Policy FR1: Managing Flood Risk; • Policy FR2: Sustainable Drainage Systems (SUDS) and Integrated Flood Risk Management;	Ref. 29	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and geodiversity, and manage impacts to flood risk, through FRA, climate change adaptation, river restoration and sustainable drainage systems.

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Policy FR3: Protecting and Enhancing Watercourses; • Policy NE1: Protection of Sites; • Policy NE2: Protected Species and Priority Species and Habitats; • Policy NE3: Biodiversity and Geological Enhancement; and • Policy NE6: Environmental Pollution.		
	New City Plan: Ambition and Objectives Consultation 2023.	Ref. 30	The plan sets out the ambitions and objectives for the New City Plan in relation to Sustainability Appraisal, HRA, and Climate and Environmental Action.
Buckinghamshire Council	Vale of Aylesbury Local Plan 2013-2033: • Policy NE1: Biodiversity and Geodiversity; • Policy NE2: River and stream corridors; and • Policy NE5: Pollution, air quality and contaminated land.	Ref. 31	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and geodiversity, and manage impacts to flood risk, through river and stream corridor protection, contaminated land investigation, FRA, climate change adaptation, and sustainable drainage systems.
Buckingham & River Ouzel Internal Drainage Board (IDB)	Buckingham and River Ouzel Internal Byelaws: • Fences, Excavations, Pipes etc;	Ref. 32	The purposes of the byelaws include: • Securing the efficient working of the drainage system in their District;

Local authority	Relevant local policy	Reference	Relevance to the assessment
	• Protection of floodplain; and • Interference with sluices.		• Regulating the effects on the environment in the Board's district of a drainage system; and • Securing the effectiveness of flood risk management work.
Central Bedfordshire Council	Central Bedfordshire Local Plan 2015 to 2035: • Policy EE1: Green Infrastructure; • Policy EE2: Enhancing Biodiversity; • Policy EE3: Nature Conservation; • Policy EE11: The River and Waterway Network; • Policy CC1: Climate Change and Sustainability; • Policy CC3: Flood Risk Management; • Policy CC4: Development Close to Watercourses; • Policy CC5: Sustainable Drainage; • Policy CC7: Water Quality; and; • Policy CC8: Pollution and Land Instability.	Ref. 33	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment, biodiversity and geodiversity, and manage impacts to flood risk and water quality, through FRA, climate change and sustainability, pollution control and sustainable drainage systems.
Luton Council	Luton Local Plan 2011 to 2031: • Policy LLP28: Biodiversity and Nature Conservation;	Ref. 34	The plan sets out the requirements for new developments to protect, conserve and enhance the natural environment and biodiversity, and manage impacts to flood risk and water quality,

Local authority	Relevant local policy	Reference	Relevance to the assessment
	- Policy LLP36: Flood Risk. - Policy LLP38: Pollution and contamination		through FRA, climate change, pollution control and sustainable drainage systems.
	New Local Plan for Luton.	Ref. 35	The New Local Plan is due to be adopted in 2028 and will supersede current Luton Local Plan policies. The Options and Issues Report is due to be published in October / November 2024 and will be reviewed as part of the EIA / Flood Risk Assessment.

Table 22-3: List of other relevant regional or local strategic documents

Document Type	Relevant document	Reference	Relevance to the assessment
River Basin Management Plans (RBMP)	- Humber River Basin District River Management Plan - Anglian River Basin District River Management Plan	Ref. 36 Ref. 37	River Basin Management Plans set the legally binding locally specific environmental objectives that underpin water regulation (such as permitting) and planning activities. They provide a stable planning base for economic development. Each management plan describes the challenges that threaten the water environment and how these challenges can be managed within each river district. The plans are reviewed and updated every 6 years.
Water Cycle Studies	- Joint Warwickshire Partnership Water Cycle Study; and - Milton Keynes City Council Integrated Water Management Study, Phase 1.	Ref. 38 Ref. 39	A Water Cycle Study provides useful information on water environment receptors and sensitivities.

Document Type	Relevant document	Reference	Relevance to the assessment
Catchment Flood Management Plans	River Trent: Catchment Flood Management Plan (CFMP).	Ref. 40	Overview of the flood risk across the river catchment and recommended ways of managing the risk now and over the next 50 to 100 years. The Proposed Development falls into the lower section of the River Trent catchment, including the River Tame. The CFMP sets out how the risk is currently being managed, the impact of climate change and future flood risk, and sets out policy options for how future flood risk can be managed. The CFMP is divided into sub areas, with sub area 6, Mid Staffs and Lower Tame, and sub area 10, Birmingham and Black County, coinciding with the study area.
Strategic Flood Risk Assessments	• Birmingham City Council Level 1 Strategic Flood Risk Assessment; • Birmingham City Council Strategic Flood Risk Management Strategy; • Coventry City Council Level 1 Strategic Flood Risk Assessment; • West Northamptonshire Council Level 1 Strategic Flood Risk Assessment; • Milton Keynes City Council Level 1 Strategic Flood Risk Assessment; • North Warwickshire Borough Council Level 1 Strategic Flood Risk Assessment; and	Ref. 41 Ref. 42 Ref. 43 Ref. 44 Ref. 45 Ref. 46 Ref. 47	A Strategic Flood Risk Assessment (SFRA) provides information on flood risk from all sources, the cumulative impact of a development on flood risk and the effects of climate change on flood risk.

Document Type	Relevant document	Reference	Relevance to the assessment
	Nuneaton and Bedworth Borough Council Level 1 Strategic Flood Risk Assessment.		
Local Flood Risk Management Strategies	- West Northamptonshire Local Flood Risk Management Strategy; - Coventry Council Local Flood Risk Management Strategy; - Milton Keynes City Council Local Flood Risk Management Strategy; and - Warwickshire County Council, Local Flood Risk Management Strategy and Surface Water Management Plan.	Ref. 48 Ref. 49 Ref. 50 Ref. 51	Local Flood Risk Management Studies provide a wider base of knowledge and experience of the locality, e.g. sources and experiences of flooding, knowledge of existing activities that may increase the risk of flooding, the specific issues of the area, what is feasible and what is needed.

Guidance and Standards

22.2.7 Relevant guidance and standards which have been used as part of the scoping process are listed below and will also be taken into account as part of the EIA include:

- a. CIRIA (2001) Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (C532) (Ref. 52);
- b. CIRIA (2006) Control of Water Pollution from Linear Construction Projects – Technical Guidance (C648) (Ref. 53);
- c. CIRIA (2015) Environmental good practice on site (4th edition) (Ref. 54);
- d. CIRIA (2016) Groundwater control: design and practice (second edition) (C750) (Ref. 55);
- e. Department for Transport (DfT) (2022) Transport Analysis Guidance (TAG) Unit A3: Environmental Impact Appraisal (Section 10) (Ref. 56Ref. 56);
- f. Environment Agency (2007) Hydrogeological impact appraisal for groundwater abstractions. Science Report – SC040020/SR2 (Ref. 57);
- g. Environment Agency (2007) Hydrogeological impact appraisal for dewatering abstractions. Science Report – SC040020/SR1 (Ref. 58);
- h. Environment Agency (2017) Protect groundwater and prevent groundwater pollution (Ref. 59);
- i. Environment Agency (2017) Groundwater protection technical guidance (Ref. 60);
- j. National Highways (2019) Design Manual for Roads and Bridges (DMRB) – Sustainability and Environmental Appraisal, LA 113 Road drainage and the water environment. Revision 1. HE-DMRB-SE LA 113 (Ref. 61);
- k. Planning Inspectorate (2017) Advice Note Eighteen: The Water Framework Directive (Ref. 62Ref. 62);
- l. UK Technical Advisory Group (TAG) (2003) Water Framework Directive UK Risk assessment of groundwater-dependent terrestrial ecosystems (Ref. 63);
- m. DMRB (2024) Flood Risk Assessments: Climate Change Allowances (Ref. 64);
- n. Environment Agency's Pollution Prevention Guidance (PPG) notes (PPG1, PPG5, PPG8 and PPG21)¹ (Ref. 65);
- o. DMRB (Undated) Check if you need permission to do work on a river, flood defence or sea defence (Ref. 66Ref. 66); and
- p. Planning Practice Guidance: Flood risk and coastal change (Ref. 67).

¹ The PPG notes have been withdrawn, but in the absence of replacement guidance can be referred to.

22.3 Consultation

22.3.1 Engagement has been undertaken with a number of consultees during the RAPID Strategic Resource Option (SRO) gated process, principally the Environment Agency and Natural England. The comments and outcomes/agreements are summarised below. These include consideration of flow impacts on abstractors, hydro-ecology, water quality, sediment mobility, WFD Assessment and HRA.

22.3.2 The comments from the Environment Agency that have been received to date have highlighted the following areas which required specific assessment and which the progression and development of the Proposed Development is responding to:

- a. Include the effects of climate change on flow and water quality for the Rivers Tame and Trent and the GUC. This has since been considered in RAPID Gate 3 flow and water quality modelling, with further climate change modelling scenarios to be undertaken to support assessments for the ES;
- b. The hydraulic modelling work and monitoring to be used to further understand potential hydro-ecological and hydromorphological impacts, (in particular, for climate change) at low flows for the Rivers Tame and Trent. This has since been considered in RAPID Gate 3 environmental assessments, with further climate change modelling scenarios to be used in hydro-ecological assessments for reporting in the ES;
- c. Modelling and monitoring should inform updated WFD assessment and HRA for the GUC and for the Rivers Tame and Trent. The HRA Screening Report and WFD Scoping Reports are appended to the EIA Scoping Report (**Appendix 7-1** and **Appendix 7-2** in Volume 3 of this EIA Scoping Report, respectively) and which identify where further assessment will be undertaken to inform the full HRA and detailed WFD assessment for the DCO submission; and
- d. The Environment Agency responded regarding sediment mobilisation in the GUC and subsequent impacts on water quality. A sediment assessment was carried out during RAPID Gate 3 which considered physical mobility, targeting locations where potential risks for contaminant mobilisation should be considered to support effect significance assessment in the ES.

22.3.3 A summary of key topics raised during non-statutory consultation with regards to the water environment is provided below:

- a. Construction impacts on the environment, landscape and heritage assets and works associated with the canal;
- b. Impacts from the Proposed Development on the amenity and recreational uses of the canal, e.g. Ruby's Yard;
- c. Choice of route and the method for moving water down the lock flight at Stoke Bruerne;

- d. Changes in water levels along the canal and potential impacts on flood risk (i.e. properties along the canal, areas currently at risk of flooding), recreation and navigation uses;
- e. Increased risk of sedimentation along pinch points in the canal and the impact of navigational use of the canal;
- f. Potential impacts on private potable water abstractions from boreholes for properties along the canal;
- g. Changes in water quality and impacts on water chemistry potentially increasing weed growth and algal blooms; and
- h. Monitoring regimes for flow and water quality.

22.3.4 These topics will be reviewed accordingly in the next stage of EIA.

22.3.5 Furthermore, as part of the EIA process for PEIR and ES, consultation will be undertaken with the local planning authorities (as required) to inform the assessment and mitigation for the Proposed Development.

22.3.6 At this stage, it has been identified that the following consultees will be consulted post-EIA Scoping for the following reasons:

- a. The Environment Agency – water quality, abstraction licence impacts and impact on WFD status, including for climate change impacts;
- b. Relevant local planning authorities and Lead Local Flood Authorities (LLFA) – for flood risk issues;
- c. Natural England – for impact on protected water dependent sites;
- d. Warwickshire Wildlife Trust – for impact on local designated wildlife sites and Sites of Special Scientific Interest (SSSIs);
- e. Catchment Partnership Groups – for impact on affected waterbodies in the catchments;
- f. Abstractors on the Tame and Trent – for impact on third party abstractions; and
- g. The Bucks & River Ouzel Internal Drainage Board (IDB) – for impact on drainage related to the Ouzel catchment.

22.4 Study area

22.4.1 The study area for water environment and flood risk is determined by the connectivity of different types of hydrological receptors to the Proposed Development. These hydrological receptors vary in their spatial extent and hydrological continuity for example, where there is the potential for an impact source to directly influence river flow, the spatial extent of impact can propagate downstream for long distances from the impact source, extending the study area.

22.4.2 A 1 km buffer around the EIA Scoping Boundary (including the Indicative Non-Working Area for Part 2) has been used as the study area to identify hydrological receptors and sources of flood risk which have a potential impact pathway to the Proposed Development. This study area has also been used to identify users (such as abstractors or dischargers) or habitats dependent on those hydrological features. Then, using professional

judgement, where effects to a hydrological feature identified have the potential to occur beyond the 1 km study area, a wider hydrological Zone of Influence (Zoi) has been identified to show a greater spatial extent of that feature (e.g. full aquifer extent or connected downstream watercourses). This wider Zoi has been applied as follows:

- a. The hydrological Zoi related to the operation of Part 1a (Minworth AWTP) of the Proposed Development covers the River Tame between Minworth and its confluence with the River Trent and, the River Trent from its confluence with the River Tame to its tidal limit at Cromwell Weir in Nottinghamshire (this represents a distance of approximately 130 km of river). This acknowledges the spatial extent of potential impact from operation of the Proposed Development which would result in up to 115 Ml/d of the Minworth WwRC recycled discharge volume being diverted from the River Tame;
- b. The extent of canals connected to Part 2 and included in the study area is shown on **Figure 22-16** (in Volume 2 of this EIA Scoping Report); and
- c. Where there is the potential for impact pathways to hydrogeological features, the full extent of the identified WFD groundwater bodies has been included within the wider hydrological Zoi. In these cases, abstractors, dischargers and water dependent habitats have been identified within the 1 km study area, but the wider aquifer extent will be assessed for overall qualitative and quantitative WFD status change.

22.4.1 In all cases, the hydrological extent of impacts and hence study area will be further refined, using modelling and related quantitative analysis as assessment of water resource and flood risk impacts is progressed for the ES.

22.4.2 **Table 22-4** provides a summary of the study area for each Development Part. The wider hydrological Zoi is shown on **Figure 6-4** (in Volume 2 of this EIA Scoping Report).

Table 22-4: Summary of study areas

Reference point	Study area definition
Part 1a: Minworth AWTP	1 km radius from the Part 1a EIA Scoping Boundary as well as the River Tame between Minworth WwRC and its confluence with the Trent and, the River Trent from its confluence with the River Tame to the tidal limit at Cromwell Weir in Nottinghamshire. Full extent of WFD groundwater bodies where hydrological change within the aquifer may occur has been used for the hydrological Zoi, with associated groundwater users and habitats identified within the 1 km study area.

Reference point	Study area definition
Part 1b: Minworth to Atherstone Pipeline	1 km radius from the Part 1b EIA Scoping Boundary as well as some attributes of surface water outside this 1 km study area where hydrological change can propagate downstream – the extent of the WFD surface water body catchment for each waterbody has been used for this purpose. Full extent of WFD groundwater bodies where hydrological change within the aquifer may occur has been used for the hydrological Zol, with associated groundwater users and habitats identified within the 1 km study area.
Part 2: Works to the Coventry, Oxford and Grand Union Canals	1 km radius from the Part 2 EIA Scoping Boundary (including the Indicative Non-Working Area). The full extent of each canal WFD waterbody connected to Part 2 has also been included in the study area which incorporates all hydraulically connected arms of each canal section; this extends the study area beyond 1 km in several locations. Additionally, attributes of surface water (watercourses connected to the canal or with flood risk pathways), outside this 1 km study area have been included where hydrological change can propagate downstream – the extent of the WFD surface water body catchment for each waterbody has been used for this purpose. Full extent of WFD groundwater bodies where hydrological change within the aquifer may occur has been used for the hydrological Zol, with associated groundwater users and habitats identified within the 1 km study area.
Part 3: Daventry and Drayton Reservoirs	1 km radius from the Part 3 proposed channel/culvert/pipeline, the reservoirs as well as any attributes of surface water, outside this 1km study area where hydrological change can propagate downstream – the extent of the WFD surface water body catchment for each waterbody has been used for this purpose. Full extent of WFD groundwater bodies where hydrological change within the aquifer may occur has been used for the hydrological Zol, with associated groundwater users and habitats identified within the 1 km study area.

Reference point	Study area definition
Part 4a: Abstraction, Storage and Treatment	Site B: 1 km radius from the Part 4a (Site B) EIA Scoping Boundary as well as any attributes of surface water, outside this 1 km study area where hydrological change can propagate downstream – the extent of the WFD surface water body catchment for each waterbody has been used for this purpose. Full extent of WFD groundwater bodies where hydrological change within the aquifer may occur has been used for the hydrological Zol, with associated groundwater users and habitats identified within the 1 km study area.
	Site H: 1 km radius from the Part 4a (Site H) EIA Scoping Boundary as well as any attributes of surface water, outside this 1 km study area where hydrological change can propagate downstream – the extent of the WFD surface water body catchment for each waterbody has been used for this purpose. Full extent of WFD groundwater bodies where hydrological change within the aquifer may occur has been used for the hydrological Zol, with associated groundwater users and habitats identified within the 1 km study area.
Part 4b: Pipeline to an Underground Reservoir near Luton	1 km radius from the Part 4b EIA Scoping Boundary, including the Part 4b pipeline options associated with Part 4a Site B (SP2, SP2A and SP2B), Part 4b pipeline options associated with Part 4a Site H (SP5, SP6 and SP7) and the common sections of the Part 4b pipeline options (SP10, SP10A, SP10B, and SP10C). In addition, any attributes of surface water, outside this 1 km study area where hydrological change can propagate downstream – the extent of the WFD surface water body catchment for each waterbody has been used for this purpose. Full extent of WFD groundwater bodies where hydrological change within the aquifer may occur has been used for the hydrological Zol, with associated groundwater users and habitats identified within the 1 km study area.

22.5 Baseline Conditions

Sources of baseline data

- 22.5.1 To inform the work undertaken to date and this scoping exercise, data, information and records relating to water features, resources and receptors were gathered from a number of sources. **Table 22-5** summarises the key data sources which have been used to inform the baseline assessment for the water environment and flood risk.

Table 22-5: Sources of baseline data

Datasets used for this chapter	Published by
Risk of Flooding from Rivers and Sea	Environment Agency
Risk of Flooding from Surface Water	Environment Agency
Risk of Flooding from Reservoirs	Environment Agency
AIMS Spatial Flood Defences	Environment Agency
Historic Flood Map	Environment Agency
Recorded Flood Outlines	Environment Agency
LiDAR Digital Terrain Model	Environment Agency
Drinking Water Safeguard Zones (surface water)	Environment Agency
Drinking Water Safeguard Zones (ground water)	Environment Agency
Drinking Water Protected Areas (Surface Water)	Environment Agency
Source Protection Zones	Environment Agency
Flood Map for Planning and Sea Storage Areas	Environment Agency
Flood Map for Planning (Rivers and Sea) – Flood Zone 2	Environment Agency
Flood Map for Planning (Rivers and Sea) – Flood Zone 3	Environment Agency
Statutory Main Rivers	Environment Agency
Priority River Habitats	Environment Agency
Surface Water and Groundwater Discharge Consented Permits	Environment Agency
Abstractions Licences (July 2024)	Environment Agency
WFD Groundwater Data	Environment Agency
WFD Surface Water Data	Environment Agency
Sites of Special Scientific Interest	Natural England
Ramsar sites	Natural England
Local Nature Reserves	Natural England
National Nature Reserves	Natural England
Special Protection Areas	Natural England
Special Areas of Conservation	Natural England
Priority River Habitats	Natural England
Susceptibility to Groundwater Flooding	British Geology Society
Aquifer Designation Map (Bedrock)	British Geology Society
Aquifer Designation Map (Superficial)	British Geology Society
Groundwater Vulnerability Map	British Geology Society
Geology – Bedrock	British Geology Society
Geology – Superficial	British Geology Society
Geology – Linear Features	British Geology Society
Geology – Artificial Ground	British Geology Society

Datasets used for this chapter	Published by
Gauged flow data	National River Flow Archive
Canal and River Network	Canal & River Trust

Existing Baseline

- 22.5.2 This section provides a summary of the baseline conditions in respect of the water environment and flood risk. The baseline investigations carried out through the RAPID gated processes are referred to for more details. Gate 3 reports will be published in due course on the Affinity Water website and where relevant the results of Gate 3 investigations are reported within this EIA Scoping Report.

Part 1a: Minworth AWTP

Surface Water features (within the 1km study area)

- 22.5.3 The potential surface water receptors within the 1 km study area around the Part 1a EIA Scoping Boundary are set out initially in this section and presented on **Figure 22-5**. A further section, 'Rivers Tame and Trent', covers the features within the extended study area for surface water features, presented on **Figure 22-23**.

River Tame (within the 1km study area)

- 22.5.4 The River Tame is an Environment Agency designated Main River which flows from west to east, approximately 300 m south of the Proposed AWTP. At this location, the River Tame has a catchment area of approximately 408 km², approximately 74% of which is urban (Ref. 68).
- 22.5.5 With respect to WFD classification, the River Tame is within the wider Tame Anker and Mease WFD Management Catchment, and within the Tame Lower Rivers and Lakes WFD Operational Catchment. At this location, the specific WFD waterbody unit for the river is the 'Tame – R Rea to R Blythe' (ID: GB104028046841); this WFD waterbody unit is approximately 11 km long and extends from the River Tame's confluence with the River Rea approximately 4 km upstream (west) of the 1 km study area, to the river's confluence with the River Blythe approximately 5 km downstream (east) of the study area (as shown on **Figure 22-5**).
- 22.5.6 Historically, this River Tame WFD waterbody unit has been engineered and is designated as a Heavily Modified Water Body. This WFD waterbody is classified as having a Moderate overall potential (combining both chemical and ecological status / potential) (as shown on **Figure 22-5**). In the most recent River Basin Management Cycle 3 (2022) (Ref. 36 and Ref. 69), the water body was classified as having Moderate Ecological potential and did not require assessment for Chemical Status. In the previous River Basin Management Cycle 2 monitoring undertaken in 2019 (Ref. 69) shows there has been no change in classification, but the Chemical Status was recorded as Fail. Reasons for not achieving 'Good' potential are attributed to diffuse and point source pollution sources including sewage discharges, urbanisation, and contaminated land.

- 22.5.7 Water quality monitoring of this section of the River Tame was carried as part of the Gate 2 and 3 environmental assessments between August 2021 and August 2023 and September 2023 and March 2024, respectively. The closest locations monitored to the Part 1a EIA Scoping Boundary were at NGR 413890 290180 upstream of Minworth WwRC discharges (upstream of Part 1a), which was replaced by a later monitoring point added at Water Orton Lane (at NGR 417370 291400 upstream of Part 1a), and NGR 419180 291440 (downstream of Part 1a). Several parameters showed a marked difference in concentrations between the monitoring locations immediately upstream and downstream of the Minworth WwRC discharge. For determinants categorised under fuels and metals, other land uses, including industrial and runoff from adjacent greenfield areas, between the two monitoring locations may be impacting water quality in the Tame and account for the differences seen. For nitrate, phosphorus, orthophosphate (both as P and PO₄), bromide, total organic carbon, and dissolved organic carbon, the difference may be attributable to the Minworth WwRC discharge.
- 22.5.8 Full details of the Gate 2 monitoring carried out are presented in the Gate 2 Minworth SRO Water Quality – Baseline Monitoring and Modelling report (Ref. 71). The Gate 3 report is as yet unpublished at the time of writing this EIA Scoping Report.
- 22.5.9 There are three active flow gauging stations on the River Tame. One gauge at Water Orton, is located immediately upstream of Part 1a 1 km study area, and one at Lea Marston is located approximately 7.5 km downstream of the study area. A historical gauge was present at Lea Marston, which was replaced by the current gauge in 1982. The key flow statistics from these gauges are presented in **Table 22-6**.

Table 22-6: Selected flow statistics for the River Tame in the Part 1a study area (Ref. 72)

Gauging Station Name (NFRA ID)	Years active	QMED (m ³ /sec)	Q95 (m ³ /sec)
Water Orton	1955 to present	79.7	2.068
Lea Marston (28044)	1956 to 1982	61.5	7.25
Lea Marston Lakes (28080)	1982 to present	117	7.41

Birmingham and Fazeley Canal

- 22.5.10 The Birmingham and Fazeley Canal is a 24 km canal which runs from central Birmingham to the Coventry Canal, in Fazeley. It passes through the study area 200 m north of the Part 1a EIA Scoping Boundary. The pound within the study area is between the Lock 3 Minworth Lock and Lock 1 Curdworth Top Lock (approximately 3.5 km length).
- 22.5.11 The Birmingham and Fazeley Canal through the Part 1a study area is a WFD waterbody named 'Birmingham and Fazeley Canal upper section' (ID: GB70410515) (as shown on **Figure 22-5, Sheet A**) and is designated as an Artificial Water Body. In the most recent River Basin Management Cycle 3 (2022) (Ref. 36), the water body was classified as having Good Ecological Potential and did not require assessment for Chemical Status. In the

previous River Basin Management Cycle 2 monitoring undertaken in 2019 (Ref. 69) shows there has been no change in classification, but the Chemical Status was recorded as Fail. The objective of the water body is to achieve Good potential.

Marsh Lane Pools

22.5.12 There is an open water body on the right bank of the River Tame designated as a Local Wildlife Site. This is located approximately 400 m to the south of the Part 1a EIA Scoping Boundary, on the opposite side of the River Tame.

Other key features

22.5.13 There are two public surface water abstraction licenses within the Part 1a study area (see **Figure 22-1, Sheet A**), associated with the Birmingham and Fazeley Canal.

22.5.14 Data on private surface water abstractions within the study area has been requested. Not all of this data has been made available at the time of completing the scoping; however, this data will be sourced and included within the next stage of the EIA.

22.5.15 There are no Drinking Water Safeguard Zones (surface water) within the Part 1a study area (see **Figure 22-1, Sheets A to D**).

22.5.16 There are 4 Environment Agency consented surface water discharge permits within the Part 1a study area, which are mostly associated with the Minworth WwRC (see **Figure 22-1, Sheet A**).

Hydrogeology

22.5.17 Geological and hydrogeological mapping indicates that the study area around the Part 1a EIA Scoping Boundary is underlain by the superficial deposits (see **Figure 22-8**) and bedrock geology (see **Figure 22-7**), and aquifer designations, as outlined in **Table 22-7**. For BGS geological descriptions, see **Chapter 14: Ground Conditions**. Note that these aquifer designations relate to superficial deposits and bedrock geology found underlying both the Part 1a EIA Scoping Boundary and study area.

Table 22-7: Aquifer designations within Part 1a study area

Geological Strata	EA Aquifer Designation
<i>Superficial Deposits:</i>	
River Terrace Deposits	Secondary A
Alluvium	Secondary A
Head	Secondary undifferentiated
Glaciolacustrine Deposits	Unproductive
Glaciofluvial Deposits	Secondary A
<i>Bedrock Geology:</i>	
Sidmouth Mudstone Formation	Secondary B

- 22.5.18 Groundwater vulnerability mapping within both the Part 1a EIA Scoping Boundary and within the study area indicates a medium to high risk, with a small strip of high risk towards Kingsbury Road, from pollution, with a potential for the presence of solution features, which would enable a rapid movement of pollutants. The Birmingham SFRA (Ref. 41) notes that while there is no data on groundwater flooding in the City, there is a high risk from rebounding groundwater, which affects groundwater regionally, following a reduction in abstraction for industrial use (see **Figure 22-11, Sheet A**).
- 22.5.19 There are no SPZs for public groundwater supply abstractions located within the Part 1a study area (see **Figure 22-7** and **Figure 22-8, Sheet A**). The nearest is approximately 5.7 km to the north-west.
- 22.5.20 However, there is one licenced groundwater abstraction for industrial use in the Part 1a study area (see **Figure 22-7** and **Figure 22-8, Sheet A**).
- 22.5.21 Data on private groundwater water abstractions within the study area has been requested. Not all of this data has been made available at the time of completing the scoping; however, this data will be sourced as part of the next stage of the EIA.
- 22.5.22 There are no Environment Agency discharge consents to groundwater within the Part 1a study area.
- 22.5.23 There are no drinking water safeguard zones (groundwater) within the Part 1a study area.
- 22.5.24 The Part 1a study area is located in the Tame, Anker and Mease Catchment Abstraction Management Strategy (CAMS). CAMS help to identify where water resource demands may be impacting the water balance.
- 22.5.25 The proposed Minworth AWTP is located within one WFD groundwater body, as detailed in **Table 22-8** and presented in **Figure 22-9, Sheet A**.

Table 22-8: WFD groundwater bodies and Classification (Minworth to Atherstone Pipeline study area)

Groundwater body ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Chemical Status
GB40402G990800	Tame Anker Mease-Secondary Combined	1,140.57	Good	Good

Flood risk

- 22.5.26 The River Tame presents the main fluvial source of flooding in the Part 1a 1 km study area around the Part 1a EIA Scoping Boundary and has been assessed as part of FRAs undertaken for the Minworth SRO AWTP at Gate 2 and Gate 3 of the RAPID process.
- 22.5.27 The Risk of Flooding from Rivers and Sea mapping (see **Figure 22-3, Sheet A**) shows that the eastern part of the Part 1a EIA Scoping Boundary (containing the proposed wetlands, filter buildings, chemical compounds, pumping station and kiosks) are at Medium risk of flooding from the River

Tame; with part of the access road at Low risk and the remainder of the Part 1a EIA Scoping Boundary at a Very Low risk.

- 22.5.28 Flood defences are present along the River Tame, although the Gate 3 FRA (as yet unpublished) for Part 1a of the Proposed Development found that the latest Environment Agency hydraulic model of the area demonstrates that the flooding across the Proposed AWTP is worse in a defended scenario. The extents are greater when taking climate change into consideration, although parts of the access roads are still at a Very Low risk of flooding.
- 22.5.29 The Environment Agency's Risk of Flooding from Surface Water mapping indicates that the risk of surface water flooding ranges from High along part of the access track to Low in other areas (see **Figure 22-2, Sheet A**). The dataset shows that the deepest predicted flooding along the access track is predicted to be between 300-900 mm (millimetres) in a 1% Annual Exceedance Probability (AEP) event and over 900 mm in a 0.1% AEP event.
- 22.5.30 There is a residual risk of flooding from Bartley Reservoir, Earlswood Lakes and Edgbaston Reservoir (see **Figure 22-4, Sheets A to C**), should there be a failure in the dam and the downstream watercourses are already flooded. The flood extents are predicted to inundate most of the proposed Minworth AWTP, with only the access roads remaining dry. If a breach was to occur in Bartley Reservoir when the downstream watercourses are at 'normal' levels the proposed Minworth AWTP is not predicted to flood.
- 22.5.31 The Birmingham and Fazeley Canal also presents a potential residual risk of flooding. Although this Canal does not appear to be embanked at this point and a natural flood flow pathway from the Canal to the proposed Minworth AWTP would be restricted by the Kingsbury Road which is slightly elevated.
- 22.5.32 The BGS's Susceptibility to Groundwater flooding map (Ref. 73) (see **Figure 22-10, Sheet A**) shows that the majority of the proposed Minworth AWTP is considered to have "...potential for groundwater flooding to occur at surface". An area in the west of the proposed Minworth AWTP, where the flocculation and sedimentation units are to be located is considered to have "...potential for groundwater flooding of property situated below ground level". This groundwater flood risk is associated with the semi-permeable superficial deposits.
- 22.5.33 According to the Environment Agency's Historic Flood Maps and Recorded Flood Outlines (Ref. 74), there are no records of historic flooding events occurring in the Part 1a study area. Historical records were also checked as part of the FRA prepared for Gate 3 (as yet unpublished) and no evidence of historical flooding was found.

Water dependent ecological features and protected habitats – 1km study area

- 22.5.34 There are no identified Groundwater Dependant Terrestrial Ecosystems (GWDTE) located within the 1 km study area. (see **Figure 22-6, Sheet A**). The Part 1a EIA Scoping Boundary is located within the Whitacre Heath SSSI risk zone, The site includes a variety of habitats such as pools, woodland and wet grassland.

Rivers Tame and Trent – extended surface water study area for Part 1a

- 22.5.35 The River Tame (between Minworth WwRC and its confluence with the River Trent) and the River Trent (between its confluence with the River Tame and its tidal limit at Cromwell Weir) have been included in the wider study area for surface water features for Part 1a, as presented in **Figure 22-23**. This 130 km length of combined river would be subject to a flow reduction of between 23 and 115 Ml/d through the operation of Part 1a.
- 22.5.36 Between the 1 km study area around the Part 1a EIA Scoping Boundary and the confluence with the River Trent, the River Tame is joined by several key tributaries including the River Blythe, the River Cole, the Bourne and the Anker at Tamworth. Compared to its heavily modified nature upstream in Birmingham, the River Tame recovers more of a natural profile with increasing floodplain connectivity downstream of Minworth WwRC; however, its flow regime is influenced by the volume of discharge of recycled water from Minworth WwRC and Coleshill WwRC, particularly at lower flows.
- 22.5.37 A key feature of the Tame downstream of Part 1a EIA Scoping Boundary (approximately 6.5 km downstream) is Lea Marston Lakes, which were created from a repurposed quarried area to create online purification lakes. These allowed sediments and contaminants in the River Tame to settle out and help improve downstream water quality.
- 22.5.38 In addition to the 'R Rea to R Blythe' WFD Water Body described for the Part 1a study area, the River Tame comprises a further WFD waterbody unit (namely, 'Tame from River Anker to River Trent') until its confluence with the River Trent at Alrewas. The WFD waterbody units, their size, current WFD Status and hydromorphological designation are set out in **Table 22-9**. **Figure 22-23** shows the WFD surface waterbodies.
- 22.5.39 The River Trent between its confluence with the River Tame and its tidal limit at Cromwell is referred to as the Lower Trent and is a predominantly moderate to lowland catchment. The River Trent initially has areas of wide, connected floodplain but is narrowed through the wider conurbation of Nottingham. In this section, the Trent is joined by several large tributaries including the River Dove, River Derwent and River Erewash upstream of Nottingham, the River Soar and River Leen at Nottingham and the Greet and Dover Beck downstream.
- 22.5.40 From Shardlow (upstream of Nottingham) to Cromwell Weir the River Trent is navigable, with a system of weirs and locks controlling water levels and allowing navigational craft to move between reaches of the River Trent.
- 22.5.41 The Lower Trent catchment (including its major tributaries) is an important source of abstraction water for public water supply, as well as the energy sector and agricultural needs. To manage this, abstraction licences throughout the Lower Trent system are subject to conditions linked to flow triggers at key monitoring points in the river, with the most important being a Hands off Flow (HoF) measured at North Muskham gauging station. The HoF is a prescribed flow value which, when recorded in the river, requires restriction or cessation of abstractions in order to protect both environmental flows and navigational rights on the river system.
- 22.5.42 Between its confluence with the River Tame and its tidal limit at Cromwell Weir, the Lower Trent comprises four WFD waterbody units. The WFD

waterbody units, their size, current WFD Status and hydromorphological designation are set out in **Table 22-9**.

- 22.5.43 There are 143 licences for the abstraction of surface water from the Rivers Tame and Trent within the 130 km length defined in the extended study area (see **Figure 22-24** for their locations). These licences vary in their use, but include irrigation for agriculture, source water for public water supply, source water for hydro-electric power plants, cooling water, source transfers, supply sources for canals, fish passes, canoe slaloms and mineral washing. These abstractors and their licence conditions have been considered for impact throughout the RAPID gated process for the Proposed Development and are included in the scope of assessment for the EIA.
- 22.5.44 There are several water-dependent designated sites connected to the Rivers Tame and Trent in this 130 km length of combined river. This includes three designated SSSIs which contain wetland habitats within 10 km of the Part 1a 1 km study area (see **Figure 22-6, Sheet A to D**) – these are Whitacre Heath (2.3 km east), Kingsbury Wood (6.4 km north-east) and Bentley Park Wood (10.2 km east). All water designated sites potentially connected to the wider Tame and Trent study area have been identified and included in **Chapter 12: Ecology – Aquatic**.

Table 22-9: WFD waterbody status for Rivers Tame and Trent

Water body ID	Waterbody Name	Catchment Area (km²)	Overall Status	Ecological Status/Potential	Chemical Status¹	Hydromorphological Designation
GB104028046440	Tame from R Blythe to River Anker	64.66	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified (supports good)
GB104028047050	Tame from River Anker to River Trent	90.58	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified (supports good)
GB104028047180	Trent from R Tame to R Dove	88.47	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified (supports good)
GB104028047180	Trent from Dove to Derwent	56.43	Moderate	Moderate	Not assessed (Fail, 2019)	Not designated artificial or heavily modified (supports good)
GB104028053120	Trent from Derwent to Soar	8.28	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified
GB104028053110	Trent from Soar to The Beck	139.73	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified

¹ In Cycle 3 (2022) of the RBMPs, the identified waterbodies did not require assessment for Chemical Status. For the previous RBMP cycle (2019) the Chemical Status for all identified waterbodies was 'Fail'.

Part 1b: Minworth to Atherstone Pipeline*Surface Water*

- 22.5.45 The proposed pipeline route (18 km) from Minworth to Atherstone crosses one Main River: the River Tame at Lea Marston between Birmingham Road and Lea Marston Lakes (see **Figure 22-5, Sheet A**).
- 22.5.46 The proposed pipeline route also crosses the WFD waterbody, Dog Lane Brook to the east of Kingsbury Water Park (see **Figure 22-5, Sheet B**). The proposed pipeline also crosses seven Ordinary Watercourses along its route based on ordnance survey mapping. One of the proposed access and working areas also crosses an unnamed Ordinary Watercourse near to Drybrooks Woods.
- 22.5.47 A Break Pressure Tank (BPT) is proposed to be installed at Baxterley as part of the Proposed Development to manage water pressure, with additional chambers, hardstanding areas and security fencing. The BPT will be located approximately 150 m to the east of an unnamed Ordinary Watercourse that appears to be linked to Black Pool within the grounds of Merevale Hall.
- 22.5.48 Approximately 1 km west of Atherstone, the pipeline is proposed to pass upstream of Merevale Lake which is not classified as a WFD waterbody. This lake appears to be fed by at least two tributaries (one named the Innage Brook) which the proposed pipeline will cross.
- 22.5.49 A summary of the status under WFD for all of the designated waterbodies within the Part 1b study area is provided in **Table 22-10**.

Table 22-10: WFD classifications (Part 1b study area)

Waterbody ID	Waterbody Name	Operational Catchment (km²)	Overall Status	Ecological Status/Potential	Chemical Status¹	Hydromorphological Designation
GB104028046440	Tame from R Blythe to River Anker Water Body	61.659	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified (supports good)
GB104028042630	Dog Lane Brook from Source to R Tame Water Body	20.725	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified (supports good)

¹ In Cycle 3 (2022) of the RBMPs, the identified waterbodies did not require assessment for Chemical Status. For the previous RBMP cycle (2019) the Chemical Status for all identified waterbodies was 'Fail'.

22.5.50 There are 12 Environment Agency licenced surface water abstractions within the Part 1b study area (see **Figure 22-1, Sheets A to D**), and three which cross the Part 1b EIA Scoping Boundary (see **Figure 22-1, Sheets C and D**).

22.5.51 There are two private water abstractions located within the Part 1b study area associated with domestic use. Limited information was available at scoping as to the source of these abstractions; however, it has been assumed that these are private boreholes and hence they are included in the hydrogeology baseline section for Part 1b.

22.5.52 There are eleven Environment Agency consented surface water discharges within the Part 1b study area. One of these discharges is located in the Part 1b EIA Scoping Boundary. Discharges are predominantly associated with treated sewage effluent discharges from water utilities and commercial or farm properties.

22.5.53 There is one Drinking Water Surface Water Safeguard Zone (surface water) and one Drinking Water Protected Area (surface water) within the Part 1b study area (see **Figure 22-1, Sheet D**).

Hydrogeology

22.5.54 Geological and hydrogeological mapping indicates that Part 1b study area is underlain by the superficial deposits and bedrock geology, and aquifer designations, as outlined in **Table 22-11** and also shown in **Figure 22-7, Sheets A to D**, and **Figure 22-8, Sheets A to D**. For BGS geological descriptions, see **Chapter 14: Ground Conditions**. Note that these aquifer designations are found underlying both the Part 1b EIA Scoping Boundary and the study area.

Table 22-11: Aquifer designations within Part 1b study area

Geological Strata	Aquifer Type
<i>Superficial Deposits:</i>	
River Terrace Deposits	Secondary A
Alluvium	Secondary A
Head	Secondary undifferentiated
Glaciolacustrine Deposits	Unproductive
Glaciofluvial Deposits	Secondary A
Wolston Glaciogenic Formation	Secondary undifferentiated
Anker Sand and Gravel	Secondary A
<i>Bedrock Geology:</i>	
Sidmouth Mudstone Formation	Secondary B
Halesowen Formation – mudstone siltstone and sandstone	Secondary A
Halesowen Formation – limestone	Principal

Geological Strata	Aquifer Type
Halesowen Formation – sandstone	Secondary A
Salop Formation	Principal
Pennine Middle and Lower Coal Measures Formations	Secondary A
Millstone Grit Group	Secondary B
Merevale Shale Formation – mudstone	Secondary B
Midlands Minor Intrusive Suite	Secondary B
Monks Park Shale Formation	Secondary B
Moor Wood Sandstone Formation	Secondary B
Outwoods Shale Formation	Secondary B
Mancetter Shale Formation	Secondary B
Abbey Shale Formation	Secondary B
Purley Shale Formation	Secondary B
Helsby Sandstone Formation	Principal

22.5.55 Groundwater vulnerability mapping (**Figure 22-11, Sheets A to D**) indicates that most of the Part 1b study area is mapped as being at High risk from pollution, likely due to the absence of superficial deposits. To the east of Hurley, groundwater vulnerability is Medium to High risk, in areas where there are superficial deposits mapped.

22.5.56 There are no SPZs for public groundwater supply abstractions within the Part 1b study area. The nearest SPZ is located at approximately 6km to the south-east and outside of the study area.

22.5.57 There are three licenced groundwater abstractions for agricultural, commercial and industrial uses in the Part 1b study area, two of which fall within the Part 1b EIA Scoping Boundary (see **Figure 22-7** and **Figure 22-8, Sheets B to D**).

22.5.58 There are two private water abstractions located within the Part 1b study area (see **Figure 22-7** and **Figure 22-8, Sheets B to D**) associated with domestic use. Limited information was available at scoping as to the source of these abstractions; however, it has been assumed that these are private boreholes. This information will be verified as part of the next stage of the EIA depending on whether an impact pathway to the abstraction sources is likely.

22.5.59 There are no drinking water safeguard zones (groundwater) within Part 1b study area.

22.5.60 There are four Environment Agency consented discharges to groundwater within the Part 1b study area, these are for treated sewage effluent discharges from domestic or farm properties.

22.5.61 The Part 1b study area lies in the Tame, Anker and Mease CAMS area and it is located within one WFD groundwater body as shown in **Table 22-12** and in **Figure 22-9, Sheets B to D**.

Table 22-12: WFD groundwater bodies and Classification (Part 1b study area)

Groundwater body ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Chemical Status
GB40402G990800	Tame Anker Mease-Secondary Combined	1140.57	Good	Good

Flood risk

22.5.62 The River Tame and its tributaries are the main sources of fluvial flooding in the study area.

22.5.63 The Risk of Flooding from Rivers and Sea (see **Figure 22-3, Sheets A to D**) shows that the majority of the Part 1b study area is at a Very Low risk of flooding. There are two areas which are shown to be at a Medium to High risk of flooding where the proposed pipeline crosses the River Tame to the east of Lea Marston and where it is proposed to cross a Dog Lane Brook, near to Coventry Road (see **Figure 22-3, Sheet B**).

22.5.64 The Risk of Flooding from Rivers and Sea mapping covers EA designated Main Rivers and some larger Ordinary Watercourses. There are several Ordinary Watercourses in the study area not covered by the rivers and sea mapping and hence the Risk of Flooding from Surface Water mapping can be used as an indication for these watercourses. This mapping (see **Figure 22-2**) shows that there is Very Low risk of flooding for the majority of the proposed pipeline route. The exceptions to this are:

- a. Near to the access point from Faraday Road (see **Figure 22-2, Sheet A**) – in this location there is predicted to be surface water ponding which causes a Low to High risk of flooding. This originates from a field to the west of Lichfield Road;
- b. Near to Bodymore Green (see **Figure 22-2, Sheet B**) – in this location there is predicted to be a Low to High risk of surface water flooding, covering an approximate 1km stretch of the proposed pipeline. This flooding appears to be associated with direct runoff from fields and also Ordinary Watercourses;
- c. Near to Meadow Road, Hurley (see **Figure 22-2, Sheet C**) – in this location there is predicted to be a Low to Medium risk of surface water flooding in the field between Meadow Road and Hurley Kings Football club, the proposed pipeline crosses this field. This flooding appears to be direct runoff from the field;
- d. North of Atherstone Lane (see **Figure 22-2, Sheet C**) – in this location the proposed pipeline crosses an Ordinary Watercourse which has a Medium to High risk of flooding;
- e. Northeast of Drybrook Woods (see **Figure 22-2, Sheet B**) – in this location the proposed pipeline crosses an area of Low to High surface water flood risk, which is overland flow heading towards an Ordinary Watercourse which flows through Drybrooks Woods;

- f. North of Woodside Cottages (see **Figure 22-2, Sheet D**) – in this location the proposed pipeline crosses an area of Low to High surface water flood risk which is associated with an Ordinary Watercourse that is a tributary of Merevale Lake;
- g. Upstream of Merevale Lake (see **Figure 22-2, Sheet D**) – in this location the proposed pipeline crosses the Innage Brook, and which poses a Low to High surface water flood risk; and
- h. Coleshill Road (see **Figure 22-2, Sheet D**) – in this location the proposed pipeline crosses a narrow surface water flood flow pathway originating from Atherstone Golf Club and along the road, this is predicted to pose a Low to High risk of flooding.

22.5.65 The Risk of Flooding from Reservoirs Map shows there is a residual risk of flooding from Shustoke Upper and Shustoke Lower reservoirs (see **Figure 22-4, Sheets A to D**), should there be a failure in the dam when downstream water levels are 'normal'. If the downstream water levels are high the flood depths and extents are predicted to be greater.

22.5.66 The BGS's Susceptibility to Groundwater flooding map (see **Figure 22-10, Sheets B to D**) shows that most of the proposed pipeline to the west of Hurley has the "...potential for groundwater flooding to occur at surface". To the east of Hurley, the mapping shows there to be either no potential for groundwater flooding to occur or limited potential. The source of potential groundwater flooding to the western half of the proposed pipeline is associated with the superficial deposits.

22.5.67 According to the Environment Agency's Historic Flood Maps and Recorded Flood Outlines (Ref. 74), there has been historic flooding associated with the River Tame at Lea Marston in the Part 1b study area.

Hydromorphology

22.5.68 The proposed pipeline crosses the River Tame at Lea Marston. At this location the local River Tame WFD waterbody is the Tame from R Blythe to River Anker Water Body (WFD water body ID: GB104028046440). This water body is not designated as artificial or heavily modified and hydromorphology supporting elements support good status. The river is highly realigned in this area around historic industry and landfill and exhibits little natural form. The crossing point is also immediately upstream of the artificially impounded Lea Marston lakes (see **Figure 22-5, Sheets A to D**).

22.5.69 Heading east, the proposed pipeline crosses numerous small watercourses, all of which are unnamed on Ordnance Survey maps, and all of which are historically realigned through agricultural land, with little natural morphology. Only one of these is a WFD-monitored watercourse, namely the primary channel of the Dog Lane Brook from Source to R Tame Water Body that is crossed east of Lea Marston Lakes near the B4098 Coventry Road (see **Figure 22-5, Sheets A to D**). This is WFD waterbody ID GB104028042630, which is not designated as artificial or heavily modified, and hydromorphology supporting elements support good status.

22.5.70 West of Atherstone, the pipeline passes 100 m south of the artificial and impounded Merevale Lake, which is not a WFD water body and does not have a natural hydromorphology.

Water dependent terrestrial ecosystems and protected habitats

- 22.5.71 There is one potential GWDTE located within the Part 1b study area – the Whitacre Heath SSSI, located 20 m south of the Part 1b EIA Scoping Boundary (see **Figure 22-6, Sheets A to D**). A further GWDTE (River Blythe SSSI) located outside of the study area (approximately 2 km south of the Part 1b EIA Scoping Boundary) but that has the potential to be in hydraulic connection with Part 1b EIA Scoping Boundary via surface water tributaries.
- 22.5.72 Whitacre Heath SSSI is also a Surface Water Dependent Terrestrial Ecosystem (SWDTE). There is one other SWDTE SSSI located within the Part 1b study area: Kingsbury Wood SSSI featuring wetlands, located 800 m north of Hurley (see **Figure 22-6, Sheets A to D**).

Part 2: Works to the Coventry, Oxford and Grand Union Canals*Surface Water*

- 22.5.73 The key surface water bodies in the Part 2 study area are the Coventry, Oxford and Grand Union Canals themselves, as well as the watercourses they are connected to, as presented in **Figure 22-16**. The Watercourse Connection report (Ref. 75) discusses possible connections between the canals and other watercourses to be:
- a. Direct connections – where the canal and river flow into and out of the same channel;
 - b. Waste weirs and overflows – which includes weirs, sluices and flood paddles where excess water from the canal overtops a control structure to discharge into an adjacent watercourse;
 - c. Bed valves – sluices allowing drawdown of a canal pound; and
 - d. Feeders and inflows – includes direct connects and sluices, where water feeds the canal.

Coventry Canal

- 22.5.74 The Coventry Canal crosses several Ordinary Watercourses which are tributaries of the River Anker and the Wem Brook; it is connected to some of these tributaries via waste weirs.
- 22.5.75 The Coventry Canal is directly connected (no sluice) to the Ashby-de-la-Zouch Canal at the Marston junction, to the north-east of Bedworth.
- 22.5.76 The designated water bodies under WFD are presented in **Table 22-13** and also shown in **Figure 22-16, Sheets A to D**.

Table 22-13: WFD classification (River and canal waterbodies associated with the Coventry Canal within Part 2 study area)

Waterbody ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Ecological Status/Potential	Chemical Status ¹	Hydromorphological Designation
GB104028046430	Anker from Wem Brook to River Sence Water Body	57.56	Moderate	Moderate	Not assessed (Fail, 2019)	Not designated artificial or heavily modified
GB104028046460	Anker from River Sence to River Tame Water Body	94.154	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified
GB104028042430	Wem Brook from Source to River Anker Water Body	30.491	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified
GB70410212	Coventry and Ashby Canals Water Body	-	Good	Good	Not assessed (Fail, 2019)	Artificial
¹ In Cycle 3 (2022) of the RBMPs, the identified waterbodies did not require assessment for Chemical Status. For the previous RBMP cycle (2019) the Chemical Status for all identified waterbodies was 'Fail'.						

Oxford Canal

22.5.77 The Coventry Canal has a connection to the Oxford Canal, at Hawkesbury junction, where there is a lock.

22.5.78 The Oxford Canal has connections with the Clifton Brook, Rains Brook and Bragborough Brook (tributary of the River Leam) via waste weirs. The Oxford Canal is connected to the Withy Brook via a sluice. There are also a few waste weirs connected to small unnamed waterbodies near Stretton Under Fosse and Falls Bridge.

22.5.79 Bragborough Brook is connected to the Oxford Canal, although it is not designated under the WFD.

22.5.80 The WFD designated waterbodies with connections to the Oxford Canal are presented in **Table 22-14** and also shown in **Figure 22-16, Sheets D to I**.

Table 22-14: WFD Classification (River and canal waterbodies associated with the Oxford Canal within Part 2 study area)

Waterbody ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Ecological Status/ Potential	Chemical Status ¹	Hydromorphological Designation
GB109054044640	Withy Bk - source to conf R Sowe Water Body	32.09	Poor	Poor	Not assessed (Fail in 2019)	Not designated artificial or heavily modified
GB70910513	North Oxford Canal Water Body	-	Good	Good	Not assessed (Fail in 2019)	Artificial
GB109054044150	Raines Bk- source to conf R Leam Water Body	32.44	Poor	Poor	Not assessed (Fail in 2019)	Not designated artificial or heavily modified
GB109054043900	Clifton Bk - source to conf R Avon Water Body	32.696	Moderate	Moderate	Not assessed (Fail in 2019)	Heavily modified
¹ In Cycle 3 (2022) of the RBMPs, the identified waterbodies did not require assessment for Chemical Status. For the previous RBMP cycle (2019) the Chemical Status for all identified waterbodies was 'Fail'.						

Grand Union Canal

22.5.81 The Oxford Canal has a direct connection to the GUC at Braunston Junction.

22.5.82 The GUC crosses numerous watercourses and has connections to River Nene, the River Tove, the Loughton Brook in Milton Keynes, the Ledburn Brook, the River Great Ouse and the River Ouzel (see **Figure 22-16, Sheets I to V**). The WFD designated water bodies are presented in **Table 22-15** and also shown in **Figure 22-16, Sheets I to V**.

Table 22-15: WFD Classification (River and canal waterbodies associated with the GUC within Part 2 study area)

Waterbody ID	Waterbody Name	Operational Catchment (km²)	Overall Status	Ecological Status/Potential	Chemical Status¹	Hydromorphological Designation
GB109054044120	Leam - source to conf Rains Bk Water Body	62.907	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified
GB105032045310	Nene - headwaters to conf Whilton Branch Water Body	22.271	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified (supports good)
GB105032045360	Welton Village Trib, Whilton branch of R. Nene Water Body	42.367	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified
GB70910511	Grand Union Canal, Braunston to Leamington Spa Water Body	-	Moderate	Good	Not assessed (Fail, 2019)	Artificial
GB70510193	Grand Union Canal, Braunston summit Water Body	-	Moderate	Moderate	Not assessed (Fail, 2019)	Artificial
GB109054044120	Leam - source to conf Rains Bk Water Body	62.907	Poor	Poor	Not assessed (Fail, 2019)	Not designated artificial or heavily modified

Waterbody ID	Waterbody Name	Operational Catchment (km²)	Overall Status	Ecological Status/Potential	Chemical Status¹	Hydromorphological Designation
GB70510251	Grand Union Canal, Milton Keynes to Braunston summit Water Body	-	Moderate	Moderate	Not assessed (Fail, 2019)	Artificial
GB70510192	Grand Union Canal, Milton Keynes trough pound Water Body	-	Moderate	Moderate	Not assessed (Fail, 2019)	Artificial
GB105033038180	Tove (DS Greens Norton) Water Body	87.547	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily modified (supports good)
GB105033038000	Ouse (Wolverton to Newport Pagnell) Water Body	23.211	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily modified (supports good)
GB105033030520	Ouzel (US Clipstone Brook) Water Body	23.842	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily modified
GB105033030530	Ouzel Brook Water Body	25.891	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily modified
GB105033037971	Ouzel US Caldecote Mill Water Body	91.809	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily modified (supports good)

Waterbody ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Ecological Status/Potential	Chemical Status ¹	Hydromorphological Designation
GB70510191	Grand Union Canal, Tring summit to Milton Keynes Water Body	-	Moderate	Moderate	Not assessed (Fail, 2019)	Artificial
GB106038033391	Lee (from Luton to Luton Hoo Lakes) Water Body	64.732	Poor	Poor	Not assessed (Fail, 2019)	Heavily modified
¹ In Cycle 3 (2022) of the RBMPs, the identified waterbodies did not require assessment for Chemical Status. For the previous RBMP cycle (2019) the Chemical Status for all identified waterbodies was 'Fail'.						

22.5.83 There are seven public surface water abstractions licenses in the Part 2 study area; five of these are in the Part 2 EIA Scoping Boundary itself (see **Figure 22-12, Sheets A to K**).

22.5.84 Data on private surface water abstractions within the study area has been requested. Not all of this data has been made available at the time of completing the scoping; however, this data will be sourced and included within the next stage of the EIA.

22.5.85 The area from Watford to Hartwell is located within the Surface Water Safeguard Zone of the River Nene while the area north Daventry to Milton Keynes is located within the Surface Water Safeguard Zone of the River Great Ouse.

Hydrogeology

22.5.86 Geological and hydrogeological mapping indicates that the Part 2 study area is underlain by superficial deposits and bedrock geology with the relevant aquifer designations as outlined in **Table 22-16** and also shown in **Figure 22-18, Sheets A to V** and **Figure 22-19, Sheets A to V**. For BGS geological descriptions, see **Chapter 14: Ground Conditions**. Note that apart from those asterisked, all of these strata fall within the Part 2 EIA Scoping Boundary.

Table 22-16: Aquifer designations within Part 2 study area

Geological Strata	Aquifer Type
<i>Superficial Deposits:</i>	
*River Terrace Deposits	Secondary A
Alluvium	Secondary A
Head	Secondary undifferentiated
Glaciofluvial Deposits	Secondary A
<i>Bosworth Clay Member:</i>	
*Oadby Diamicton Member	Secondary undifferentiated
<i>Bedrock Geology:</i>	
Triassic Rocks (undifferentiated)	Secondary B
Lias Group	Secondary B
Great Oolite Group	Principal
Kellaways Formation	Unproductive strata
Oxford Clay Formation	Unproductive strata
Lower Greensand Group	Principal
Gault Formation	Unproductive strata
Upper Greensand Formation	Unproductive strata
Grey Chalk	Principal
White Chalk	Principal

* Found in study area but outside the Part 2 EIA Scoping Boundary.

- 22.5.87 Groundwater vulnerability mapping indicates a Medium to High risk within the Part 2 study area, with some areas of Low to Medium risk, particularly around Milton Keynes, from pollution, with a potential for the presence of solution features, which would enable a rapid movement of pollutants (see **Figure 22-22, Sheets A to V**). The underlying bedrock aquifer is mostly rocks with limited or no groundwater potential, except for small isolated and poorly connected areas of moderately productive aquifer found towards the southern boundary of the study area, which increase in frequency towards the south.
- 22.5.88 There are no SPZs for public groundwater supply abstractions within the Part 2 EIA Scoping Boundary and the associated study zone. The closest SPZ is approximately 4.8 km north-east of the study area boundary. The inner zone of the SPZ has a radius of around 1 km and is associated with public water supply abstraction managed by Anglian Water. A 2 km stretch classified as a zone 3 total catchment of this abstraction lies within the Part 2 study area near Leighton Buzzard.
- 22.5.89 There are six licenced groundwater abstractions for agriculture and industrial uses in the Part 2 study area, none which lie with the Part 2 EIA Scoping Boundary (see **Figure 22-18** and **Figure 22-19, Sheets A to V**).
- 22.5.90 Data on private groundwater abstractions within the Part 2 study area has been requested. Not all this data has been made available at the time of completing the scoping; however, this data will be sourced and included within the next stage of the EIA.
- 22.5.91 There are 11 EA discharge consents to groundwater within the Part 2 study area, these are mainly treated sewage effluent discharges from domestic, farm or commercial properties, one discharge consent is for groundwater remediation purposes. There are no drinking water safeguard zones (groundwater) within the Part 2 study area.
- 22.5.92 The Part 2 study area is located across multiple CAMS. This includes; the Tame Anker and Mease, Warwickshire Avon, Nene, Ouse Upper and Bedford CAMS areas.
- 22.5.93 The Part 2 study area is underlain by 5 WFD groundwater bodies, as outlined in **Table 22-17** and shown in **Figure 22-20, Sheets A to V**.

Table 22-17: WFD groundwater bodies and Classification (Part 2 study area)

Groundwater body ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Chemical Status
GB40402G990800	Tame Anker Mease-Secondary Combined	1140.57	Good	Good
GB40901G300700	Warwickshire Avon – PT Sandstone Warwick/Avon Confined	39.68	Poor	Good

Groundwater body ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Chemical Status
GB40902G990900	Warwickshire Avon-Secondary Mudrocks	2689.118	Good	Good
GB40502G402400	Nene Mid Lower Jurassic Unit	995.902	Good	Good
GB40502G401300	Upper Bedford Ouse Oolite	355.91	Good	Good
GB40401G302700	Tame Anker and Mease - Permo-Triassic Sandstone Nuneaton and Meriden	9.05	Good	Good

Flood Risk

22.5.94 The Risk of Flooding from Rivers and Sea (see **Figure 22-14, Sheets A to K**) and Risk of Flooding from Surface Water (see **Figure 22-13, Sheets A to V**) mapping shows that all three canals cross areas of Low to High flood risk.

22.5.95 A more detailed review of the Possible Working Areas, Possible Compounds and Access Roads has been carried out as these are considered to potentially have the most flood risk effects.

22.5.96 The Risk of Flooding from Rivers and Sea is Low at all Possible Working Areas, Access Roads Possible Compounds, with the exception of:

- a. Hillmorton Locks – where there is a Medium to High risk of flooding associated with the Clifton Brook to the Possible Working Area and Possible Compound;
- b. Braunston (Possible Compound only) – where there is Medium to High risk of flooding associated with the Bragborough Brook to the Possible Compound;
- c. Weedon STW – where there is a Medium to High risk of flooding associated with a tributary of the River Nene to the access road;
- d. Station, Blisworth – where there is a Medium to High risk of flooding associated with a tributary of the River Nene to the access road;
- e. Stoke Bruerne Lock flight – where there is a Medium to High risk of flooding associated with a tributary of the River Tove to the Possible Construction Area;
- f. Stoke Hammond – where there is a High risk of flooding associated with a tributary of the River Ouzel to the southern edge of one Possible Construction Area;
- g. Three Locks – where there is a High risk of flooding associated with the River Ouzel to the northern edge of one Possible Construction Area; and
- h. Leighton – where there is a Medium risk of flooding associated with the River Ouzel to the Possible Construction Area and Possible

Compound, and a Medium to High risk of flooding to the Access Road.

- 22.5.97 The Risk of Flooding from Surface Water mapping shows that many of the working areas have a Low to High risk of flooding, which is mostly associated with unnamed watercourses. The potentially affected areas are at Atherstone (Atherstone compound discharge), Nuneaton Road, Harborough, Hillmorton Locks, Braunston, Weedon STW, Heyford Fields Marina, Blisworth, Fenny Stratford, Three Locks, Stoke Bruerne Lock flight, Cosgrove Lock and Leighton (see **Figure 22-13, Sheets A to K**).
- 22.5.98 BGS's Susceptibility to Groundwater flooding map (see **Figure 22-21, Sheets A to V**) shows that the majority of the proposed working areas have "...*limited potential of groundwater flooding to occur*". Only areas at Braunston, the Stoke Bruerne Lock flight, Leighton and the Whilton Marina footbridge have '*potential for groundwater flooding to occur at surface level*'.
- 22.5.99 The Risk of Flooding from Reservoirs Map (see **Figure 22-15, Sheets A to V**) shows that most of the proposed working areas in Part 2 are not at risk of flooding from reservoirs. The Coventry Canal crosses an area around White Hall Farm which has a dry day reservoir flood extent (see **Figure 22-15, Sheet A**).
- 22.5.100 There is a residual risk of flooding from reservoirs, should the dam fail, to the Atherstone discharge compound, at Hillmorton Locks, Braunston, Weedon STW, the Stoke Bruerne Lock flight and at Cosgrove Locks.
- 22.5.101 For all of the Part 2 working areas there is a residual risk of flooding from the canals.
- 22.5.102 According to the Environment Agency's Historical Flood Maps and Recorded Flood Outlines (Ref. 74), there are no records of historic flooding events occurring in the Part 2 study area.

Hydromorphology

- 22.5.103 The Coventry, Oxford and Grand Union canals are all artificial water bodies with no natural hydromorphology.

Water dependent terrestrial ecosystems and protected habitats

- 22.5.104 There is one potential GWDTE located within the Part 2 study area. The Linnell Road LNR (940 m from the Hillmorton area) contains wetland habitats.
- 22.5.105 There are no water dependent SSSIs within the Part 2 study area. There are three water dependent Local Nature Reserves within the study area, namely, Wyken Slough, Newbold Quarry Park and Linnell Road.
- 22.5.106 There are four designated sites which contain wetland habitats located outside of the Part 2 study area but that have the potential to be in direct hydraulic connection with Part 2 – these are the Ensor Pool SSSI and SAC (1.1 km of the Part 2 EIA Scoping Boundary at Atherstone to Nuneaton), the Nares Gladley SSSI (1.4 km of the Part 2 EIA Scoping Boundary near Leighton Buzzard), the Swift Valley LNR (1.2 km of the Part 2 EIA Scoping Boundary at Bedworth to Rugby) and the Combe Pool

SSSI (2.7 km of the Part 2 EIA Scoping Boundary at Bedworth to Rugby), (see **Figure 22-17, Sheets A to V**).

Part 3: Daventry and Drayton Reservoirs

Surface Water

- 22.5.107 The only surface water bodies in the 1 km study area of Part 3 are the GUC, Daventry Reservoir, Drayton Reservoir themselves and a small reservoir feeder reservoir to Drayton Reservoir off Fawsley Drive, as presented in **Figure 22-16**.
- 22.5.108 Immediately outside the Part 3 study area, the GUC crosses the River Nene catchment with potential connections via waste-weirs. It also has a direct connection to the River Nene via Northampton Arm which starts at Gayton junction (approximately 21 km to the south-east).
- 22.5.109 The Daventry Reservoir is connected to the River Nene (Welton Village Trib, Whilton branch of R. Nene Water Body, ID: GB105032045360) (see **Figure 22-16, Sheet K**) which has a catchment area of 42.367 km². Its overall WFD status is Poor, based on its ecological potential which is Poor. Its chemical status has not been assessed (as of 2022). There are no gauging stations associated with this section of the watercourse.
- 22.5.110 The Drayton Reservoir is connected to the Grand Union Canal by a feeder channel.
- 22.5.111 There are no public surface water abstractions within the Part 3 study area (see **Figure 22-12**).
- 22.5.112 Data on private water abstractions within the study area has been requested. Not all this data has been made available at the time of completing the scoping; however, this data will be sourced and included within the next stage of the EIA.
- 22.5.113 There are three EA consented surface water discharge permits within the Part 3 study area (see **Figure 22-12, Sheets J and K**) associated with wastewater treatment.
- 22.5.114 The Part 3 study area (and the Part 3 EIA Scoping Boundary itself) is designated as a Drinking Water Safeguard Zone of the River Nene (Ref. 76) (see **Figure 22-12, Sheet K**).

Hydrogeology

- 22.5.115 Geological and hydrogeological mapping indicates that the Part 3 study area is underlain by the superficial deposits and bedrock geology with the associated aquifer designations as outlined in **Table 22-18** and also shown in **Figure 22-18, Sheets J and K** and **Figure 22-19, Sheets J and K**. For BGS geological descriptions, see **Chapter 14: Ground Conditions**. Note that these aquifer designations relate to superficial deposits and bedrock geology found underlying both the Part 3 EIA Scoping Boundary and study area.

Table 22-18: Aquifer designations within Part 3 study area

Geological Strata	Aquifer Type
<i>Superficial Deposits:</i>	
Alluvium	Secondary A
Glaciofluvial Deposits	Secondary A
Oadby Member	Secondary undifferentiated
<i>Bedrock Geology:</i>	
Charmouth Mudstone Formation	Secondary undifferentiated
Dyrham Formation	Secondary undifferentiated
Marlstone Rock Formation	Secondary A
Whitby Mudstone	Unproductive

- 22.5.116 Groundwater vulnerability mapping indicates that the Part 3 study area is predominantly mapped as being at medium risk from pollution across most of the Part 3 works including Drayton Reservoir and Braunston Transfer Pumping Station (see **Figure 22-22, Sheets J and K**). The mapping indicates that there is a High to Medium-High risk beneath most of Daventry Reservoir (see **Figure 22-22, Sheet K**), with a potential for the presence of solution features, which would enable a rapid movement of pollutants.
- 22.5.117 There are no SPZs for public groundwater abstractions located within the Part 3 study area. The nearest SPZ is located approximately 10 km to the north-west.
- 22.5.118 There are no licenced groundwater abstractions for other uses within the Part 3 study area (see **Figure 22-18, Sheets J and K**).
- 22.5.119 Data on private water abstractions within the study area has been requested. Not all of this data has been made available at the time of completing the scoping; however, this data will be sourced and included within the next stage of the EIA.
- 22.5.120 There are no records of any Environment Agency discharge consents to groundwater identified within the Part 3 study area. There are no drinking water safeguard zones (groundwater) within the Part 3 study area.
- 22.5.121 The Part 3 study area is located across two CAMS areas: the Anglian River Basin and the Severn River Basin. It also lies within the one WFD groundwater body, as outlined in **Table 22-19** and also shown in **Figure 22-20, Sheets J and K**.

Table 22-19: WFD groundwater bodies and Classification (Part 3)

Groundwater Body ID	Waterbody Name	Operational Catchment (km²)	Overall Status	Chemical Status
GB40902G990900	Warwickshire Avon-Secondary Mudrocks	2689.118	Good	Good

Flood risk

- 22.5.122 The Risk of Flooding from Rivers and Sea (see **Figure 22-14, Sheet K**) mapping shows that the Part 3 study area the range of flood risk is from Negligible to High. The High flood risk is associated with the River Nene, which has a mapped flood extent downstream of the Daventry Reservoir including the land adjacent to the GUC.
- 22.5.123 The Drayton Reservoir and its associated working area are not located in an area at risk of fluvial flooding. The Daventry Reservoir (1 km study area) and its associated working area are shown to be partially located within an area at Medium to High risk of fluvial flooding. Both reservoirs are shown in **Figure 22-14, Sheet K**.
- 22.5.124 The Risk of Flooding from Surface water mapping (see **Figure 22-13, Sheet K**) show that the risk ranges from Very Low to High within the Part 3 study area. The working area at the Daventry reservoir is shown to be at High risk of surface water flooding associated with overland flood flow pathways from the surrounding area.
- 22.5.125 BGS's Susceptibility to Groundwater flooding map (see **Figure 22-21, Sheets J and K**) shows that, within the study area, there is a "...potential for groundwater flooding to occur at surface level".
- 22.5.126 The Risk of Flooding from Reservoir mapping shows that should the dam fail on either the Drayton or Daventry Reservoir it would flood a considerable distance downstream. This puts the working areas, downstream of the reservoirs at a residual risk of flooding in the dam failure scenario, see **Figure 22-15**.
- 22.5.127 According to the Environment Agency's Historic Flood Maps (Ref. 74) Recorded Flood Outlines, there have been no flood events in the Part 3 study area.

Hydromorphology

- 22.5.128 Daventry and Drayton Reservoirs are artificial water bodies with no natural hydromorphology.
- 22.5.129 Daventry Reservoir and its outflow watercourse are mapped on the Catchment Data Explorer as a monitored watercourse of the Welton Village Trib, Whilton branch of R. Nene Water Body (ID: GB105032045360). Both the Daventry and Drayton reservoirs are artificial, having been constructed to feed the GUC. The reservoir outflow streams are highly modified and engineered until they discharge to the GUC 1 km downstream of Daventry Reservoir and 0.5km downstream of Drayton Reservoir. The GUC, in turn, has overflows into tributaries of the Whilton Branch – Lower Water Body of the River Nene. The tributaries appear to be realigned and straightened through agricultural land for some 3.5 km to the confluence with the Whilton Branch between the M1 and the village of Whilton. WFD groundwater bodies are presented on **Figure 22-20**.

Water dependent ecological features / protected habitats

22.5.130 There are no identified GWDTes located within the Part 3 study area nor outside of the study area with the potential to be in direct hydraulic connection (see **Figure 22-17, Sheets J to L**).

22.5.131 The Daventry Country Park, containing Daventry Reservoir itself, is identified as a Local Nature Reserve (LNR) and is located within Part 3 EIA Scoping Boundary (see **Figure 22-17, Sheets J to L**).

Part 4a: Abstraction, Storage and Treatment

Surface Water

22.5.132 The River Ouzel is the only Main River within the Part 4a study area. This river traverses Site B at the western edge of the site where it is WFD classified (Ouzel US Caldecote Mill water body); there are no main rivers within the Site H study area (see **Figure 22-29**).

22.5.133 There are six Ordinary Watercourses located within the Part 4a study area based on the OS open rivers data set: three within the study area associated with Site B and three within the study area associated with Site H.

22.5.134 For the study area associated with Site B, one of the three watercourses (an unnamed watercourse) is located within the EIA Scoping Boundary, traversing the site from east to west centrally through the site before joining the River Ouzel Main River to the west. The other two are within the wider study area of site B: an unnamed watercourse to the north of the study area flowing westwards into the River Ouzel, and a further unnamed watercourse joining the River Ouzel in the south of the Study area. None of the Ordinary Watercourses within the study area of Site B are WFD classified (see **Figure 22-29**).

22.5.135 For the study area associated with Site H, none of the three watercourses are located within the Part 4a EIA Scoping Boundary and all three are within the wider study area. An unnamed Ordinary Watercourse flows north directly adjacent to western extent of the Part 4a (Site H) EIA Scoping Boundary joining the River Ouzel within the north of the study area where the Ouzel is classified as an ordinary watercourse at this point in its catchment. The Ouzel is also WFD classified at this location (Ouzel US Clipstone Brook water body). The Whistle Brook is located within the western extent of the study area for Site H, joining the Ouzel Ordinary watercourse in the northern extent of the study area. The Whistle Brook is a WFD classified water body (see **Figure 22-29**).

22.5.136 The GUC, being the supply point for abstraction and treatment, traverses the Part 4a study area related to both sites: at Water Eaton, where it is present directly adjacent to Site B along the western site boundary, and to the west of Slapton, where it is located directly adjacent to Site H along the southern site boundary. The canal is a classified WFD Artificial Water body.

22.5.137 A summary of the WFD status or Potential for all of the WFD classified waterbodies within the Part 4a study area is provided in **Table 22-20**. The location of the WFD waterbodies is shown in **Figure 22-29, Sheet A and Sheet E**.

Other key features

- 22.5.138 There is one EA licensed surface water abstraction within the Part 4a study area for Site B (see **Figure 22-25, Sheet A**) from the River Ouzel at Great Brickhill, to the south of Mill Lane, for use in aquaculture.
- 22.5.139 There are no private surface water abstractions located within the study area for Part 4a.
- 22.5.140 There are two EA consented surface water discharge permits within the Part 4a study area (see **Figure 22-25, Sheets A and E**). One is located within the Part 4a study area for Site B for aquaculture discharge and the second is located within the Part 4a study area for Site H for sewage treatment effluent.
- 22.5.141 The Part 4a study area (and the Part 4a EIA Scoping Boundary itself) is located entirely within the designated Great Ouse Drinking Water Safeguard Zone. The Part 4a study area (and the Part 4a EIA Scoping Boundary itself) is not located within a designated Drinking Water Protected Area.

Table 22-20: WFD Classifications (Part 4a study area)

Waterbody ID	Waterbody Name	Operational Catchment (km²)	Overall Status	Ecological Status/ Potential	Chemical Status¹	Hydromorphological Designation
GB105033037971	Ouzel (US Caldecote Mill Water Body)	91.809	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)
GB70510191	Grand Union Canal, Tring summit to Milton Keynes Water Body	-	Moderate	Moderate	Not assessed (Fail, 2019)	Artificial
GB105033030520	Ouzel (US Clipstone Brook) Water Body	23.842	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)
GB105033030490	Whistle Brook Water Body	21.504	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)
¹ In Cycle 3 (2022) of the RBMPs, the identified waterbodies did not require assessment for Chemical Status. For the previous RBMP cycle (2019) the Chemical Status for all identified waterbodies was 'Fail'.						

Hydrogeology

- 22.5.142 Geological and hydrogeological mapping indicates that the Part 4a study area is underlain by the superficial deposits and bedrock geology with associated aquifer designations as outlined in **Table 22-21** and also shown in **Figure 22-31, Sheets A and E** and **Figure 22-32, Sheets A and E**. For BGS geological descriptions, see **Chapter 14: Ground Conditions**. Note that apart from those asterisked, all strata fall within the EIA Scoping Boundary.

Table 22-21: Aquifer Designations and geological strata in the Part 4a study area.

Geological Strata	Aquifer Type	Site Option
<i>Superficial Deposits:</i>		
Head (clay, silt, sand and gravel)	Secondary (undifferentiated)	Site B
Alluvium	Secondary A	Site B and H
Oadby Member - Diamicton	Secondary A	Site B and H
Glaciofluvial Deposits*	Secondary A	Site B
Glaciolacustrine Deposits	Secondary (Undifferentiated)	Site B
River Terrace Deposits	Secondary (Undifferentiated)	Site B
Sand and Gravel*	Secondary	Site B
<i>Bedrock:</i>		
Oxford Clay Formation	Unproductive strata	Site B
West Walton Formation	Unproductive	Site B
Woburn Sands Formation*	Principal	Site B
Gault Formation	Unproductive strata	Site H

- 22.5.143 The variable superficial deposits present across the Part 4a study area results in a range of aquifer vulnerability. Part of Site B is underlain by unproductive bedrock and no superficial deposits, but where superficial deposits are present, the vulnerability of groundwater in these deposits is Medium and is likely dictated by the soil cover type in the area.
- 22.5.144 In the wider study area for Site B, the underlying Woburn Sands Formation has high groundwater vulnerability while the unproductive strata are of low vulnerability. The aquifer vulnerability at Site H for the superficial deposits, varies from medium to high while that of the underlying bedrock (Gault Formation) is low due to the unproductive nature of the strata.
- 22.5.145 There are no SPZs for public groundwater abstractions identified in the study area for both Sites B and H. The closest SPZ is approximately 5.15 km south-east of Site B and approximately 9.5 km north-east of Site H.

There are no drinking water safeguard zones (groundwater) within both Sites B and Site H study areas, (see **Figure 22-31, Sheets A and E** and **Figure 22-32, Sheets A and E**).

- 22.5.146 There are no private water supply abstractions (local planning authority) or Environment Agency groundwater abstraction licenses located within the 1 km study area for Site B or Site H.
- 22.5.147 There are no Environment Agency Groundwater Discharge permits within either Site B or Site H's study area.
- 22.5.148 There are no WFD groundwater bodies or operational catchments underlying Site H. The majority of Site B does not have WFD groundwater bodies, but a very small area in the south of the study area falls under the WFD Operational catchment of Ouse Upper Bedford Woburn Sands, in association with the Upper Bedford Ouse Woburn Sands groundwater body as outlined in **Table 22-22** and presented in **Figure 22-33, Sheet A**.
- 22.5.149 Both Sites B and H are located within the Anglian River Basin CAMS area.
- 22.5.150 No GWDTE have been identified within the study area for Site B and H (see **Figure 22-30**).

Table 22-22: WFD groundwater bodies and Classification (Part 4a – Site B)

Groundwater Body ID	Waterbody Name	Operational Catchment (km2)	Overall Status	Chemical Status
GB40501G402200	Upper Bedford Ouse Woburn Sands	221	Poor	Good

Flood risk

- 22.5.151 The River Ouzel and its tributaries present the main fluvial source of flooding in the study area.
- 22.5.152 The Risk of Flooding from Rivers and Sea (see **Figure 22-27, Sheet A and Sheet E**) shows that the Part 4a study area is predominantly at a Low risk of fluvial flooding. There are two areas which are shown to be at a Medium to High risk of flooding; the first, located to the south east of West Bletchley where the River Ouzel passes through Site B to the west near the A4146 (**Figure 22-27, Sheet A**), and at Slapton where an un-named tributary of the River Ouzel passes directly adjacent to the west of Site H and the Whistle Brook and the River Ouzel flow within the Part 4a study area (see **Figure 22-27, Sheet E**).
- 22.5.153 The Risk of Flooding from Rivers and Sea mapping covers EA designated Main Rivers and some larger Ordinary Watercourses. There are several Ordinary Watercourses in the study area not covered by the rivers and sea mapping and hence the Risk of Flooding from Surface Water mapping can be used as an indication for these watercourses. This mapping (as shown on **Figure 22-26, Sheets A and E**) shows that there is Very Low risk of flooding for the majority of the Part 4a study area. The exceptions to this are:

- a. To the south of the A5 and A4146 roundabout junction approximately 0.61 km north of Site B (see **Figure 22-26, Sheet A**) – in this location there is predicted to be a Low to High risk of surface water flooding. Surface water ponding occurs to the east of the A4146 which causes a High risk of flooding. This flooding appears to be associated with an Ordinary Watercourse flowing from Little Brickhill west to the River Ouzel;
- b. To the south of the A4146 in the vicinity of Galley Lane (see **Figure 22-26, Sheet A**) – in this location there is predicted to be a Low to Medium risk of surface water flooding. Surface water ponding occurs in the west of Site B to the south of the A4146 which causes a Medium to High risk of flooding. This flooding appears to be associated with direct runoff from fields as well as an Ordinary Watercourse flowing from Great Brickhill west to the River Ouzel;
- c. In the Site B study area, South of Mill Lane and west of Stoke Road (see **Figure 22-26, Sheet A**) – in this location there is predicted to be a Medium to High risk of surface water flooding across the fields to the south of Mill Lane. This flooding appears to be associated with an Ordinary Watercourse/small drainage ditch flowing west to the River Ouzel;
- d. West of the GUC, at Slapton in the Site H study area (see **Figure 22-26, Sheet E**) – in this location there is predicted to be a Low to High risk of surface water flooding across the B488 and fields between the B488 and the GUC, to the west and south of Site H. Surface water ponding occurs adjacent to the GUC to the west which causes a Low to High risk of flooding. This flooding appears to be associated with direct runoff from fields and also Ordinary Watercourses and/or small drainage ditches flowing east to the GUC or passing beneath the GUC to the River Ouzel;
- e. East of the GUC, Slapton (see **Figure 22-26, Sheet E**) – in this location there is predicted to be a Low to High risk of surface water flooding across fields between the GUC and Site H with the western boundary of Site H predicted to be at Low risk of surface water flooding. This flooding appears to be associated with direct runoff from fields and also Ordinary Watercourses and/or small drainage ditches passing beneath the GUC and flowing north to the River Ouzel;
- f. East of Slapton in the Site H study area (see **Figure 22-26, Sheet E**) – in this location there is predicted to be a Low to High risk of surface water flooding associated with direct runoff from the urban area of Slapton, surrounding fields, and Whistle Brook; and
- g. Mill Lane, north of Slapton in the Site H study area (see **Figure 22-26, Sheet E**) – in this location there is predicted to be a Low to High risk of surface water flooding running from east to west crossing fields and Mill Lane. The area at risk of surface water flooding runs parallel to the River Ouzel corridor to the north and south, however the flooding extents differ from the fluvial flood risk extents along the Main River suggesting surface water flooding is associated with direct surface water runoff from the surrounding fields. Surface water is predicted to pool in some areas with lower topography in this area.

- 22.5.154 The Risk of Flooding from Reservoirs Map shows there is a residual risk of flooding from reservoirs (see **Figure 22-28, Sheet A and Sheet E**), should there be a failure when downstream water levels are 'normal' or when downstream water levels are high.
- 22.5.155 The BGS's Susceptibility to Groundwater flooding map (see **Figure 22-34, Sheet A**) shows that sections of Site B and the Part 4a study area has the "...potential for groundwater flooding to occur at surface" and the "...potential for groundwater flooding of property situated below ground level". Areas with no potential for groundwater flooding are also present within Site B and associated study area to the north and south. Mapping shows there to be "...limited potential for groundwater flooding" to the east and west of the Part 4a study area and Site B.
- 22.5.156 Site H and the Part 4a study area predominantly have no potential for groundwater flooding; however, the Part 4a study area has the "...potential for groundwater flooding to occur at surface" directly adjacent to the north, west and south of the Site H boundary (see **Figure 22-34, Sheet E**). The source of potential groundwater flooding to both Site B, Site H and the Part 4a study area is associated with the superficial deposits.
- 22.5.157 According to the Environment Agency's Historic Flood Maps and Recorded Flood Outlines (Ref. 74), there has been historic flooding associated with the River Ouzel south east of West Bletchley in the Part 4a study area. Part of the historic flood extent infringes on Site B to the west.

Hydromorphology

- 22.5.158 The River Ouzel (Ouzel US Caldecote Mill Water Body Water Body [WFD water body ID: GB105033037971]) crosses the Part 4a study area and Site B to the west of Little Brickhill. This water body is designated as heavily modified and hydromorphology supporting elements support good potential (see **Figure 22-29, Sheet A**).
- 22.5.159 The GUC passes through the Part 4a study areas at Water Eaton and west of Slapton in proximity to Site B and Site H. At these locations the GUC WFD waterbody is the Grand Union Canal, Tring summit to Milton Keynes Water Body (WFD water body ID: GB70510191). This water body is designated as artificial with no natural hydromorphology (see **Figure 22-29, Sheet A and Sheet E**).
- 22.5.160 Numerous small watercourses (based on Ordnance Survey mapping) cross the Part 4a study area and Site B, all of which are historically realigned through agricultural land, with little natural morphology. Two of these are WFD classified watercourses, namely the River Ouzel (US Clipstone Brook) Water Body (GB105033030520) that crosses the Part 4a study area north of Slapton and the primary channel of the Whistle Brook Water Body (GB105033030490), east of Slapton (see **Figure 22-29, Sheet E**). Both of these WFD waterbodies are designated as heavily modified, and hydromorphology supporting elements support good status.

Water dependent ecological features / protected habitats

- 22.5.161 There are no identified GWDTEs located within the Part 4a study area nor outside of the study area with the potential to be in direct hydraulic connection (see **Figure 22-30, Sheet A and Sheet E**).
- 22.5.162 There are no identified designated Nature reserves (LNRs, NNRs, SACs or SSSIs) located within the Part 4a EIA Scoping Boundary (see **Figure 22-30, Sheet A and Sheet E**).

Part 4b: Pipeline to Underground Reservoir near Luton

Surface Water

- 22.5.163 No Main Rivers cross the Part 4b EIA Scoping boundary; however, the River Ouzel, a Main River, and the GUC cross the western extent of the Part 4b study area (see **Figure 22-29, Sheets A to H**).
- 22.5.164 Six WFD waterbodies (see **Figure 22-29, Sheets A to H**) and three smaller Ordinary Watercourses (based on ordnance survey open rivers mapping) cross the Part 4b EIA Scoping boundary.
- 22.5.165 A summary of the status' under WFD for all of the classified waterbodies within the Part 4b study area is provided in **Table 22-23**.
- 22.5.166 There are no Environment Agency licenced surface water abstractions within the Part 4b study area (see **Figure 22-25, Sheets A to H**).
- 22.5.167 There are no private surface water abstractions located within the Part 4b study area.
- 22.5.168 There are 17 consented surface water discharge permits within the Part 4b study area (three located within the SP2 pipeline corridor and the remainder located within the wider Part 4b study area) with use in agriculture, commercial or water treatment (see **Figure 22-25, Sheets A to H**).
- 22.5.169 There are two Drinking Water Surface Water Safeguard Zones (surface water), the Great Ouse and the Lower Thames, within the Part 4b study area. The Part 4b study area (and the Part 4b EIA Scoping Boundary itself) is not located within a designated Drinking Water Protected Area (see **Figure 22-25, Sheets A to H**).

Table 22-23: WFD Classifications (Part 4b study area)

Pipeline Section	Waterbody ID	Waterbody Name	Operational Catchment (km²)	Overall Status	Ecological Status / Potential	Chemical Status¹	Hydro-morphological Designation
SP2, SP2A	GB105033037971	Ouzel (US Caldecote Mill Water Body)	91.809	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)
SP2, SP2A	GB70510191	Grand Union Canal, Tring summit to Milton Keynes Water Body	-	Moderate	Moderate	Not assessed (Fail, 2019)	Artificial
SP2, SP2B	GB105033037630	Clipstone Brook Tributary Water Body	15.315	Good	Good	Not assessed (Fail, 2019)	Heavily Modified (supports good)
SP2	GB105033037830	Clipstone Brook Water Body	30.473	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)
SP2, SP4, SP6, SP7	GB105033030530	Ouzel Brook Water Body	25.891	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)
SP6	GB105033030500	Eaton Bray Brook Water Body	20.768	Good	Good	Not assessed (Fail, 2019)	Heavily Modified (supports good)
SP6	GB105033030520	Ouzel (US Clipstone Brook) Water Body	23.842	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)
SP5, SP6	GB105033030490	Whistle Brook Water Body	21.504	Moderate	Moderate	Not assessed (Fail, 2019)	Heavily Modified (supports good)

Pipeline Section	Waterbody ID	Waterbody Name	Operational Catchment (km ²)	Overall Status	Ecological Status / Potential	Chemical Status ¹	Hydro- morphological Designation
¹ In Cycle 3 (2022) of the RBMPs, the identified waterbodies did not require assessment for Chemical Status. For the previous RBMP cycle (2019) the Chemical Status for all identified waterbodies was 'Fail'.							

Hydrogeology

22.5.170 Geological and hydrogeological mapping indicates that the Part 4b study area is underlain by superficial deposits and bedrock geology with the relevant aquifer designations, as outlined in **Table 22-24**, and shown in **Figure 22-31, Sheets A to H** and **Figure 22-32, Sheets A to H**. For BGS geological descriptions, see **Chapter 14: Ground Conditions**. Note that apart from those asterisked, all of these strata fall within the EIA Scoping Boundary.

Table 22-24: Aquifer designations within Part 4b study area

Geological Strata	Aquifer Type	Routes
<i>Superficial Deposits:</i>		
Head (clay, silt, sand and gravel)	Secondary (undifferentiated)	2, 2a, 2b, 5, *6, *7, *10a, 10b, 10c
Alluvium	Secondary A	2, 2a, 2b, 5, 6, 7
Oadby Member - Diamicton	Secondary A	*2, 2a, 2b, 5, 6
Glaciofluvial Deposits	Secondary A	*2a, *2b
River Terrace Deposits	Secondary (Undifferentiated)	*2a, 2b
Clay with Flints	Unproductive strata	10a, 10b, 10c
<i>Bedrock:</i>		
Oxford Clay Formation	Unproductive strata	2a
West Walton Formation	Unproductive strata	2a
Woburn Sands Formation	Principal	2a, 2b
Gault Formation	Unproductive strata	2a, 2b, 5, 6, 7
Gault Formation and Upper Greensands Formation (undifferentiated)	Unproductive strata	5
Upper Greensand Formation	Principal	5, 7
West Melbury Marly Chalk Formation	Principal	5, 7, 10a,
West Melbury Marly Chalk Formation and Zig Zag Chalk Formation (undifferentiated)	Principal	5
Totternhoe Stone Member	Principal	5, 10a,
Zig Zag Chalk Formation	Principal	5, 10a
Melbourn Rock Member	Principal	5, 10a
Holywell Nodular Vhalk Formation and New pit Chalk Formation (undifferentiated)	Principal	5, 10a, 10b, 10c
Chalk Rock Member	Principal	5, 10a, 10b, 10c
Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated)	Principal	5, 10a, 10b, *10c

**Located in Part 4b study area but outside the Part 4b EIA Scoping Boundary.*

- 22.5.171 The groundwater vulnerability map indicates medium to high vulnerability associated for the principal aquifers underlying the study area (see **Figure 22-35, Sheets A to H**). The groundwater vulnerability for the superficial deposits varies from medium to high. The high vulnerability is noted in areas of underlain by River Terrace Deposits and Alluvium. Where the bedrock is not a productive aquifer, it is of low vulnerability.
- 22.5.172 A total of six SPZs (Zone 1 and 2) are mapped within the Part 4b study area. The study areas for all the sub routes within Part 4b except routes 6 and 7 intersect these SPZs as shown on **Figure 22-31** and **Figure 22-32, Sheets A to H**.
- 22.5.173 There is a total of 13 Environment Agency abstraction groundwater licenses for public water supply found within the study area for Part 4b. The study area and the Part 4b EIA Scoping Boundary lies within the overall catchment for a further 15 groundwater abstraction licenses for public water supply sources.
- 22.5.174 There are 14 private water supply abstractions (local planning authority) within the Part 4b found in route 2a, 6, 10, 10a, 10b and 10c. Two of these are potable water supply abstractions located in zone 1 SPZ's (route 2a and route 10 c) with one of these directly underlying the Part 4b EIA Scoping Boundary (part 4 route 2a). A further four private water supply abstractions (local planning authority) are located in zones 2 or 3 of SPZ's, with use in agriculture, horticulture, domestic or industry.
- 22.5.175 There are 10 Environment Agency Groundwater discharge permits within the Part 4b study area. Water is discharged to ground via boreholes and soakaways.
- 22.5.176 The SPZ Zone 1 and 2 associated with the Sandhouse Public Water supply source lies across a small part of Part 4b in Route 2 and 2a. Four (4) boreholes under one EA abstraction licence for public water supply sources are associated with this SPZ. The total catchment (SPZ 3) for this and another public water source, approximately 5.7 km to the north of the route, underlies most of the route 2 EIA Scoping Boundary. A small area of SPZ 1 is mapped across the eastern part of the EIA Scoping Boundary for routes 2 and 2b associated with the Battlesden Public Water supply source. Six (6) boreholes under one abstraction licence for public water supply associated with this SPZ has been identified. Two (2) of these boreholes are just beyond the area of this SPZ mapping shown on **Figure 22-31, Sheets A to H** and **Figure 22-32, Sheets A to H**.
- 22.5.177 A small SPZ area lies within the route 10 EIA Scoping Boundary, this is associated with a licenced abstraction source for agricultural use.
- 22.5.178 There are a number of SPZ 2 and 3 associated with several public groundwater supply abstractions mapped routes 10, 10A, 10B and 10C EIA Scoping Boundaries. These designations including the total catchment area for these sources cover over 50% of the study area and the EIA Scoping boundary as shown on **Figure 22-31, Sheets A to H** and **Figure 22-32, Sheets A to H**. These are associated with up to five public water supply sources most of which are located outside the study area. Notably, one SPZ 1 and 2 area overlaps the study area for routes 10, 10B and 10C this is associated with the Runley Wood Public water supply

which lies within the study area for route 10C. Three abstraction licences for public water supply are associated with this SPZ zone.

- 22.5.179 There are two other abstraction licences within the Part 4B study area for routes 10 and 10B, both used for private water supplies as shown on **Figure 22-31, Sheets A to H** and **Figure 22-32, Sheets A to H**.
- 22.5.180 There are three EA Drinking Water Safeguard Zones (groundwater) identified in the study area along the Part 4b route 10 section. These cover approximately 40% of the route 10 study area and are associated with the multiple public water supply abstractions and SPZ's present across the area (see **Figure 22-31, Sheets A to H** and **Figure 22-32, Sheets A to H**).
- 22.5.181 There are a total of 10 Environment Agency discharge consents to groundwater within the Part 4b study area, these are mainly treated sewage effluent discharges from domestic, farm or commercial properties, one discharge consent is both treated sewage and trade effluent.
- 22.5.182 There are a number of ecosystem habitats that have been identified within the study area for Part 4b that are likely to be at least partially groundwater dependent. These include Kings Woods and Rushmere NNR (route 2a), Kings and Bakers Wood and Heaths SSSI (route 2a), Totternhoe Knolls Local Nature Reserve and SSSI (route 7), Dunstable and Whipsnade Downs SSSI (routes 5 and 10a), Kensworth Chalk Pit SSSI (route 10a) Cottage Bottom Fields LNR (route 10b), Dallow Downs and Winsdon Hill SSSI (route 10b and 10c) (see **Figure 22-30, Sheets A to H**).
- 22.5.183 Part 4b is located within the Anglian River Basin CAMS area.
- 22.5.184 There are a number of WFD designated groundwater bodies within the study area. The WFD groundwater bodies and their classifications are shown in **Table 22-25**.

Table 22-25: WFD groundwater bodies and classification (Part 4b study area)

Groundwater Body ID	Water body Name	Operational Catchment (km ²)	Overall Status	Chemical Status	Routes
GB40501G402200	Ouse Upper Bedford Woburn Sands	221	Poor	Good	2A 2B
GB40601G603000	Ouse Upper Bedford Chalk	352.88	Poor	Poor	5 7 10A
GB40601G601200	Mid-Chilterns Chalk	729.75	Poor	Poor	10A 10B 10C
GB40601G602900	Upper Lee Chalk	629.15	Poor	Poor	10B 10C

Flood risk

- 22.5.185 Ordinary Watercourses and their tributaries present the main fluvial source of flooding in the Part 4b study area.
- 22.5.186 The Risk of Flooding from Rivers and Sea (see **Figure 22-27, Sheets A to H**) shows that the Part 4b study area is predominantly located in an area not at risk of flooding from fluvial sources.
- 22.5.187 The western extent of the Part 4b study area, to the west of Little Brickhill, is at Medium to High risk of fluvial flooding from the River Ouzel (Main River) where the watercourse crosses the study area (see **Figure 22-27, Sheet A**).
- 22.5.188 The following six areas are shown to be at a Medium to High risk of flooding where larger Ordinary Watercourses cross the proposed pipeline:
- SP2 and SP2b where the Clipstone Brook Tributary crosses the pipeline corridor to the west of the A5 (see **Figure 22-27, Sheet C**);
 - SP2 where the Clipstone Brook crosses the pipeline corridor west of Hockliffe (see **Figure 22-27, Sheet C**);
 - SP2, SP6 and SP7 where the Ouzel Brook crosses the pipeline corridor to the southwest of the A505 in the vicinity of The Rye local road (see **Figure 22-27, Sheet D and Sheet E**);
 - SP5 where the Whistle Brook crosses the pipeline corridor south east of Slapton (see **Figure 22-27, Sheet E**);
 - SP6 where the confluence of the River Ouzel and Whistle Brook crosses the pipeline corridor north east of Slapton near Mill Lane (see **Figure 22-27, Sheet E**); and
 - SP10 where an un-named watercourse (a tributary of Eaton Bray Brook) crosses the pipeline corridor at Honeywick (see **Figure 22-27, Sheet D and Sheet F**).
- 22.5.189 The Risk of Flooding from Rivers and Sea mapping covers EA designated Main Rivers and some larger Ordinary Watercourses. There are several Ordinary Watercourses in the study area not covered by the rivers and sea mapping and hence the Risk of Flooding from Surface Water mapping can be used as an indication for these watercourses. This mapping (as shown on **Figure 22-26, Sheets A to H**) shows that there is Very Low risk of flooding for much of the proposed pipeline route. The exceptions to this are presented in **Table 22-26**.

Table 22-26: Locations of surface water flooding within the Part 4b study area

Pipeline Route	Location	Description
SP2	West of Little Brickhill	A Low to High risk of surface water flooding. This flooding is associated with an un-named watercourse and associated tributaries flowing from east to west across the pipeline corridor and Part 4b study area to the River Ouzel.

Pipeline Route	Location	Description
	South east of Little Brickhill near Watling Street, adjacent to the A5	A Low to High risk of surface water flooding. This flooding appears related to direct runoff from fields and the A5 with ponding shown in two locations adjacent to the A5. To the east of the A5 surface water flooding is likely associated with small Ordinary Watercourses.
	East and West of the A5 between Sandhouse Lane and Eastern Way	Areas of Low to High risk of surface water flooding. This flooding is associated with Ordinary Watercourses that pass beneath the A5 and one watercourse that passes beneath Eastern Way. There is predicted to be surface water ponding which causes a Low to High risk of flooding upstream of these crossing points. An Ordinary Watercourse (a tributary of the Clipstone Brook tributary) and associated Low to High surface water flood risk flows south within the SP2 pipeline corridor to the confluence with the Clipstone Brook tributary
	In the vicinity of Mill Road between Eggington and Stanbridge	Areas of Low to High risk of surface water flooding. This flooding appears associated with an Ordinary Watercourse that rises within the pipeline corridor and flows west across the Part 4b study area.
SP2A	South west of Great Brickhill near Galley Lane	An area of Low to High risk of surface water flooding. This flooding appears associated with an Ordinary Watercourse flowing within the pipeline corridor and west across the study area to the River Ouzel.
	East of Great Brickhill	An area of Low to High risk of surface water flooding. This flooding appears associated with small drainage ditches or flow routes across the pipeline corridor and direct runoff from surrounding fields which ponds within the study area to the north of Heath Road.
Intersection of SP2 and SP2A	Steeplane at the Steeplane and A5 roundabout junction	Areas of Low to High risk of surface water flooding. This flooding is associated with an Ordinary Watercourse that crosses the pipeline corridors and study area from north to south and direct runoff from the road network. In addition, there is predicted to be surface water ponding to the north east of the roundabout junction within the pipeline corridors which causes

Pipeline Route	Location	Description
		a Low to High risk of flooding upstream of these crossing points.
Intersection of SP2 and SP2B	East of the A5 north of Eastern Way	In this location there is predicted to be surface water ponding which causes a Low to High Risk of flooding to the east of the A5. This originates from direct runoff from the surrounding fields.
SP2 and SP2B	North west of Hockliffe near Mile Tree Road	Areas of Low to High risk of surface water flooding. Flooding at these locations is associated with the Clipstone Brook Tributary and associated Ordinary Watercourse flowing south west from Battlesden where it crosses the pipeline corridors and the Part 4b study area. Surface water flooding is also associated with direct runoff from surrounding fields with Low to High risk of surface water flooding flow routes crossing SP2 and the Part 4b study area to the south.
	North of the A4012	Areas of Low to High risk of surface water flooding. Flooding at these locations is associated with the Clipstone Brook as it crosses the pipeline corridors and Part 4b study area.
SP2	East of the A5 in the vicinity of Stanbridgeford Wastewater Treatment Works	A large area of Low to High risk of surface water flooding. Flooding at this location is associated with the Ouzel Brook that crosses the pipeline corridor and smaller Ordinary Watercourses within the Part 4b study area in proximity to the pipeline corridor. Surface water flooding is also associated with direct runoff from surrounding fields with Low to High risk of surface water flooding flow routes and ponding within the pipeline corridor and within the Part 4b study area upstream of the A5 to the east and to the south west.
SP5	South east of Slapton	Areas of Low to High risk of surface water flooding. Flooding at this location is associated with the Whistle Brook as it crosses the pipeline corridor. Surface water flooding is also associated with direct runoff from surrounding fields with Low to High risk of surface water flooding flow routes and ponding within the pipeline corridor and across the Part 4b study area to the north and south.
	Between South End Lane and	Areas of Low to Medium risk of surface water flooding. Flooding at this location is

Pipeline Route	Location	Description
	Hartop Close/High Street	associated with Ordinary Watercourses within the Part 4b study area to the north and south of the pipeline corridor with associated flow routes across fields between the watercourses that cross the pipeline corridor.
	South east of Edlesborough in the vicinity of Tring Road	Areas of Low to High risk of surface water flooding. Flooding at this location is associated with the River Ouzel as it crosses the pipeline corridor.
SP6	North east of Slapton near Mill Road	Areas of Low to Medium risk of surface water flooding. Flooding at this location is associated with the confluence of Whistle Brook with the River Ouzel located within the pipeline corridor. Further areas of Low to High risk of surface water flooding and ponding are present directly north of the pipeline corridor, associated with an Ordinary Watercourse flowing from west to east across the Part 4b study area and direct runoff from the surrounding fields.
SP6 and Intersection of SP6 and SP7	Between B440 and the intersection with SP7 south of Stanbridge Road	Extensive areas of Low to High risk of surface water flooding within the pipeline corridor. Flooding at this location is associated with the confluence of Eaton Bray Brook with the River Ouzel (located within the pipeline corridor) in the vicinity of The Rye and the River Ouzel flowing north east to south west within the pipeline corridor. Further areas of Low to High risk of surface water flooding, flow routes and ponding are present to the north, south and east of the pipeline corridor, associated with Ordinary Watercourses and direct runoff from the surrounding fields within the Part 4b study area.
SP7	North of The Rye	In this location there is predicted to be surface water ponding which causes a Low to High risk of flooding. This originates from direct runoff from surrounding fields and smaller Ordinary Watercourses located within the pipeline corridor and Part 4b study area.
SP10	North east of Edlesborough in the vicinity of Bower Lane and Dunstable Road	Areas of Low risk of surface water flooding. Flooding at this location is associated with direct runoff from surrounding fields and Ordinary Watercourses located both within the

Pipeline Route	Location	Description
		pipeline corridor and the Part 4b study area.
	Tring Road, east of Edlesborough	Areas of Low to High risk of surface water flooding. Flooding at this location is potentially associated with a small Ordinary Watercourse and ponding of direct runoff from surrounding fields located within the pipeline corridor.
	B4541 north of Whipsnade	Area at Low risk of surface water flooding. Flooding at this location is associated with the upper reach of a small Ordinary Watercourse that crosses the pipeline corridor and the Part 4b study area to the south.
	Between Common Road and the A5183	Areas of Low to High risk of surface water flooding. Flooding at these locations is potentially associated with the upstream reaches of Ordinary Watercourses (tributaries of the River Colne) that cross the pipeline corridor and Part 4b study area to the south.
	East of the A5183 near Dunstable Road	Area of Low to High risk of surface water flooding. Flooding at this location is potentially associated with the upstream reach of an Ordinary Watercourse (tributary of the River Colne) that crosses the pipeline corridor and Part 4b study area from north to the south.
SP10, SP10B	Vicinity of Dunstable Road, south west of Caddington	Area of Low to High risk of surface water flooding. Flooding at this location is potentially associated with the upstream reach of an Ordinary Watercourse (tributary of the River Ver) that crosses the pipeline corridors and Part 4b study area from north west to the south east.
SP10, SP10B and SP10C intersection	Vicinity of Underground Reservoir near Luton Road	Area of Low to Medium risk of surface water flooding. Flooding at this location is associated with direct runoff from the surrounding fields and Underground Reservoir near Luton Road both within the pipeline corridors and Part 4b study area. A Low risk surface water flow route runs from west to east within the SP10C pipeline corridor.
SP10, SP10C	South of Underground Reservoir near Luton to the south	Areas of Low to High risk of surface water flooding. Flooding at this location is potentially associated with an Ordinary Watercourse (tributaries of the River Colne) that crosses the pipeline corridors

Pipeline Route	Location	Description
	of Mallard Crescent	and Part 4b study area from north west to south east. There is predicted to be surface water ponding which causes a Low to High risk of flooding within the residential development to the north of the pipeline corridor and west of Chaul End Road in the Part 4b study area.

- 22.5.190 The Risk of Flooding from Reservoirs Map shows there is a small area at residual risk of flooding from reservoirs within the Part 4b study area to the east of the A5 at Little Brickhill (SP2) (see **Figure 22-28, Sheets A to H**), should there be a failure when downstream water levels are 'normal'. If the downstream water levels are high the flood depths and extents are predicted to be greater.
- 22.5.191 The BGS's Susceptibility to Groundwater flooding map (see **Figure 22-34, Sheets A to H**) shows that most of the proposed pipeline to the north west of the Clipstone Brook Tributary (SP2 and SP2A), most of the proposed pipeline to the east of Honeywick and Slapton (SP5, SP10, SP10A, SP10B and SP10C), a section of the proposed pipeline corridor at Slapton (SP2) and the associated Part 4b study area has "...*limited potential for groundwater flooding to occur*". For the remaining proposed pipeline corridors and Part 4b study area the mapping shows there to be either "...*no potential for groundwater flooding to occur*" or "...*potential for groundwater flooding to occur at the surface*".
- 22.5.192 The source of potential groundwater flooding is predominantly associated with the superficial deposits. In the areas identified to have limited potential for groundwater flooding (to the northern and southern areas of the proposed pipeline and Part 4b study area) however, the source of potential groundwater flooding is associated with clearwater flooding, a form of groundwater flooding caused by "...*the water table in an unconfined aquifer rising above the land surface in response to extreme rainfall*".
- 22.5.193 According to the Environment Agency's Historic Flood Maps and Recorded Flood Outlines (Ref. 74), there has been no historic flooding associated with watercourses crossing the pipeline corridor. Within the Part 4b study area historical flooding is associated with the River Ouzel at Water Eaton to the east of SP2 and SP2A.

Hydromorphology

- 22.5.194 The proposed pipeline route crosses eight WFD waterbodies (see **Figure 22-29 Sheet A to H**). A summary of the status' under WFD for all of the designated waterbodies within the Part 4b study area is provided in **Table 22-23**.
- 22.5.195 The River Ouzel (Main Watercourse) and six of the identified WFD waterbodies (Ordinary Watercourses) are designated as heavily modified and hydromorphology supporting elements support good status. The GUC is designated as an artificial waterbody.

- 22.5.196 The proposed pipeline crosses numerous small watercourses, all of which are unnamed on Ordnance Survey maps, some of which are historically realigned through agricultural land, with little natural morphology and some retaining their natural morphology.

Water dependent terrestrial ecosystems and protected habitats

- 22.5.197 There are several potential GWDTE (for at least part of the year) located within the Part 4b study area. These include Kings Woods and Rushmere SSSI, Totternhoe Knolls Local Nature Reserve, Dunstable Downs, Cottage Bottom Fields, and a number of unnamed SSSIs (see **Figure 22-30, Sheets A to H**).
- 22.5.198 Kings Woods SSSI is also a Surface Water Dependent Terrestrial Ecosystem (SWDTE) located within the SP2 and SP2A study area, featuring wetlands, including wet woodlands and marsh grasslands (see **Figure 22-30, Sheets A and B**).

Future Baseline

- 22.5.199 By 2032, at the first year of full operation, there are likely to be several hydrological changes in water bodies and degree of flood risk relevant to the Proposed Development. This includes influences from future abstractions, climatic changes, improvements in wastewater management and implementation of catchment scale measures which improve the condition of water bodies.
- 22.5.200 A key aspect of change is planned improvements in the quality of treated WwRC discharges to watercourses alongside changes in the frequency and quality of Combined Sewer Overflows (CSO); these changes are required by several legislative and policy drivers. In particular, discharges to the rivers Tame and Trent are to be improved by a series of planned WwRC measures to reduce Phosphorus load during the current water company current Asset Management Period (AMP) which runs to 2030. This will aim to improve the future water quality of the Tame and Trent rivers, alongside ongoing measures within many catchments of the overall study area to improve all water bodies. Further water quality modelling is proposed for the Tame and Trent to determine the potential future water quality baseline to support the EIA, and the full WFD assessment will account for potential WFD status changes within catchments and groundwater bodies with impact pathways to account for this future baseline.
- 22.5.201 Climate change is also likely to affect the hydrology of identified surface water features, groundwater bodies and flood risk extent and frequency. The scale of change is likely to be small at the start of the initial future baseline (first year of operation, 2032) compared to the current baseline, but throughout the lifetime of the Proposed Development, climate change is likely to result in a material future change which needs to be considered for the lifetime of the scheme operation. Therefore, further climate change influenced hydrological and hydraulic modelling scenarios for the River Tame, River Trent and GUC will be undertaken to support further assessments of hydrological impact from the Proposed Development throughout its lifetime.

- 22.5.202 Climate change will also need to be considered with respect to changes in flood risk both to the Proposed Development, but also where it could change flood risk elsewhere. The FRA will consider climate change allowances to the 2080's epoch (defined by the Environment Agency as the time period from 2070-2125) for peak river flows, and the 2070's epoch (2060-2080) for peak rainfall (Ref. 64).

Previous Assessments and Reports

- 22.5.203 A significant amount of investigation work relating to the water environment has been undertaken as part of the RAPID gated process. This work has helped inform the proposed scope presented in this EIA Scoping Report chapter. A brief synopsis of the key recent investigations relevant to matters covered in this water environment and flood risk topic are presented in **Table 22-27**.

Table 22-27: Summary of previous water environment investigations and reports

Title, author, date & RAPID Gate stage	Reference	Synopsis and relevance to the investigation
Grand Union Canal SRO Gate 2: Hydraulic Model Upgrade (JBA, 2022)	Ref. 77	Modelling was carried out for the Grand Union Canal (GUC) strategic resource option (SRO) as part of RAPID Gate 2. This built upon models constructed as part of Gate 1 to understand the impact of the water levels, surge, velocity and waste weir spills of the SRO. At Gate 2 a new Flood Modeller Pro model was built of the canal network from Lock 13 on the Coventry Canal to Lock 30 – Slapton on the GUC, south of Leighton Buzzard. The results and recommendations from this piece of work have been referred to in the scoping of the potential effect on flood risk elsewhere and mobilisation of sediments.
Grand Union Canal Strategic Resource Option Watercourse Connections (Mott MacDonald, 2022) – Gate 2	Ref. 75	The purpose of the report was to document all the canal-watercourse connections to provide information to the Gate 2 environmental assessments. This report provides maps of the connection locations along with their likely scale of influence on the Gate 2 environmental assessments.
GUC SRO Gate 2 Water Quality Modelling Phase 1 (JBA, 2022) – Gate 2 GUC SRO Gate 2 Water Quality Modelling Phase 3 & 4 (JBA, 2022) – Gate 2	Ref. 78 Ref. 79	This piece of work involved two strands of water quality modelling and built upon investigations carried out during Gate 1. One strand used the Environment Agency's River Quality Planning (RQP) suite of tools to assess the impact of the proposed transfer of Minworth recycled water at the point of discharge to the Coventry Canal at Atherstone. The second strand was hydrodynamic water quality modelling of the canal to assess dilution of the discharge recycled water over a long flow time series. The results and recommendations from this piece of work has been referred to in the scoping of the potential effect on water quality presented in this EIA Scoping Report chapter.
GUC SRO Habitats and Protected Species Desk Study, (Mott MacDonald, 2022) – Gate 2	Ref. 80	This study was carried out to provide an indication of the likely issues and constraints around protected and notable habitats, flora and fauna associated with the SRO and included habitat surveys. The evidence and recommendations obtained by this study have been

Title, author, date & RAPID Gate stage	Reference	Synopsis and relevance to the investigation
		referred to in the scoping of the potential effects on water-dependent habitats presented in this EIA Scoping Report chapter.
Minworth SRO Water Quality – Baseline Monitoring and Modelling (AECOM, 2022) – Gate 2	Ref. 81Ref. 81	This report documents the methodology and results of baseline water quality monitoring and water quality modelling of the River Tame and Trent, in support of the Minworth SRO. The objectives of this work were to: • Provide a robust impact assessment of the discharge reduction from Minworth into the Rivers Tame and Trent system and surrounding environment and assess the impact the proposed transfer could have on aquatic ecology; • Define what mitigation measures need to be implemented to satisfy regulators that the SROs are viable; • Support engagement with key stakeholders including the Environment Agency, Natural England, Canal and River Trust, Water Resources East, and the River Trent Working Group; • Produce an environmental scoping checklist; and • The results and recommendations from this assessment have been used in the scoping of the effects on surface water quality presented in this EIA Scoping Report chapter.
Hydrological and Hydraulic Modelling for the Tame and Trent (AECOM, 2022) – Gate 2	Ref. 82	The aim of this study was to quantify the potential hydrological and hydraulic changes to the River Tame and Trent as a result of operating several SROs which would reduce flow in the river system. This was carried out using an Aquator model of the study area, four 1D Flood Modeller Pro hydraulic models of the river system and targeted 2D TUFLOW models at barriers to fish migration. Aquator modelling allowed quantification of the impact on daily flows and the availability of water for other abstractors. The 1D hydraulic models were used to establish if the SROs would affect in-stream water levels and velocities throughout the river system as well as connectivity to water-dependent habitats. The 2D models were used to determine if flow reductions over features such as weirs would impact on fish migration potential in the

Title, author, date & RAPID Gate stage	Reference	Synopsis and relevance to the investigation
		river system. The results and recommendations relating to the effects on water availability for other abstractors have been referred to in this EIA Scoping Report chapter.
Hydromorphological assessment for Daventry and Drayton Reservoirs – Draft for Gate 3 (as yet unpublished)	-	A study was carried out for Gate 3 to help understand if the altered operational regime of the Daventry and Drayton Reservoirs (to be used as a storage options for the Proposed Development) may present risks or benefits to downstream watercourses, for example in terms of scour, sedimentation, and physical habitat quality. This included a hydromorphological walkover and habitat assessment of the potentially impacted watercourses. The results and recommendations relating to sediment mobilisation have been referred to in this EIA Scoping Report chapter.
Minworth AWTP and pipeline flood risk assessment – Gate 2 (unpublished) and Draft at Gate 3 (as yet unpublished)	-	FRAs have been produced to provide site-specific assessment of flood risk for the AWTP options at Minworth and the pipeline transfer to Atherstone; these were produced at Gate 2 (unpublished) and in draft at Gate 3 (as yet unpublished). The results and recommendations from these assessments have been used in the scoping of flood risk presented in this EIA Scoping Report chapter.
GUC Transfer assessment of sediment and flow impacts (unpublished) – Gate 2	-	The results from hydraulic modelling and sediment sampling have been used to assess the influence of the SRO on mobilising sediment within the canal network. The results and recommendations from this assessment have been used in the scoping of the potential effect of sediment mobilisation presented in this EIA Scoping Report chapter.
Minworth SRO Water Framework Directive assessments, GUC (AECOM 2022) & Tame & Trent (Mott MacDonald, July 2022) – Gate 2	Ref. 83	WFD assessment of the potential water body impacts relating to the SRO was completed at Gate 2. This includes five WFD waterbodies on the Tame and Trent, namely the Grand Union Canal WFD waterbody. The outcomes of these assessment have been referred to in the scoping of the potential effects on surface water presented in this EIA Scoping Report and have informed the WFD Scoping Report included in Appendix 7-2 in Volume 3 of this EIA Scoping Report.

Title, author, date & RAPID Gate stage	Reference	Synopsis and relevance to the investigation
Hydrological and Hydraulic Modelling for the Tame and Trent SRO – Draft for Gate 3 (as yet unpublished)	-	This is an update and extension of scope to the Gate 2 hydraulic modelling completed in 2022 (see Ref. 82). One of the key updates to the hydraulic modelling at Gate 3 was to allow for the addition of climate change factors to provide a more robust future baseline. In addition, further 2D hydraulic models were developed at all remaining River Trent structures which act as barriers to fish passage, to ensure detailed modelling was available to inform the assessment fish passage in the River Trent (referred to in Chapter 12: Ecology – Aquatic).
Environmental assessment undertaken for GUC & Minworth SROs – Draft for Gate 3 (as yet unpublished)	-	These reports will summarise the updated Gate 3 results and recommendations of Environmental Assessments for the Tame and Trent and the GUC. The water environment related effects assessed via these reports have been considered in this EIA Scoping Report.
Water Dependent Habitats Connectivity Report – River Tame. Draft for Gate 3 (as yet unpublished)	-	This report uses 1D hydraulic modelling and site survey to determine whether flow changes and river level changes in the River Tame through operation of the SRO could affect connectivity to water dependent habitats in the Tame catchment.
GUC SRO Environmental Assessment Habitat Regulations Assessment – Draft for Gate 3 (as yet unpublished)	-	This assessment specifically aimed to understand the potential impact on habitats sites (i.e. SAC, candidate SAC, SPA, potential SPA, compensation sites and Ramsar sites) in relation to the GUC SRO. The study area was defined as a 10 km buffer around the canal network. The evidence and recommendations gathered in this study have been referred to in the scoping of the potential effects on water-dependent habitats mentioned in Section 22.6 of this chapter and have informed the HRA Screening Report included in Appendix 7-1 in Volume 3 of this EIA Scoping Report.

22.6 Potential Effects

Construction Phase

- 22.6.1 The scoping of potential effects from the Proposed Development during the construction phase is presented within **Table 22-28**.

Table 22-28: Potential effects during the construction phase – Water Environment and Flood Risk

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Deterioration of groundwater quality in aquifers, GWDTEs, abstraction points and WFD water bodies by accidental spillage or uncontrolled construction runoff	In	All	Construction works have the potential for the accidental release of fuels, oils and lubricants, indirectly via connected surface water bodies or into the ground and migrate towards and reach the water table, within the underlying aquifer, or directly via the aquifer. Where excavation works are required or there is a lack of superficial deposits, the risk of pollution becomes heightened. Off-site construction of materials will act to reduce the probability of groundwater pollution.
Disturbance of existing contamination in groundwater	Out	All	Construction works have the potential to disturb existing contamination within the ground, which could then migrate towards and reach the water table within the underlying aquifer. Scoped out for this chapter as this is included as part of the scope in Chapter 14: Ground Conditions .
Deterioration of groundwater quality in aquifers, GWDTEs, abstraction points and WFD waterbodies by disturbance of existing contamination	Out	All	The accidental release or disturbance of existing contamination has the potential to impact on groundwater quality directly within the underlying aquifer, and indirectly at connected receptors, such as GWDTEs and abstraction points (public and private water supplies). Scoped out for this chapter as this is included as part of the scope in Chapter 14: Ground Conditions .
Changes in groundwater levels and flows in aquifers, GWDTEs, abstraction points and WFD waterbodies	In	All	Groundwater flows and levels could be impacted by below ground construction works, and by dewatering activities, directly by altering natural groundwater flow pathways within the underlying aquifer, or indirectly by altering groundwater contributions to GWDTEs and abstraction points (public and private water supplies). This impact is likely to be regional and localised around the proximity of the works; however, may have impacts on Public Water Supply (PWS) and base flow conditions to rivers.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Increased risk of groundwater flooding	In	All	Where natural groundwater flows and levels are altered, there is the potential for an increased risk of groundwater flooding. This may be heightened where the water table is close to the ground surface and excavated material which would act as groundwater storage is removed.
Changes to surface water flows from impacting groundwater	In	All	Changes to groundwater flow direction and patterns may act to alter surface water flows. Where wetland habitats exist, groundwater and effluent may act to stabilise surface water flows and increase base flow to nearby rivers (Part 1b, River Tame). Pumping or dewatering of groundwater levels may act to reduce surface water and base flows.
Construction works may affect surface water / watercourse flow patterns and sediment mobilisation	In	All	There may be temporary risks associated with flow diversions or sediment mobilisation into watercourses during the construction phase.
Increase risk in fluvial or surface flooding	In	All	Temporary works may alter above ground flow pathways or increase surface water runoff which may increase flooding elsewhere. Potential for siltation and blockages within the drainage systems causing failure or improper function, which could impact hydrology through flooding. Temporary increase in flooding through localised impoundments or diversions of river, canal and/or reservoirs flows.
Increase in residual risk of flooding from reservoirs	In	Parts 2 and 3	Temporary works downstream of the reservoir may cause temporary changes to downstream flood flow pathways putting different or more receptors at a residual risk of flooding. Temporary works could also undermine the integrity of the dam, causing an increase in the likelihood of failure.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
	Out	Parts 1a, 1b, 4a and 4b	Parts 1a, 1b, 4a and 4b are not located in proximity to the risk of flooding from reservoirs flood extents associated with the Daventry and Brayton reservoirs (Parts 1a and 1b are approximately 43 km north-east and Parts 4a and 4b are approximately 42 km south-west).
Increase risk of flooding from canals	In	Parts 2 and 4a	Temporary works may cause localised impoundments or disturbance of banks leading to an increase in the residual risk of flooding or increase in spills over waste weirs impacting surrounding watercourses.
	Out	Parts 1a, 1b, 3 and 4b	No temporary works to the canals are proposed in Parts 1a, 1b, 3 and 4b.
Impacts on surface water quality	In	All	Due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals (including 'frac-out' events leading to spillage of drilling fluids during shallow non-intrusive trenchless crossing installations operations), or through mobilisation of contamination following disturbance of contaminated ground or groundwater, or through uncontrolled site run-off. Due to disturbance of river and/or canal bed sediment which may be contaminated and/or decrease dissolved oxygen due to disturbance of organic matter. Earthworks during construction and the presence of permanent infrastructure could alter surface water flows.
Deterioration of surface water dependent terrestrial ecosystems (SWDTE) and protected sites	In	All	There are SWDTEs in all study areas. The impact of construction works on these will need to be assessed. The Gate 3 assessment reports covering this aspect will be reviewed once they are published, which will further inform the scope.

Operational Phase

22.6.2 The scoping of potential effects from the Proposed Development during the operational phase is presented within **Table 22-29**.

Table 22-29: Potential effects during the operational phase – Water Environment and flood risk

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Deterioration of groundwater quality in aquifers, GWDTEs, abstraction points and WFD waterbodies by accidental spillage	In	All	Planned and unplanned operational maintenance works, including pipeline washouts, have the potential for the accidental release of fuels, oils and lubricants, indirectly via connected surface water bodies or into the ground and migrate towards and reach the water table, within the underlying aquifer, or directly via the aquifer.
Changes in groundwater levels and flows in aquifers, GWDTEs, abstraction points and WFD waterbodies	In	All	While the modification of existing waste weirs will prevent loss of premature discharge to adjacent connected rivers in Part 2 of the Proposed Development, permanent above ground infrastructure still has the potential to change the recharge rate of rainfall to the underlying aquifers, while permanent below ground infrastructure has the potential to alter natural groundwater flow pathways. There is also potential for higher canal operating levels to alter groundwater levels locally through increased leakage in some locations.
Reduction in water available for abstractors from the Rivers Tame and Trent	In	Part 1a	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development has the potential to reduce available water in the Rivers Tame and Trent, affecting abstractors from those River Systems, particularly where the change in hydrological regime could change the frequency with which 'Hands off Flow' conditions are triggered for abstraction licences. Modelling during the gated RAPID process has identified that storage mitigation in the Daventry and Drayon Reservoirs has the potential to mitigate this effect and is to be developed and considered further as part of the EIA.
	Out	Parts 1b, 2, 3, 4a and 4b	Abstractions located within Parts 1b, 2, 3, 4a and 4b are not sourced from the Rivers Tame and Trent.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
Sediment transport changes and hydro-ecological condition deterioration in the Rivers Tame and Trent	In	Part 1a	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development has the potential to change water levels and flow velocities at lower flows in the Rivers Trent and Tame. These changes could affect sediment transport and affect hydromorphological condition/habitat availability for some sections of the rivers. Modelling during the gated process has identified that these changes are likely to be limited; however, further modelling is being undertaken to understand this impact pathway whilst making an allowance for climate change for the future baseline assessment.
	Out	Parts 1b, 2, 3, 4a and 4b	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development in Parts 1b, 4a and 4b does not have the potential to change water levels and flow velocities at lower flows in the Rivers Trent and Tame, therefore sediment transport etc will not be affected.
Deterioration of water quality in the Rivers Tame and Trent, the canal network and the Daventry and Drayton Reservoirs	In	Parts 1a, 2 and 3.	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development has the potential to change water quality in the Rivers Tame and Trent by altering pollutant loads and dilution. Likewise, discharges of treated water to the canal network, and abstraction into the Daventry and Drayton Reservoirs has the potential to impact water quality in these features. This includes changes in key sanitary determinants, dissolved oxygen and other polluting substances. Modelling undertaken during the gated RAPID process has identified that these impacts can be mitigated or are minimal; however further modelling and assessment is being undertaken to understand this impact pathway whilst making an allowance for climate change.
	Out	Parts 1b, 4a and 4b	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development in Parts 1b, 4a and 4b does not have the potential to change water levels and flow velocities at lower

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			flows in the Rivers Trent and Tame due to these being controlled sites (Part 4a abstraction, treatment and storage) or passages (i.e. Parts 1b and 4b pipelines), therefore water quality will not be affected.
Enhanced biological benefit	In	All	Creation of wetland habitats as part of Part 1a of the Proposed Development will aid in groundwater stability which support GWDTEs. Any enhancement proposed by other parts of the Proposed Development will also be considered as part of the EIA.
Increase in flood risk from canals	In	Parts 1b, 2, 3 and 4a	There are some mechanisms whereby flood risk from the canals during the operational phase could be increased and which will be considered in the FRA such as: • Additional flow entering the system raising water levels that cause overtopping of banks, this could be exacerbated if the rise in water levels causes bridges to surcharge². • Potential increase in velocities (particularly at bridges and tunnels) in the canals causing structural damage (via scour) and an increase in flood risk (thought to be minor based on results so far). • Rapid drawdown of Drayton and Daventry reservoirs which may lead to flow being transferred back into the GUC too quickly and subsequent impacts on the canal embankments downstream of Braunston Tunnel.

² The GUC Transfer Gate 2: Hydraulic Model Upgrade Report (Ref. 77) presents outcomes of hydraulic modelling to date that has been used to quantify the rise in water levels to inform the bank raising and bridge works. Hydraulic modelling is planned to optimise the water levels in each of the pounds to inform the bank raising and bridge raising design, thus mitigating this increase. This will be referenced in the ES.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			Under sizing of the transfer infrastructure into and out of the Daventry and Drayton Reservoirs could lead to overtopping of the canal embankments.
	Out	Parts 1a and 4b	Potential impacts associated with flood risk are unlikely to occur in Parts 1a and 4b as these parts are not located in proximity to the canal section which will be altered by the Proposed Development.
Increased surface water flooding risk	In	All	There are some mechanisms whereby surface water flood risk during the operational phase could be increased: - New above ground components of the Proposed Development (such as the AWTP, BPT and pumping stations) may cause an increase in runoff elsewhere. - Increase in impermeable areas may cause an increase in surface water runoff. - Above ground components of the Proposed Development may alter surface water flood flow pathways.
Increase in fluvial flood risk	In	All	There are a few mechanisms whereby fluvial flood risk during the operational phase could be increased: - Permanent above ground structures placed in the floodplain could displace floodplain storage or divert flood flow pathways and increase flood risk elsewhere - Rise in water levels in the canal network could increase discharge over the waste weirs (potentially exacerbated if the rise in water levels causes bridges to surcharge), thus increasing the flow into the surrounding watercourses and potentially flood risk. This could occur upstream of the Braunston Tunnel and also downstream of Braunston Tunnel if there is a rapid drawdown of the Daventry and Drayton reservoirs.

Potential Effects	Scoped In / Out	Proposed Development Part(s)	Rationale
			Inadequate design or sizing of the transfer infrastructure into and out of the Daventry and Drayton reservoirs could lead to an increase in discharge in spills over the waste weirs, increasing flows in the receiving watercourses and potentially an increase in flood risk.
Changes to flow patterns and sediment mobility	In	Part 2	There is some potential for local impacts from maintenance requirements, such as dredging for navigation around locks, which needs to be investigated further. These impacts would be highly localised and are unlikely to be significant but nevertheless are scoped in for further assessment.
	Out	Parts 1a, 1b, 3, 4a and 4b	Maintenance works that would cause changes to flow or sediment mobility (such as dredging) would not be required in Parts 1a, 1b, 3, 4a and 4b therefore there is no potential for local impacts.
Deterioration of surface water dependent terrestrial ecosystems (SWDTEs) and protected sites	In	All	There are SWDTEs in the study areas of all parts of the Proposed Development. The impact of any changes in water quality on these will be considered as part of the EIA.

22.7 Approach to Assessment

Establishing Baseline Conditions

- 22.7.1 The EIA and supporting assessments will be informed by desk studies, surveys and intrusive ground investigations, as detailed below.

Additional data collection

- 22.7.2 This EIA Scoping Report has collated data in the general corridors for each Part of the Proposed Development; ongoing investigation work for the RAPID gated process has also collated key hydrological and water quality data and model simulations for Parts 1a, 2 and 3 of the Proposed Development.
- 22.7.3 Once the design is further developed, local and more specific data is likely to be required, particularly to inform the baseline for Parts 1b, 4a and 4b (the pipeline routes), as well as further data collection and model simulation refinement for Parts 1a, 2 and 3. This is likely to include:
- a. Targeted ground investigations and groundwater monitoring for the Proposed Development in the areas of below ground workings (such as the pipeline routes – Part 1b and 4b). This would allow for verification of ground conditions as well as the collection of sufficient data on groundwater levels and quality;
 - b. Primary data collection, including geomorphological characterisation (where required) for the watercourses and waterbodies potentially impacted by the Proposed Development, particularly for pipeline routes (Parts 1b and 4b) and water body crossings; and
 - c. Continuation of hydrological monitoring and water quality monitoring programmes, as well as further model simulations for the rivers Tame and Trent, the GUC and Daventry and Drayton Reservoirs (Parts 1a, 2 and 3).

Supporting studies to assess impacts

- 22.7.4 A detailed WFD compliance assessment will be undertaken in accordance with the WFD Scoping Report appended to this EIA Scoping Report. This will consider WFD waterbodies across all parts of the Proposed Development and determine mitigation to avoid deterioration to water bodies where there is an impact pathway. It will also consider an assessment against future water body target status to demonstrate mitigation required to ensure the Proposed Development does not prevent future WFD target status from being achieved.
- 22.7.5 A scheme-wide FRA will be undertaken to support the EIA and DCO application. To date, an interim FRA has only been undertaken for Part 1a of the Proposed Development to support design feasibility as part of the RAPID gated process. The full FRA for the Proposed Development will address the requirements of the NPSWRI and the NPPF with respect to flood risk. It will cover all relevant sources of risk pre- and post-development (i.e. fluvial, pluvial, groundwater, sewer and artificial sources) for the operational lifetime of the Proposed Development, using hydraulic modelling where required and giving due regard to appropriate climate change allowance(s).

- 22.7.6 Further hydraulic and water quality modelling of the River Tame and River Trent for in-channel flows will be undertaken as part of the RAPID gated process. This includes assessment of climate change scenarios to the 2080s for both flow and water quality and will consider future WFD status compliance in the River Tame. 2D dissolved oxygen modelling is also to be completed for the stretch of the River Tame between Minworth WwRC and Lea Marston lakes. This will inform the full WFD compliance assessment and ES.
- 22.7.7 Further hydraulic and water quality modelling of the canal network (Part 2) is planned to support the EIA and ongoing RAPID gated investigation and will include updated transfer controls to confirm the impact of the Proposed Development on (e.g.) surge, water levels, spills over waste weir and by-weirs. One of the purposes of this hydraulic modelling will be to optimise each pound to obtain optimal water level control which minimises increases in waste weir spills. This will inform the FRA and ES.
- 22.7.8 Following hydraulic modelling of the canal network, and optimisation of the water level controls in the pounds, further hydrological (and potentially) hydraulic modelling may be required if there are locations with additional discharges into surrounding watercourses. This will be to understand the impact on flows (low-flow and flood flows) in the receiving watercourses and associated habitats and potential WFD effects. These studies will be used to inform the assessment of impacts in the ES.
- 22.7.9 Surface water drainage strategies will be prepared which will outline how surface water runoff from key aspects of the Proposed Development will be managed. These will need to be prepared in line with current policy and guidance, and in liaison with the relevant LLFAs. These will inform the FRA and ES.
- 22.7.10 Using historic sediment quality data from the Trust, further work will be undertaken for the next stage of the EIA to investigate effects on canal dredging and maintenance regimes associated with changes to flows under the scheme. This could potentially affect surface water WFD, water quality and flood risk. These studies will feed into the assessment for the ES.
- 22.7.11 Further contamination assessment maybe required for locations along the canal network where there is likely to be an increase in bed mobilisation as a result of the Proposed Development.
- 22.7.12 Additional site-specific groundwater assessments, using the data collected through the targeted ground investigations and groundwater monitoring, may be required should the elements of the Proposed Development and the associated working areas directly traverse a GWDTE or the contributing area to an Environment Agency licenced abstraction. The data received to date suggests that this is not the case and that additional site-specific groundwater assessments are not likely to be required. This will be reviewed on the receipt of more data.

Assessment Methodology

- 22.7.13 The assessment methodology for the EIA will be based on the guidance outlined in the DfT TAG Unit A3 Environmental Impact Appraisal (Ref. 56), whereby key water environment features, constraints and receptors are

identified; the sensitivity, importance and value of each identified feature is assigned based on their quality, scale, rarity and substitutability; the potential impacts of the Proposed Development on each feature are identified and a magnitude of impact assigned; and the sensitivity of each identified feature is combined with the magnitude of potential impact to determine the consequence or significance of the effect.

Assessment Criteria

Sensitivity of Receptors

- 22.7.14 Within the water resources and flood risk topic, there are four types of receptors that will be assessed as part of the EIA. Selection of these receptors is based on the Water Environment Regulations 2017 (WER) requirements (Ref. 3), the National Policy Statement (Ref. 15), NPPF (Ref. 16) and Planning Practice Guidance for flood risk (Ref. 67). Receptors are listed below alongside the characteristics of each receptor type that will be considered in the assessment:
- a. Surface water features (including rivers, canals, lakes, reservoirs, estuarine and coastal waters): The hydrology, geomorphology and water quality of surface waters (e.g. rivers, canals, lakes and reservoirs) and water-dependent habitats, including designated sites (e.g. SAC, SPA, SSSI);
 - b. Groundwater features: The flows, quantity and quality of groundwater resources and groundwater-dependent habitats, including designated sites (e.g. SAC, SPA, SSSI);
 - c. Surface and groundwater resources: Water resources, including abstractions from surface and groundwaters (e.g. Principal, Secondary A and Secondary Undifferentiated aquifers) and associated designated sites (e.g. Source Protection Zones, Drinking Water Protected Areas (DrWPA)) and water supply infrastructure (including Daventry and Drayton Reservoirs, treatment plants, pumping stations and distribution networks) and surface and foul drainage infrastructure; and
 - d. Flood risk receptors, including the Proposed Development: Flood risk to the Proposed Development from all relevant sources, including fluvial, surface water, groundwater, sewer and reservoir flooding, and changes in flood risk to third party property, people and land as a result of the Proposed Development potentially altering flooding pathways or extent of flooding.
- 22.7.15 Whilst other disciplines may consider 'receptor sensitivity', 'receptor importance' is considered here. This is because when considering the water environment, the availability of dilution means that there can be a difference in the sensitivity and importance of a water body. For example, a small drainage ditch of low conservation value and biodiversity with limited other socio-economic attributes, is very sensitive to impacts, whereas an important regional scale watercourse, which may have conservation interest of international and national significance and support a wider range of important socio-economic uses, is less sensitive by virtue of its ability to assimilate discharges and physical effects. Irrespective of importance, all controlled waters in England are protected by law from being polluted.

22.7.16 The importance of each identified receptor will be assigned using criteria outlined in the DfT TAG Unit A3 Environmental Impact Appraisal (Ref. 56), as outlined in **Table 22-30**.

Table 22-30: Evaluating the importance of receptors – Groundwater

Importance	Criteria	Examples
Very high	Feature with a high quality and rarity, regional or national scale and limited potential for substitution.	(Principal) Aquifer providing potable water to a large population (groundwater).
High	Feature with a high quality and rarity, local scale and limited potential for substitution feature with a medium quality and rarity, regional or national scale and limited potential for substitution.	(Secondary) Aquifer providing potable water to a small population (groundwater).
Medium	Feature with a medium quality and rarity, local scale and limited potential for substitution feature with a low quality and rarity, regional or national scale and limited potential for substitution.	(Secondary) Aquifer providing abstraction water for agricultural or industrial use (groundwater).
Low	Feature with a low quality and rarity, local scale and limited potential for substitution.	Unproductive strata (groundwater).

22.7.1 **Table 22-31** presents the criteria for evaluating the importance for surface water and flood risk receptors.

Table 22-31: Evaluating the importance for surface water and flood risk receptors

Importance	General Criteria	Surface Water	Hydromorphology	Flood Risk
Very high	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.	Watercourse having a WFD classification as shown in a RBMP and $Q95 \geq 1.0 \text{ m}^3/\text{s}$; Site protected / designated under international or UK habitat legislation (SAC, SPA, SSSI, Water Protection Zone (WPZ), Ramsar Site. Critical social or economic uses (e.g. public water supply and navigation).	Unmodified, near to or pristine conditions, with well-developed and diverse geomorphic forms and processes characteristic of river and lake type.	Floodplain or defence protecting more than 100 residential properties from flooding; Flood Zone 3a and/or 3b; Essential Infrastructure or highly vulnerable development.
High	Receptor of national or regional importance with a low ability to absorb change without fundamentally altering its present character.	Watercourse having a WFD classification as shown in a RBMP and $Q95 < 1.0 \text{ m}^3/\text{s}$; Major Cyprinid Fishery; Species protected under international or UK habitat legislation. Critical social or economic uses (e.g. water supply and navigation). Important social or economic uses such as water supply, navigation or mineral extraction.	Conforms closely to natural, unaltered state and will often exhibit well-developed and diverse geomorphic forms and processes characteristic of river and lake type. Deviates from natural conditions due to direct and/or indirect channel, floodplain, bank modifications and/or catchment development pressures.	Floodplain or defence protecting more than 10 between 1 and 100 residential properties or industrial premises from flooding; Flood Zone 2; More vulnerable development.
Medium	Receptor of regional or local importance, with medium ability to absorb,	Watercourse detailed in the Digital River Network but not having a WFD	Shows signs of previous alteration and/or minor flow or water level regulation but still	Floodplain or defence protecting 10 or fewer industrial

Importance	General Criteria	Surface Water	Hydromorphology	Flood Risk
	adapt to or recover from change. The receptor is of regional or local importance and has medium capacity to absorb change, adapt to or recover from change without significantly altering its present character.	classification as shown in a RBMP. May be designated as a local wildlife Site (LWS) and support a small / limited population of protected species. Limited social or economic uses.	retains some natural features or may be recovering towards conditions indicative of the higher category.	properties from flooding; Flood Zone 2; Less vulnerable development.
Low	The receptor is of local importance and tolerant of change without detriment to its character (i.e. has some ability to absorb, adapt to or recover from change).	Surface water sewer, agricultural drainage ditch; non-aquifer WFD Class 'Poor' or undesignated in its own right. Low aquatic fauna and flora biodiversity and no protected species. Minimal economic or social uses.	Substantially modified by past land use, previous engineering works or flow/water level regulation. Likely to possess an artificial cross-section will probably be deficient in bedforms and bankside vegetation. May also be realigned or channelised with hard bank protection, or culverted and enclosed. May be significantly impounded or abstracted for water resources use. Could be impacted by navigation, with associated high degree of flow regulation and bank protection, and probable strategic need for maintenance dredging. Artificial water bodies fall into this category.	Floodplain with limited constraints and low probability of flooding of residential and industrial properties; Flood Zone 1; Water compatible development.

Importance	General Criteria	Surface Water	Hydromorphology	Flood Risk
Negligible	Receptor is resistant to change and is of little or no environmental value.	Not applicable.	Not applicable.	Not applicable.
Note 1: Professional judgement is applied when assigning an importance category to all water features. The WFD status of a watercourse is not an overriding factor and, in many instances, it may be appropriate to upgrade a watercourse which is currently at poor or moderate status to a category of higher importance to reflect its overall value in terms of other attributes and WFD targets for the watercourse. Likewise, a watercourse may be below Good Ecological Status, this does not mean that a poorer quality discharge can be emitted. All controlled waters are protected from pollution under the Environmental Permitting (England and Wales) Regulations 2016 (Ref. 4) and the Water Resources Act 1991 (as amended) (Ref. 10), and future WFD targets also need to be considered. Note 2: Based on the water body 'Reach Conservation Status' presently being adopted for a major infrastructure project (and developed originally by Atkins) and developed from EA conservation status guidance (Ref. 84 and Ref. 85) as LA113 (Highways Agency (2019) DMRB, LA113, Road Drainage and the Water Environment) (Ref. 61) does not provide any criteria for morphology.				

Magnitude of Impacts

22.7.2 The magnitude of potential impact will be determined using criteria outlined in the DfT TAG Unit A3 Environmental Impact Appraisal (Ref. 56), as outlined in **Table 22-32**.

Table 22-32: Determining Magnitude of Impact on Water Receptors

Value	Criteria	Examples
Large adverse	Results in loss of feature.	Loss of important fishery Change in WFD classification of river reach Loss of flood storage/increased flood risk Pollution of potable source of abstraction
Moderate adverse	Results in adverse impact on integrity of feature or loss of part of feature.	Loss in productivity of a fishery Contribution of a significant proportion of the effluent in the receiving river, but insufficient to change its WFD classification
Slight adverse	Results in minor adverse impact on feature.	Measurable changes in feature, but of limited size and/or proportion
Negligible	Results in an impact on feature but of insufficient magnitude to affect the use/integrity.	Discharges to watercourse but no significant loss in quality, fishery productivity or biodiversity No significant impact on the economic value of the feature No increase in flood risk
Slight beneficial	Results in minor beneficial impact on feature or a reduced risk of adverse effect occurring.	Measurable changes in feature, but of limited size and/or proportion
Moderate beneficial	Results in moderate improvement of feature.	Enhanced productivity of a fishery Reduction in a significant proportion of the effluent in a receiving river, but not sufficient to change its WFD classification Moderate reduction in flood risk
Large beneficial	Results in major improvement of feature.	Removal of major existing polluting discharge to a watercourse Major reduction in flood risk

Effect Significance

22.7.3 The effect significance will be determined using criteria outlined in the DfT TAG Unit A3 Environmental Impact Appraisal (Ref. 56), as outlined in **Table 22-33**.

Table 22-33: Significance of effect matrix – Water Environment and Flood Risk

Magnitude of Impact	Importance of Feature			
	Very high	High	Medium	Low
Major	Very highly significant	Highly significant	Significant	Low significance
Moderate	Highly significant	Significant	Low significance	Insignificant
Minor	Significant	Low significance	Insignificant	Insignificant
Negligible	Low significance	Insignificant	Insignificant	Insignificant

22.7.4 In general, 'major' and 'moderate' effects are considered 'significant', whilst 'minor' and 'negligible' effects are considered 'not significant'. Professional judgement will be applied in reaching conclusions as to the significance of effects.

22.8 Assumptions, Limitations, and Uncertainties

22.8.1 The following assumptions, limitations and uncertainties are known:

- a. The baseline conditions will be determined from both desk-based and field studies, which may have specific assumptions, limitations and uncertainties that will be discussed in the EIA;
- b. It may be necessary to make reasonable and informed assumptions based on published data. This will be identified, where required, within the ES;
- c. The assessments will include the information reasonably required to assess likely significant environmental effects and will represent a 'reasonable worst-case', based on conservative inputs derived from available field or desk study data and published research literature relevant to the study area. While uncertainty is inherent to the assessment of interaction between surface water and groundwater, the collected data will enhance the understanding of these interactions;
- d. Given the limited interaction of the Proposed Development with the underlying aquifers, the use of a full scale 3D numerical model to accurately represent the hydrogeological regime and how it may be affected by the Proposed Development is not considered to be required. Where required, analytical and conceptual models will be developed for key assessment areas to ascertain the impacts of the Proposed Development on the groundwater environment; and
- e. Intrusive ground investigations field works are likely to be undertaken across the majority of the EIA Scoping Boundary to determine the site-specific ground conditions. Conceptual models applied within the assessment will be derived with the available baseline groundwater level monitoring information obtained from the completed exploratory holes and groundwater monitoring.

22.9 Approach to Mitigation

22.9.1 Mitigation is envisaged to comprise a combination of the following recognised standard approaches as appropriate:

- a. Embedded mitigation inherent of the design of the Proposed Development, comprising design measures such as location of infrastructure and the use of construction methodologies to minimise significant effects, such as trenchless pipe jacking techniques to cross sensitive surface waterbodies and reducing working area widths;
- b. Additional mitigation developed in response to identified effects, potentially including site-specific measures to protect water quality and prevent changes to flood risk. Expected measures include water quality monitoring, raising the waste weirs to avoid additional spilling, raising bridges to avoid surcharge, using Daventry and Drayton reservoirs to act as a storage option to augment the transfer in the GUC during periods of high demand, or as dictated by the 'hands-off-flows' in the River Trent, and using the pumping stations operating philosophy along the canals to prevent surges occurring in pounds or increases in water levels; and
- c. Standard measures, including measures to reduce reasonably anticipated construction effects, such as recognised good construction site management practices, silt runoff control and spill kits carried with all mobile plant machinery.

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Chapter 23: Structure of Environmental Statement

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23. Structure of Environmental Statement

23.1 Context

- 23.1.1 This chapter describes the likely structure of the Environmental Statement (ES) based on the scoping in and out of aspects and matters presented in this EIA Scoping Report and in accordance with guidance for the content of scoping requests contained in the Planning Inspectorate's (PINS) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (2020) (Ref. 1). This will be reviewed again on the receipt of the EIA Scoping Opinion. It also sets out the proposed next steps as the Proposed Development moves forward after the EIA Scoping stage.
- 23.1.2 The ES will be prepared in accordance with the requirements for an ES as set out in Regulation 14 and Schedule 4 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations') (Ref. 2).

23.2 Topics Scoped in and out of the ES

- 23.2.1 On the basis of the scoping analysis presented in **Chapters 8-22** (as summarised in **Chapter 24: Summary**) of this EIA Scoping Report, it is concluded that none of the topics considered can be completely scoped out of the EIA. Therefore, it is proposed that the ES will include a discrete technical assessment chapter for each of the topics considered within this EIA Scoping Report.

23.3 Proposed ES Structure

- 23.3.1 The ES will be produced in a number of volumes. These will include the following:
- a. **Non-Technical Summary (NTS)** – this document will summarise the main elements of the Proposed Development and the likely significant environmental effects identified through the EIA process as outlined within Part 5 (14 (2) (e)) of the EIA Regulations (Ref. 2). The NTS will be designed to provide information on the Proposed Development in an accessible format which can be understood by a wide audience and to assist interested parties with their familiarisation of the Proposed Development;
 - b. **ES Volume I: Main Document** – this document will comprise the main body of the ES, detailing the results of the environmental assessments (including cumulative effects), the likely significant effects arising from the Proposed Development and any proposed mitigation measures to avoid, reduce or minimise any identified likely significant adverse environmental effects. It is anticipated that the contents of this Volume would be the following:
 - i. Chapter 1: Introduction;
 - ii. Chapter 2: Existing Site and Surroundings;

- iii. Chapter 3: The Proposed Development;
 - iv. Chapter 4: Alternatives and Design Evolution;
 - v. Chapter 5: Consultation and Engagement;
 - vi. Chapter 6: Environmental Impact Assessment Methodology;
 - vii. Chapter 7: Agriculture and Soils;
 - viii. Chapter 8: Air Quality and Odour;
 - ix. Chapter 9: Carbon;
 - x. Chapter 10: Climate
 - xi. Chapter 11: Cultural Heritage;
 - xii. Chapter 12: Ecology – Aquatic;
 - xiii. Chapter 13: Ecology – Terrestrial;
 - xiv. Chapter 14: Ground Conditions;
 - xv. Chapter 15: Human Health;
 - xvi. Chapter 16: Landscape and Visual;
 - xvii. Chapter 17: Major Accidents and Disasters;
 - xviii. Chapter 18: Materials and Waste;
 - xix. Chapter 19: Noise and Vibration;
 - xx. Chapter 20: Socio-economics;
 - xxi. Chapter 21: Traffic and Transport;
 - xxii. Chapter 22: Water Environment and Flood Risk;
 - xxiii. Chapter 23: Cumulative Effects and Interactions; and
 - xxiv. Chapter 24: Summary of Effects.
- c. **ES Volume II: Supporting Figures** – this document will comprise the supporting figures to the topic chapters in Volume I; and
- d. **ES Volume III: Technical Appendices** – this document will comprise the supporting technical appendices to the topic chapters in Volume I, comprising of (e.g.) background data and supporting technical and surveys reports. At this stage, it is anticipated that the following technical appendices will be prepared (if required), although this is subject to change:
- i. Agricultural Land Classification (ALC) and soil survey report;
 - ii. Arboricultural Impact Assessment;
 - iii. Cultural Heritage Desk-Based Assessment reports;
 - iv. Draft protected species license applications;

- v. Drainage Strategy and plans;
- vi. Ecology survey reports;
- vii. Flood Risk Assessment (FRA);
- viii. Geophysical survey reports;
- ix. Ground Investigations works and interpretative reports;
- x. Noise survey reports;
- xi. Phase 1 Ground Conditions reports;
- xii. Traffic survey reports;
- xiii. Transport Statement;
- xiv. Views photography and visualisations; and
- xv. Water Framework Directive (WFD) Assessment.

Preliminary Environmental Information Report

- 23.3.2 The Preliminary Environmental Information Report (PEIR) sets out the information that “...*is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)*” (Regulation 12(2)(b) of the EIA Regulations [Ref. 2]).
- 23.3.3 The PEIR will be made available before the ES to inform statutory consultation (which will be conducted in accordance with the Planning Act 2008 [Ref. 3]) on the EIA before the ES is submitted with the DCO application. The ES will be based on and update any information presented within the PEIR. Therefore, following recent DCO guidance (Ref. 4), the PEIR will be prepared “...*as an early draft of the Environmental Statement*” in order for ease of disseminating and understanding the updated information provided in the ES.

23.4 Application Documents

- 23.4.1 In addition to the ES, at this stage it is anticipated that the DCO application may be accompanied by, but not limited to, the following documents (some of which may be appended to the ES):
- a. Code of Construction Practice (including Dust Management Plan [DMP] and Outline Site Waste Management Plan [SWMP]);
 - b. Outline Construction Environmental Management Plan (CEMP);
 - c. Outline Construction Traffic Management Plan (CTMP);
 - d. Outline Public Rights of Way (PRoW) Management Plan;
 - e. Outline Landscape and Ecology Management Plan (LEMP);
 - f. Outline Soil Management Plan (SMP);
 - g. Equalities Impact Assessment (EqIA);
 - h. Outline Skills Supply Chain and Employment Plan;

- i. Biodiversity Net Gain (BNG) Report;
- j. Environmental Net Gain (ENG) Report;
- k. Habitat Regulations Assessment (HRA) Screening Report;
- l. Social Value Strategy (if required); and
- m. Mitigation/Commitments Register.

23.4.2 The final set of documents to be submitted with the DCO application will be agreed with PINS and Local Planning Authorities, as appropriate.

23.5 References

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24. Summary

- 24.1.1 This EIA Scoping Report represents a formal application to the Secretary of State (SoS) for Environment, Food and Rural Affairs under Regulation 10(1) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') (Ref. 1) for a 'Scoping Opinion' as to the information to be provided within the Environmental Statement (ES) that will form part of the Development Consent Order (DCO) application.
- 24.1.2 This EIA Scoping Report has identified the potentially likely significant environmental effects of the Proposed Development and proposes the approach to be used in assessments that will be undertaken as part of the forthcoming EIA.
- 24.1.3 In accordance with Regulation 10 of the EIA Regulations, the consultation bodies prescribed by sub-sections 42(1)(a) and 42(1)(b) of the Planning Act 2008 (Ref. 2) and listed in Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (Ref. 3) must be invited to consider and provide comment on the contents of this EIA Scoping Report. In accordance with Regulation 10(6) of the EIA Regulations, the SoS has a duty to adopt a Scoping Opinion within the statutory 42-day time period.
- 24.1.4 This chapter presents a summary of which potential effects from the construction and operational phases¹ of the Proposed Development are to be scoped in or out of the EIA and the rationale behind this decision (as presented in **Chapters 8-22** of this EIA Scoping Report).
- 24.1.5 **Table 24-1 to Table 24-15** (split by topic) summarise the potential effects of the Proposed Development and identifies whether, for each Part of the Proposed Development (as defined in **Chapter 3: Description of the Proposed Development** of this EIA Scoping Report), those potential effects are to be scoped in or out of the EIA, providing a justification in each case. For full details of each technical scope, refer to **Chapters 8-22**.
- 24.1.6 Within the tables, there is a distinction made between 'scoped out' and 'not applicable' ('n/a'):
- 'Scoped out' refers to likely effects that are not considered significant and therefore do not require further assessment in the EIA. This is further explained in the rationale/justification part of the table; and
 - 'n/a' refers to where there is no prospect of an effect from a particular Proposed Development Part(s), either due to the particular nature or location of the Proposed Development Part and/or the absence of a receptor within the study area for that particular Proposed Development Part. For example, the potential effect 'Algal blooms in Daventry and

¹ As per **Chapter 6: EIA Approach**, the EIA Scoping Report seeks to scope out decommissioning effects on the basis that the Proposed Development will be operated indefinitely.

Drayton reservoirs' is only relevant to Part 3 of the Proposed Development.

- 24.1.7 This chapter is supported by **Appendix 24-1: Commitments Register** included within Volume 3 of this EIA Scoping Report. The Commitments Register has been prepared in accordance with Planning Inspectorate's guidance (Ref. 4) and summarises the potential mitigation measures identified across **Chapters 8-22** of this EIA Scoping Report, including where the Applicants have relied on commitments as the basis for scoping matters out or refining the scope of assessment. The Commitments Register will be maintained as a 'live' document that is updated throughout the planning process and will ensure that all commitments are up to date at the time the DCO application is decided by the SoS.

Table 24-1: Summary of the scoping of potential effects – Agriculture and Soils

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 8: Agriculture and Soils	Construction								
	Loss and disturbance of soil resources related to agricultural land may occur <i>in situ</i> , for example through trafficking by vehicles or through soil removal, handling, storage and subsequent reinstatement, which may result in the impairment of soil function, quality or resilience	Out	In	Out	Out	In	In	Part 4a would result in the permanent loss of soil function for agriculture, with the significance determined by Agricultural Land Classification (ALC) grade, soil type and Institute of Environmental Management and Assessment (IEMA) guidelines (Ref. 5). Parts 1b and 4b would cause temporary soil and agricultural land disturbance during construction from: • Stripping and stockpiling of topsoil and subsoil, storage and reinstatement; • Ground excavation; • Trenchless drilling (e.g. Horizontal Directional Drilling [HDD]); • Stockpiling materials; and • Vehicle movements onsite.	No agricultural land is required for Parts 1a, 2 and 3 of the Proposed Development. Geo-environmental considerations relating to non-agricultural soils are provided within Chapter 14: Ground Conditions .
	Impacts on agricultural land through restriction to agricultural function within the farm holding	n/a	Out	n/a	n/a	Out	Out	n/a	The restriction to agricultural function from permanent and temporary use of farmland (Parts 1b, 4a and 4b) is a potential socio-economic impact and is addressed in Chapter 19: Socio-economics . No agricultural land is required for Parts 1a, 2 and 3 of the Proposed Development. Geo-environmental considerations relating to non-agricultural soils are provided within Chapter 14: Ground Conditions .
	Operation								
	Loss and disturbance of soil resources related to agricultural land may occur <i>in situ</i> , for example through trafficking by vehicles or through soil removal, handling, storage and subsequent reinstatement, which may result in the impairment of soil	Out	Out	Out	Out	Out	Out	n/a	There will be no disturbance of soils and agricultural land once the Proposed Development is complete and operational. Any maintenance or repair works would be ad hoc and limited and managed in accordance with standard industry practice. Geo-environmental considerations relating to non-agricultural soils are provided within Chapter 14: Ground Conditions .

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	function, quality or resilience								
	Impacts on agricultural land through restriction to agricultural function within the farm holding	n/a	Out	n/a	n/a	Out	Out	n/a	The restriction to agricultural function from permanent and temporary use of farmland (Parts 1b, 4a and 4b) is a potential socio-economic impact and is captured in Chapter 19: Socio-economics. No agricultural land is required for Parts 1a, 2 and 3 of the Proposed Development. Geo-environmental considerations relating to non-agricultural soils (Parts 1a, 2 and 3) are provided within Chapter 14: Ground Conditions.

Table 24-2: Summary of the scoping of potential effects – Air Quality and Odour

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 9: Air Quality and Odour	Construction								
	Construction dust and impacts, including the use of Non-Road Mobile Machinery (NRMM)	Out	In	In	In	Out	In	Potential impacts from dust emissions during the construction phase of the Proposed Development have been considered using the Institute of Air Quality Management (IAQM) Guidance (Ref. 6). Construction activities for Parts 2 and 3 are anticipated to include pipeline cut and fill and small-scale drilling, construction of pumping stations, bypass weirs, bank raising, and other works to the canal network. Given the sensitivity of the canal network and users, this has been scoped in on a precautionary basis. Construction of the two pipelines (Parts 1b and 4b) would be undertaken in a phased manner for each Part with work activity progressing sequentially from one location to the next. The duration of works at any one location would be considered short-term. Construction activities for Parts 1b and 4b are anticipated to include pipeline cut and fill and small-scale boring delivered using small crews that move from work site to work site along the pipeline corridor. Construction dust emissions will be controlled using good practice techniques and mitigation	Potential dust emissions during the construction of Parts 1a and 4a of the Proposed Development have been assessed using IAQM Guidance (2024) (Ref. 6). Construction activities will include earthworks, pipeline cut and fill, concrete batching plant, steel frame erection, and canal network works, with low to moderate dust generation potential. Dust emissions will be managed through good practice measures and a Dust Management Plan, which will be secured within the CoCP. The CoCP will be submitted as part of the DCO application to ensure compliance with best practice mitigation. With these mitigation measures in place, no significant air quality or amenity impacts from dust generation are anticipated.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								measures will be identified and secured through a Dust Management Plan as part of the Code of Construction Practice (CoCP). However, due to the location of sensitive ecological receptors immediately adjacent to the EIA Scoping Boundary (e.g. Dunton Coppice Ancient Woodland, Holly Thicks Ancient Woodland and Gallops Hill Wood Ancient Woodland), a construction dust risk assessment has been scoped into the EIA.	
	Construction odour impacts, including the use of NRMM	Out	Out	Out	Out	Out	Out	n/a	No significant odour impacts are expected to arise during construction with any potential odours arising only during operation. However, any potential issues would be managed through an Odour Management Plan within the CoCP, if required.
	Construction traffic emissions (outside an Air Quality Management area [AQMA])	n/a	Out	Out	Out	n/a	n/a	n/a	The majority of the Proposed Development will take place in areas outside AQMAs. However, Parts 1a, 4a and 4b are located within an AQMA(s) and are therefore not included in this particular assessment. The potential impacts from traffic emissions arising from activities during the construction phase for Parts 1b, 2 [partially] and 3 (i.e. those outside AQMAs) have been considered using an approach based on the IAQM Guidance (2017) (Ref. 7). The IAQM Guidance sets out the criteria to establish the need for an air quality assessment based on a 2-way (Annual Average Daily Traffic [AADT] flows that exceed 500 Light Duty Vehicles [LDV] or exceed 100 Heavy Duty Vehicles [HDV]). On the basis of professional judgement, it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria.
	Construction traffic emissions (within or adjacent to an AQMA)	Out	n/a	Out	n/a	Out	Out	n/a	Construction works within or adjacent to AQMAs declared by the Birmingham City Council, Rugby Borough Council, Coventry City Council and Central Bedfordshire occur as part of Parts 1a and 2 [partially] of the Proposed Development. Construction works within or adjacent to AQMAs declared by Central Bedfordshire and Luton Borough Council occur as part of Parts 4a and 4b of the Proposed Development.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
									The potential impacts from traffic emissions arising from activities during the construction phase have been considered using an approach based on the IAQM Guidance (2017) for areas within or adjacent to an AQMA (Ref. 7). The IAQM Guidance sets out the criteria (AADT more than 100 LDVs or more than 25 HDVs) to establish the need for an air quality assessment for the construction phase of a development. On the basis of professional judgement, it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria.
	Operation								
	Operational emissions, including use of NRMM	Out	Out	Out	Out	Out	Out	n/a	The operation of the Proposed Development from the Minworth Advanced Water Treatment Plant (AWTP) (Part 1a), pumping stations (Parts 2, 3, and 4a), and final water transfer (Part 4b) will generate emissions to air at comparable rates to the current baseline scenario. Any potential emissions from these facilities would likely be below local baseline levels and not perceptible.
	Operational odour	Out	Out	Out	Out	Out	Out	n/a	The Proposed Development does not have the potential to change the baseline odour climate at any relevant receptor location (in Parts 1a, 1b, 2, 3, 4a, or 4b) as it cannot give rise to a new odorous emission that are not already present in the baseline and the magnitude and frequency of emissions from canal maintenance activity would be unchanged from the baseline conditions.
	Operational road traffic emissions	Out	Out	Out	Out	Out	Out	n/a	The Proposed Development's operation will involve limited operational vehicles, primarily for Minworth AWTP (Part 1a), the abstraction and treatment site (Part 4a), and occasional maintenance visits to the pipelines (Parts 1b and 4b) and canal network (Parts 2 and 3). Operational traffic is expected to remain below IAQM screening criteria. On the basis of professional judgement, it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria.

Table 24-3: Summary of the scoping of potential effects – Climate

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 10: Climate	Greenhouse Gas (GHG) Impact Assessment								
	GHG emissions	In	In	In	In	In	In	The Proposed Development will generate GHG emissions over its lifecycle, as such a GHG impact assessment has been scoped into the EIA. The following lifecycle stages for civil engineering works set out within the PAS2080:2023 Guidance (Ref. 8) have been scoped into the assessment: • Pre-construction; • Product stage; • Construction process stage; and • Operation stage.	Decommissioning has been scoped out in line with Section 3.8 of Chapter 3: Description of Proposed Development .
	Climate Change Resilience								
	Climate change resilience of the Proposed Development	In	In	In	In	In	In	The Proposed Development may be vulnerable to risks posed by climate change, and as such further assessment will be included within the EIA. The following climate parameters have been scoped into the assessment: extreme weather events, temperature, precipitation, wildfires and wind.	Sea-level rise has been scoped out as the Proposed Development is located inland.
	In-Combination Climate Impacts (ICCI)								
	In-combination impacts of climate change and the Proposed Development on affected receptors	In	In	In	In	In	In	The ICCI assessment will consider how the resilience of various receptors in the surrounding environment (such as local waterways or local heritage assets) are affected by the Proposed Development in combination with future climatic conditions. The following climate parameters have been scoped into the assessment: extreme weather events, temperature, precipitation, wildfires and wind.	Sea-level rise has been scoped out as the Proposed Development is located inland.

Table 24-4: Summary of the scoping of potential effects – Cultural Heritage

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 11: Cultural Heritage	Construction								
	Intrusive construction activities on designated and non-designated heritage	In	In	In	In	In	In	The Proposed Development has the potential to result in a permanent physical impact on heritage assets within the EIA Scoping Boundary through their truncation, removal, or alteration.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	assets (including archaeology)								
	Intrusive construction activities on findspots recorded by the HER	Out	Out	Out	Out	Out	Out	n/a	Intrusive construction activities on findspots recorded by the Historic Environment Record are however scoped out. Findspots can indicate potential for associated archaeological remains, however, because they are no longer in-situ, they are not considered extant assets and as such are scoped out of assessment.
	Presence of construction facilities within the landscape impacting upon the setting of designated and non-designated heritage assets (including archaeology)	In	In	In	In	In	In	The Proposed Development has the potential to result in temporary impacts to heritage assets within the EIA Scoping Boundary and study areas due to changes in their setting during construction.	n/a
	Machinery, noise, dust, vibration and light impacting upon the setting of designated and non-designated built heritage assets	In	In	In	In	In	In	The Proposed Development has the potential to result in temporary impacts to heritage assets during construction within the EIA Scoping Boundary and study areas due to changes in their setting.	n/a
	Operation								
	Presence of the Proposed Development in the landscape having a long-term and/or permanent setting impact upon designated and non-designated heritage assets (including archaeology), as well as the historic landscape character	In	In	In	In	In	In	The Proposed Development has the potential to result in significant effects on designated and non-designated heritage assets and historic landscapes within the EIA Scoping Boundary and study areas due to changes in their setting. Maintenance and operational activities (including machinery, noise, vibration and dust) could also impact the setting of these heritage assets.	n/a
	Physical impacts on designated and non-designated heritage assets (including archaeology)	Out	Out	Out	Out	Out	Out	n/a	It is not anticipated that the operational phase (including maintenance) of the Proposed Development will require any intrusive works outside of those areas that have been disturbed during the construction period. Consequently, this phase does not have the potential to physically impact the cultural heritage resource and it is proposed to scope out direct and

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
									indirect physical effects to designated and non-designated heritage assets (including buried archaeological remains) within the EIA Scoping Boundary during operation.

Table 24-5: Summary of the scoping of potential effects – Ecology - Aquatic

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 12: Ecology – Aquatic	Construction								
	<i>European Statutory Designated Sites</i>								
	Ensor’s Pool SAC/SSSI European Habitats Sites potentially within the Zone of Influence (Zol) of the Proposed Development	n/a	n/a	Out	n/a	n/a	n/a	n/a	No hydrological impact pathway (and thus potential effect) during construction for any European Habitats sites of interest to aquatic ecology – Ensor’s Pool is located as a SAC 1.06 km south-west of the Coventry Canal (Part 2 of the Proposed development) and there are no potential effects during construction due to the intervening urban environment.
	Upper Nene Valley Gravel Pits Special Protection Area (SPA), Ramsar Effects to water quality (deterioration) and hydrological pathways (e.g. reduced flows) during construction due to connectivity of Nene catchment to the GUC Spread of Invasive Non-Native Species (INNS) during construction	n/a	n/a	In	In	n/a	n/a	Potential impact pathway (and thus potential effect) during construction works to the canal network (Part 2) and Drayton and Daventry Reservoirs (Part 3), which are upstream in the headwaters of the River Nene catchment.	n/a
	Humber Estuary SAC / Ramsar / SSSI River Mease SAC / SSSI	Out (incl. Tame and Trent)	Out	n/a	n/a	n/a	n/a	n/a	European Habitats Sites hydrologically connected and within the Zol of the Proposed Development. No impact pathway (and thus potential effect) during construction for any European Habitats sites of interest to aquatic ecology and therefore no impact.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
									These Habitats sites are sufficiently distant to avoid effects to water quality and hydrology during construction.
<i>National Statutory Designated Sites</i>									
	Whitacre Heath SSSI Kingsbury Meadow Local Nature Reserve (LNR) Bentley Park Wood SSSI Blue Lagoon LNR Daventry Country Park LNR Ensor's Pool LNR Newbold Quarry LNR Swift Valley LNR Wavendon Heath Ponds SSSI Direct impacts to qualifying features of designated sites during construction: Deteriorations in water quality Reduced flows in the River Tame Changes in hydrological connectivity to canals (e.g. reduced overflows) Direct impacts to habitats and species within or connected to designated sites during construction Spread of INNS during construction	n/a	In	In	In	n/a	In	Potential impact pathways (and thus potential effects) to the following national statutory designated sites: - Whitacre Heath SSSI (Part 1b, adjacent to EIA Scoping Boundary). - Kingsbury Meadow LNR (Part 1b, 1.21 km north-west). - Bentley Park Wood SSSI (Part 1b, 0.02 km south). - Blue Lagoon LNR (Part 2, 1.74 km west). - Daventry Country Park LNR (within Part 3; 703 m south of GUC). - Ensor's Pool LNR (Part 2, LNR: 961 m south-west; of Coventry Canal). - Newbold Quarry LNR (Part 2, 226 m East of Oxford Canal). - Swift Valley LNR (Part 2, 1.20 km east of Oxford Canal). - Wavendon Heath Ponds SSSI (Part 4b, 1.92 km north-east). Direct impacts to qualifying features of designated sites during construction, e.g. habitat loss or disturbance/mortality of designated features; potential impacts to water quality and hydrological pathways during construction.	n/a
	Other national statutory designated sites (SSSI, LNR) designated at least in part for aquatic ecology interest.	Out (incl. Tame and Trent)	n/a	n/a	n/a	n/a	n/a	n/a	The closest statutory designated sites of interest to aquatic ecology are the River Blythe SSSI (Part 1a, 2.8 km south-east) and Plantsbrook Reservoirs LNR (Part 1a, 2.4 km west). There is no impact pathway (and thus potential effect) during construction for these or any other

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
									statutory designated sites of interest to aquatic ecology, due to lack of direct hydrological connectivity
<i>Non-statutory Designated Sites</i>									
	Daventry Reservoir Local Wildlife Site (LWS), and Drayton Reservoir potential Local Wildlife Site (pLWS) Direct impacts to qualifying features of designated sites during construction: Deteriorations in water quality Direct impacts to habitats and species within or connected to designated sites during construction Spread of INNS during construction	n/a	n/a	n/a	In	n/a	n/a	Construction works to both reservoirs to facilitate transfer of water from the GUC to the reservoirs, requiring land-take for new pipelines and outfall structures, and potential disturbance and pollution during construction. Potential upgrade to spillway and outflow structures (existing downstream connections to the GUC). Direct impacts to qualifying features of designated sites during construction, e.g. habitat loss or disturbance/mortality of designated features.	n/a
	River Tame LWS Potential impacts of pollution (water quality) and hydrological effects (e.g. reduction in flow) during construction Spread of INNS during construction	In (incl. Tame and Trent)	n/a	n/a	n/a	n/a	n/a	The River Tame LWS is approximately 189 m south-east from the Minworth AWTP EIA Scoping Boundary, and hydrologically connected to the Minworth Wastewater Recycling Centre (WwRC) via the final effluent channel and existing WwRC discharges. All other non-statutory designated sites along the Rivers Tame and Trent are scoped out for potential impacts during construction as there is no impact pathway (and thus potential effect).	n/a
	Part 1b, up to 42 sites within the study area Parts 4a and 4b: 33 Country Wildlife Site (CWS) or equivalent within the study area Potential impacts of pollution (water quality) and hydrological effects during construction	n/a	In	n/a	n/a	In	In	Up to 42 non-statutory designated sites of interest to aquatic ecology within the ZOI for Part 1b, and 33 CWSs (or equivalent) for Part 4. Potential impacts through hydrological connectivity during construction, the potential spread of INNS, and disturbance from construction activity (e.g. alteration of bank structure/marginal vegetation through bank raising).	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Direct impacts to habitats and species within or connected to designated sites during construction Spread of INNS during construction								
	Coventry Canal potential LWS (pLWS) Coventry Canal LWS Oxford Canal pLWS Oxford Canal (North) LWS and pLWS Daventry Reservoir & Country Park LWS Drayton Reservoir pLWS Grand Union Canal LWS Grand Union Canal – Northampton Arm LWS Grand Union Canal – Navigation Inn LWS Grand Union Canal, Stanton Low LWS Ouzel Valley CWS – floodplain hydrologically connected to GUC River Ouzel CWS – overlaps the GUC at Leighton Buzzard Direct impacts to qualifying features of designated sites: Deteriorations in water quality Changes in hydrological connectivity to canals (e.g. reduced overflows) Direct impacts to habitats and species	n/a	n/a	In	n/a	n/a	n/a	Potential impacts of pollution (water quality) and hydrological effects during construction. Alteration of bank structure/marginal vegetation through bank raising during construction. Twelve non-statutory designated sites with aquatic ecology interest were identified within the study area. Further non-statutory designated sites of interest to aquatic ecology and hydrologically connected to the canals may be identified through on-going baseline assessment.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	within or connected to designated sites during construction Spread of INNS during construction								
	<i>Habitats</i>								
	Rivers and streams: potential to qualify as Rivers Habitats of Principal Importance (HPI) (includes Main Rivers, ordinary watercourses, and ditches), including the River Ouzel chalk stream Habitat loss or gain as a result of construction Potential impacts of pollution (water quality) and hydrological effects (reduction or increase in flow; hydrological regime) during construction Fragmentation of populations of aquatic species or habitats, including migratory species Potential spread of INNS during construction	In	In	In	In	In	In	The Rivers Tame and Trent receive recycled water from Minworth WwRC and are hydrologically connected to the site. Multiple tributaries are connected to the Tame and Trent. Watercourse crossings (trenchless or open-cut) on the pipeline corridors, as well as potential direct impacts during construction (water quality; hydrological effects). Indirect impacts due to the Proposed Development dividing a habitat, group of related habitats, sites or ecological network, or the creation of partial or complete barriers to the movement of species, with a consequent impairment of ecological function (e.g. temporary impacts at watercourse crossings; fragmentation of watercourse riparian habitats during construction leading to disconnection of aquatic populations). The importance of these habitats in supporting aquatic species, their sensitivity to changes in water quality, and as migratory routes for fish, will be established to inform the impact assessment.	n/a
	Canals (Coventry Canal, Oxford Canal, Grand Union Canal): Direct impacts to canals during construction. Habitat loss or gain. Potential impacts of pollution (water quality) and hydrological effects during construction.	n/a	n/a	In	n/a	n/a	n/a	Construction works to canals, including bank raising, alteration to bank structure (permanent or temporary), removal of bank vegetation (permanent or temporary), alteration of connectivity to receiving water bodies, e.g. via waste weirs, impacts to water quality due to pollution and siltation during construction. Potential impacts or enhancements to the canals through construction activities. Alteration to the functioning of the canals as ecological corridors during construction; fragmentation of canal riparian habitats during	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Alteration of bank structure/marginal vegetation through bank raising during construction. INNS introduction to the canal network due to construction activity.							construction leading to disconnection of aquatic populations. Canals may be recognised as priority habitats in Local Biodiversity Action Plans (LBAP), which will be established by on-going baseline assessment.	
	Standing water (reservoirs and ponds): Direct impacts to standing water during construction. Habitat loss or gain. Potential impacts of pollution (water quality) and hydrological effects during construction. Alteration of bank structure/marginal vegetation during construction. INNS introduction to standing water bodies due to construction activity.	In	In	In	In	In	In	Construction works to reservoirs (Part 3 only), including alteration to bank structure (permanent or temporary), removal of bank vegetation (permanent or temporary). Potential impacts or enhancements to standing water bodies through construction activities. Fragmentation of standing water habitats during construction leading to disconnection of aquatic populations. All Parts of the Proposed Development will assess where relevant ponds and areas of standing water (e.g. adjacent to the canals, and within the Part 1a EIA Scoping Boundary).	n/a
	<i>Species</i>								
	Aquatic species (macroinvertebrates, macrophytes, fish): Species mortality caused by construction activities. Potential impacts of pollution (water quality) and hydrological effects during construction. Reduced discharge from Minworth WwRC. Potential transfer or introduction of INNS during construction.	In	In	In	In	In	In	Direct impacts on species populations (macroinvertebrates, macrophytes, and fish) associated with mortalities due to construction activities, e.g. site clearance, bank raising, watercourse crossings, impacts to water quality. Diverse aquatic macroinvertebrate and macrophyte assemblage in rivers, canals, and standing water bodies has been identified through surveys. Alteration to hydrological regime in the Rivers Tame and Trent, canals, or other watercourses, and corresponding effects on macroinvertebrates. Alteration to hydrological regime in the Rivers Tame and Trent and corresponding effects on macrophytes.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Fish species assemblage: Species mortality caused by construction activities Potential impacts of pollution (water quality) and hydrological effects during construction Susceptibility of fish to algal blooms Changes in sediment composition Potential spread of diseases during construction	In	In	In	In	In	In	All aquatic habitats (watercourses, canals, standing water) support fish species. Potential for direct or indirect mortality of fish during construction. Alterations to flow regime and potential water quality impacts during construction. Potential impacts to fish passage (including migratory species) and habitat connectivity.	n/a
	Fish: Disturbance, e.g. noise and vibration, lighting, disturbance to fish species, including through horizontal directional drilling (HDD) crossing of Main Rivers	In	In	In	In	In	In	Indirect impacts resulting from a change in normal conditions (i.e. light, noise, vibration, human activity) that result in individuals or populations of species changing behaviour or range. Includes the effects of noise and vibration, and lighting during construction, notably the effects on migratory and spawning fish due to piling, plant movement, machinery, lighting.	n/a
	Fish – European Eel: Entrainment and/or entrapment during construction	n/a	n/a	In	n/a	n/a	n/a	Potential for European eel to become entrained or trapped during construction, which may constitute an offence under The Eels (England and Wales) Regulations 2009 (Ref. 9) (the 'Eel Regulations').	n/a
	Fish species – smelt: Detrimental effects to fish passage and spawning habitats	Out (incl. Tame and Trent)	n/a	n/a	n/a	n/a	n/a	n/a	Smelt were scoped out at Gate 1 given that Environment Agency records of this species are for the Humber Estuary and not the Rivers Tame and Trent, and no significant hydrological effects are modelled downstream of the tidal limit (Cromwell Weir).
	Aquatic macrophytes: Marginal canal vegetation	n/a	n/a	In	n/a	n/a	n/a	Bank raising will result in the temporary removal of marginal vegetation during construction, disturbance to marginal habitats, and time taken for reinstatement and development. Like for like habitat replacement is proposed but opportunities for habitat improvement will be considered as part of the	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								EIA and Biodiversity Net Gain (BNG) assessment.	
	White-clawed crayfish: No impact pathway, therefore, no potential effects	Out	Out	Out	Out	Out	Out	n/a	Through desk study and eDNA surveys, it has been established that white-clawed crayfish are absent from all parts of the Proposed Development.
	Algal bloom in Daventry and Drayton reservoirs	n/a	n/a	n/a	In	n/a	n/a	The Trust report there have been historical algal bloom issues at both Drayton and Daventry Reservoirs. Blue-green algae was reported to be present at Drayton Reservoir by the Canal and River Trust in October 2014 (Ref. 10) and October 2016 (Ref. 11). Blue-green algal blooms were reported at Daventry Reservoir, most notably in September 2010 and October 2010. Potential increased risk of algal bloom during construction, e.g. due to water quality impacts.	n/a
INNS									
	INNS (macroinvertebrates, macrophytes, and fish INNS) Spread and/or establishment of INNS during construction through e.g. excavation, plant movement, introduction of INNS from off-site	In	In	In	In	In	In	Construction methods resulting in spread of INNS, e.g. downstream or off-site, during the crossing of watercourses. The potential for increased turbidity may favour survival and spread of zander, and other species which hunt effectively in low-light conditions and are suited to survival in turbid water. Changes in water quality during construction facilitates INNS spread or establishment. Risk of INNS spreading during construction from, e.g. excavation, plant movement, introduction of INNS from off-site.	n/a
Operation									
<i>European Statutory Designated Sites</i>									
	Humber Estuary SAC / Ramsar / SSSI. Potential impacts on fish passage in the Tame and Trent due to reduced flows in the rivers resulting from reduced discharge from Minworth WwRC Reduced flows and altered hydrological	In (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	Reduction in effluent discharge from Minworth WwRC results in reduced flows in the River Tame and subsequent impacts to fish passage at weirs and existing fish passes on the Tame and Trent; impacts to qualifying features of the SAC: river lamprey and sea lamprey, due to disruption of their migration upriver. Assessment of potential changes in river temperature and dissolved oxygen (DO). Predicted negative impacts at Sites (Weirs) 7 and 8, though currently no modelled impacts	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	regime in the Tame and Trent results in effects to fish passage (migratory and potamodromous species) at weirs and existing fish passes Impacts to qualifying features of the SAC: river lamprey and sea lamprey							on river / sea lamprey (qualifying features of the SAC / SSSI) passability: - Site 7 – A4097 Weir (Tame); - Site 8 – Nether Whitacre Weir (Tame); and - Holme Sluices – potential changes in the operational window of the fish pass and changes to temperature and dissolved oxygen in the river Tame and Trent.	
	Humber Estuary SAC/Ramsar/SSSI. Impacts on European Sites as a result of reduced flows in the Rivers Tame and Trent, and associated changes to water quality. Potential changes in river temperature and DO Predicted changes in flow regime, water quality, and connectivity with the River Trent Potential impacts to salinity due to reduced freshwater flowing into the Humber Estuary and corresponding effects on flora and fauna	In (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	Reduced effluent discharge from Minworth WwRC results in reduced flows in the Rivers Tame and Trent, and corresponding effects on fish passage and other receptors relevant to the European Sites. Further assessment is required to determine the potential effects on the Habitats Sites during operation, due to predicted changes in flow regime, water quality, and connectivity with the River Trent. Potential impacts to salinity flowing into the Humber Estuary and corresponding effects on flora and fauna.	n/a
	River Mease SAC / SSSI. Impacts on SAC as a result of reduced flows in the Rivers Tame and Trent, and associated changes to water quality, hydrological regime, and connectivity with the River Mease at its	In (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	Further assessment is required to determine the potential effects on the European Habitats site during operation.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	confluence with the Trent								
	Ensor’s Pool SAC/SSSI No impact pathway, therefore, no potential effects. European Habitats Sites within the Zol of the Proposed Development, but not hydrologically connected.	n/a	n/a	Out	n/a	n/a	n/a	n/a	Impacts on Ensor’s Pool SAC have been screened out from resulting in a likely significant effect due to lack of hydrological connectivity between the Proposed Development and the SAC and the distance from the Proposed Development to the SAC and intervening urban environment resulting in no hydrological connectivity. No impact pathway (and thus potential effect) during operation for any European Habitats sites of interest to aquatic ecology for Part 2.
	SAC, Ramsar: Upper Nene Valley Gravel Pits SPA / Ramsar / SSSI Impacts to water quality and hydrological pathways during operation Drayton and Daventry Reservoirs are upstream in the headwaters of the River Nene catchment. Altered operational regime of the reservoirs may result in water quality impacts and flow changes in the downstream receiving water body in the River Nene catchment	n/a	n/a	n/a	In	n/a	n/a	Potential impact pathway (and thus potential effect) during operation of Drayton and Daventry Reservoirs, including alterations in hydrological regime, e.g. water quality.	n/a
	<i>Nationally statutory designated sites</i>								
	River Blythe SSSI. Potential impacts to qualifying features of designated sites during operation due to modelled changes in low flows.	In (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	Scoped in for further assessment due to interaction of reductions in flows in the River Tame with a submerged weir at the downstream end of the River Blythe and potential effects on fish passage.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Attenborough Gravel Pits SSSI Holme Pit SSSI Mother Drain, Misterton SSSI Farndon Ponds LNR Plantsbrook Reservoirs LNR Potential impacts to qualifying features of designated sites during operation due to minimal changes in low flows	Out (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	n/a	Potential effects to these water dependent sites as a result of the operation of Part 1a of the Proposed Development due to the minor changes in flow in the River Trent have been shown to be insignificant through hydrological modelling, surface water and groundwater assessment. All these sites do not depend upon water supply at times of low flow in the River Trent, and therefore will not be affected by the minimal modelled reductions in flow at these locations.
	Adjacent to or nearby the Tame and Trent: Donington Park SSSI Whitacre Heath SSSI Attenborough Gravel Pits SSSI Holme Pit SSSI Lockington Marshes SSSI Lea Marsh SSSI Humber Estuary SSSI (features other than lamprey spp.) Changes in connectivity of the SSSI to the rivers Tame or Trent as a result of reduced flows Potential effects of surface and groundwater connectivity	Out (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	n/a	All of these SSSIs are sufficiently distant from the Tame and Trent to avoid impacts to surface water supply due to minimal reductions in flows in the rivers as a result of Part 1a of the Proposed Development. SSSIs are otherwise dependent on rainfall or flooding (including from other rivers/tributaries) for surface water supply – high flows and flood events in the rivers would remain unaffected by the operation of the Proposed Development. All SSSIs are not dependent on groundwater supply from the rivers Tame or Trent, and therefore there would be no impacts due to the modelled minimal reductions in flows in the rivers.
	Blue Lagoon LNR (900 m west) Daventry Country Park LNR (within Part 3; 0 m of GUC) Ensor's Pool LNR (961 m south west of Coventry Canal)	n/a	In	In	In	In	In	Potential impacts to water quality and hydrological pathways during operation.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Newbold Quarry LNR (226 m East of Oxford Canal) Swift Valley LNR (1.2 km east of Oxford Canal). Changes to water quality and hydrological connectivity and regime (flows, levels) during operation.								
	Tameside LNR. Change in connectivity of water bodies in the LNR to the river Tame due to reductions in flow in the Tame.	In (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	Hydraulic modelling and site connectivity assessment at Gate 3 ² indicates that a pipe culvert / channel connecting the Tame to 'Smiley Face Pool' in the LNR will become disconnected from the river Tame at low flows. This connection provides fish refuge and connectivity, and further assessment is required to assess impacts of reduced connectivity.	n/a
	<i>Non-statutory designated sites</i>								
	Daventry Reservoir LWS, and Drayton Reservoir pLWS Changes to water quality and operational regime of the reservoirs during operation Changes to reservoir draw-down zone	n/a	n/a	n/a	In	n/a	n/a	Utilisation of the reservoirs will change as a result of operation of the Proposed Development. The reservoirs may remain fuller for longer but may be drawn down over a period of days, resulting in a drop in levels. Potential impacts to qualifying features of designated sites during operation, e.g. changes in water quality and hydrological regime, changes in the frequency of draw-down, resulting in impacts to marginal habitats and aquatic species.	n/a
	River Tame LWS: Potential impacts on water quality and hydrological regime during operation	In (incl. Tame and Trent)	n/a	n/a	n/a	n/a	n/a	The River Tame LWS is approximately 189 m south east from the AWTP working area, and hydrologically connected to the WwRC via the final effluent channel. Reduced discharge of recycled water from Minworth WwRC may result in reduced flows in the River Tame and corresponding effects on aquatic habitats and species, including designated features of the LWS.	n/a

² It is expected that RAPID Gate 3 Reports will be published prior to Statutory Consultation and preparation of the Preliminary Environmental Information Report.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	LWS or equivalent (pLWS; County Wildlife Site CWS): Part 1b: 42 non-statutory designated sites. Part 2: 12 sites. Part 4: 34 sites. Potential hydrological changes and impacts to water quality during operation.	n/a	In	In	n/a	In	In	Potential impacts on water quality and hydrological effects during operation.	n/a
	LWS or equivalent: 22 LWS or equivalent. Potential effects of hydrological changes during operation resulting in altered connectivity with the River Tame. (Connectivity to the River Trent is modelled to remain unchanged).	Out (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	n/a	22 LWS or equivalent sites designated in part for aquatic ecology are located within 2 km of the rivers Tame and Trent. All are scoped out on the basis that modelled hydrological changes will be insignificant and will not have an adverse effect on aquatic habitats.
	Unconnected to the canal network (LWS, and CWS). No change expected.	n/a	n/a	Out	n/a	n/a	n/a	n/a	Modelling and design assumptions indicate that there will be no impacts to aquatic receptors in sites unconnected to the canals, and no changes in flows over waste weirs to receiving water bodies.
	<i>Habitats</i>								
	Rivers and streams: potential to qualify as Rivers HPI (includes Main Rivers, ordinary watercourses, and ditches), including the River Ouzel chalk stream Potential changes in water quality and hydrological effects during operation Fragmentation of habitats or populations due to changes in	In	In	In	In	In	In	The Rivers Tame and Trent receive recycled water from Minworth WwRC and are hydrologically connected to the site. Multiple tributaries are connected to the Tame and Trent. Indirect impacts due to the Proposed Development dividing a habitat, group of related habitats, sites or ecological network, or the creation of partial or complete barriers to the movement of species, with a consequent impairment of ecological function (e.g. changes in hydrological regime affecting the ability of species to disperse and subsequent disconnection of aquatic populations).	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	hydrological regime Reduced discharge of recycled water from Minworth WwRC, and corresponding changes in water quality in the River Tame/Trent – changes in dilution regime; changes in temperature and dissolved oxygen Potential spread of INNS during operation							The importance of these habitats in supporting aquatic species, their sensitivity to changes in water quality, and as migratory routes for fish, will be established to inform the impact assessment.	
	Canals (Coventry Canal, Oxford Canal, GUC): Changes in flow rates, hydrological regime, and water quality due to operation of the Proposed Development Alteration of bank structure/marginal vegetation through operation	n/a	n/a	In	n/a	n/a	n/a	Alteration to the functioning of the canals as ecological corridors during operation; fragmentation of aquatic populations due to increased flow rate and changes in hydrological regime. Changes in water quality (e.g. temperature and DO) may affect the ecological functioning of the canals. Increased flows may result in changes to marginal habitats and vegetation, and sedimentation regime, and may facilitate the spread of INNS along the canals. Canals may be recognised as priority habitats in LBAP, which will be established by on-going baseline assessment.	n/a
	Standing water (reservoirs and ponds): Changes to water quality and operational regime of the reservoirs during operation Changes to reservoir draw-down zone Potential changes in water quality and hydrological regime during operation	In	In	In	In	In	In	Utilisation of the reservoirs (Part 3) will change as a result of operation of the Proposed Development. The reservoirs may remain fuller for longer but may be drawn down over a period of days, resulting in a drop in levels. Potential impacts to standing water habitats during operation (all Parts), e.g. changes in water quality and hydrological regime, changes in the frequency of draw-down, resulting in impacts to marginal habitats and aquatic species. Potential changes in hydrological connectivity between the rivers / canals and nearby areas of standing water, and impacts from changes in	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	INNS introduction to standing water bodies due to water transfers during operation							water quality and altered flow regime.	
<i>Species</i>									
	Aquatic species (macroinvertebrates, macrophytes, fish): Changes in water quality and hydrological regime	In	In	In	In	In	In	Changes in water quality and hydrological regime in all water bodies may result in changes to aquatic communities and interactions.	n/a
	Fish (passage of migratory and resident species): Potential barriers to fish passage on the river Tame and Trent.	In (Tame and Trent only) Out (Site 11 only)	n/a	n/a	n/a	n/a	n/a	Potential barriers to fish passage on the river Tame and Trent (25 barriers of which 10 located on the River Tame and 15 on the River Trent). Site 7 (A4097 weir) has been scoped in given that the Proposed Development is predicted to have a negative impact for salmon and trout passability. Site 8 (Nether Whitacre Weir) has been scoped in because the Proposed Development is predicted to have a negative impact on fish passability, due to the reduction in depths and increase in hydraulic head associated with the reduction on flows but no impact on river/sea lamprey passability. Holme Sluices – potential changes in the operational window of the fish pass; and changes to temperature and dissolved oxygen in the river Tame.	Site 11 (Meadow Weir) was scoped out due to the Proposed Development not expected to have an impact on the overall passability and the site already being considered a ‘complete barrier’ for all flows and species for the baseline situation, limited by depths (passage through the fish pass unimpacted). All the remaining barriers have been scoped out given that there is no modelled impact on passability for any fish species.
	Fish (impacts to fish passage for migratory and resident species) Reduced fish passage due to reduced flow in the River Tame	Out (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	n/a	Potential barriers to fish passage in the river Tame, screened out of further assessment at Gate 2. Site 1: Orton Weir – The Environment Agency advised that achieving improved fish passability at this site at low flows (Q70 or lower) is not critical. In addition, it is located just upstream of the main Minworth discharge. As such it was screened out of further assessment at Gate 2. Site 2. Water Orton Lane road bridge – site visit determined that this was not a barrier to fish passage, given it is a bridge with flowing river beneath it. It is located just upstream of the main Minworth discharge. As such it was screened out of further assessment at Gate 2.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Fish species assemblage: Reduced dilution in the Rivers Tame and Trent affecting fish olfaction	In (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	Changing concentrations of chemicals in the River Tame as a result of operation of Part 1a of the Proposed Development – diversion of effluent away from the River Tame and resulting changes in dilution or chemical inputs. On-going water quality monitoring to inform further update of water quality model. Further monitoring of cypermethrin in the River Tame utilising a lower limit of detection. When the results of on-going monitoring are available, the mass balance calculations for cypermethrin will be updated accordingly. Update of water quality modelling to inform assessment of impacts to aquatic ecology, notably on fish olfaction.	n/a
	Fish assemblage in the canals including juvenile fish: Increased flow rate in canals Changes in water quality Alterations in habitat availability and shelter for juvenile fish (e.g. vegetation)	n/a	n/a	In	n/a	n/a	n/a	Flow impacts – increased flow in the canals due to the transfer results in greater flow velocities, shown at Gate 2 to be potentially too high for juvenile fish. Corresponding impacts to marginal habitats and vegetation. Updated hydraulic modelling at the location of the Atherstone discharge, to inform assessment of impacts to fish assemblage, including juvenile fish. Impacts to water quality, causing high turbidity and associated effects, changes to temperature and dissolved oxygen at the Atherstone outfall, for example from poaching and tilled land adjacent to the canal. To be informed by further sediment mobilisation and contaminant assessment. On-going water quality modelling to inform the impact assessment of dissolved oxygen, temperature, and other parameters.	n/a
	Fish – European Eel: Entrainment and entrapment of eel at pumps, bypasses, and abstractions during operation Potential for European eel to become entrained or trapped during operation, which	n/a	n/a	In	In	n/a	n/a	Installation of pumps, bypasses, outfalls, and abstractions presenting barriers to eel and the risk of eel entrainment and/or mortality. The canals do not represent a typical migratory pathway for eel. Eels enter the canal from connected water bodies and are subsequently disconnected from migratory pathways. Further consultation with the Environment Agency to be undertaken regarding the application of Eel Regulations and eel passage	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	may constitute an offence under the Eel Regulations							guidance to canal infrastructure, considering the point above.	
	Fish species: smelt. Potential impact on fish assemblage.	Out (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	n/a	Smelt were scoped out at Gate 1 given that Environment Agency records of this species are for the Humber Estuary and not the Rivers Tame and Trent.
	Aquatic macroinvertebrates: Changes in water quality and hydrological regime. Aquatic macrophytes: Changes in water quality and hydrological regime. Increased flows in the canals leading to increased risk of detachment and possible blocking of intakes and navigation. Lowered turbidity in upper reaches leading to improved growth.	In (incl. Tame and Trent)	n/a	In	In	n/a	n/a	Aquatic macroinvertebrates: Diverse aquatic macroinvertebrate and macrophyte assemblage in rivers, canals, and standing water bodies has been identified through surveys. Changes in water quality and alteration to hydrological regime in the Rivers Tame and Trent, canals, or other watercourses, and corresponding effects on macrophytes and macroinvertebrates. Assessment of the likelihood of macrophyte detachment due to increased flows in the canals. On-going water quality modelling to inform further assessment of effects on aquatic macrophytes. Monitoring of INNS spread in the canals and reservoirs informed by on-going ecological surveys.	n/a
	White-clawed crayfish. No impact pathway, therefore, no potential effects.	Out	Out	Out	Out	Out	Out	n/a	Through desk study and eDNA surveys, it has been established that white-clawed crayfish are absent from all parts of the Proposed Development.
	Algal blooms in Daventry and Drayton reservoirs. Potential increased risk of algal blooms during operation.	n/a	n/a	n/a	In	n/a	n/a	The Trust report indicates that there have been historical algal bloom issues at both Drayton and Daventry Reservoirs. Blue-green algae was reported to be present at Drayton Reservoir in October 2014 and October 2016. Blue-green algal blooms were reported at Daventry Reservoir, most notably in September 2010 and July 2011. Potential risk of algal blooms during operation, e.g. due to water quality impacts. On-going water quality monitoring and modelling to inform the assessment of the risk	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								of algal blooms.	
	<i>INNS</i>								
	INNS (macroinvertebrates, macrophytes, and fish INNS): Spread and/or establishment of INNS during operation.	In (incl. Tame and Trent)	n/a	In	In	n/a	n/a	Increased risk of INNS transfer during operation due to water transfer from Minworth AWTP to the canals and onward. Pathway risk assessment of INNS transfer, both within the Proposed Development working areas and beyond, for example along the Rivers Tame and Trent, and to water bodies hydrologically connected to the canal network.	n/a
	INNS (macroinvertebrates, macrophytes, and fish INNS): Reduction in river levels within the River Tame may allow INNS species to further colonise. Increased flow in canals. Spread of INNS from GUC to reservoirs	In (Tame and Trent only)	n/a	n/a	n/a	n/a	n/a	Given the prevalence of INNS in the river Tame under existing conditions, this was assessed as low risk at Gate 2. However, the potential impacts of the increased spread of INNS in the rivers Tame and Trent requires further assessment through the EIA. Potential for habitat destabilisation (with the potential to facilitate relevant INNS, i.e., those not already widespread), following reduction in flow in the River Tame.	n/a

Table 24-6: Summary of the scoping of potential effects – Ecology - Terrestrial

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 13: Ecology – Terrestrial	Construction								
	<i>Statutory designated Sites</i>								
	Indirect impacts to statutory designated sites of international importance beyond 2 km of the Proposed Development, potentially hydrologically connected with the EIA Scoping Boundary. Upper Nene Valley SPA / Ramsar site.	n/a	n/a	Out	In	Out	Out	A potential impact pathway (and thus potential effect) to Upper Nene Valley SPA / Ramsar site has been identified due to the works to Drayton and Daventry Reservoirs, which are upstream in the headwaters of the River Nene catchment. As such, the Upper Nene Valley Gravel Pits SPA / Ramsar has been scoped in for further assessment.	Ensor Pool's SAC/ SSSI and Chilterns Beechwood SAC / SSSI, which are within the study area of Part 2 of the Proposed Development, are not hydrologically connected to the EIA Scoping Boundary of the Proposed Development and as such, have been scoped out of further assessment.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Ensor Pool's SAC/ SSSI Chilterns Beechwood SAC / SSSI								
	Direct impacts to statutory designated sites from construction and temporary works, resulting in habitat degradation and loss: - Wyken Slough LNR; - Daventry Country Park LNR; and - Cottage Bottom Fields LNR.	n/a	n/a	In	In	n/a	In	Three statutory designated sites are wholly or partially located within the EIA Scoping Boundary. The construction works may result in habitat degradation or loss at Wyken Slough LNR (due to a potential access track in Part 2), Cottage Bottom Fields LNR (due to pipeline installation in Part 4b) and Daventry Country Park LNR (due to the new pipeline, inlet and outlet at the reservoir in Part 3). The construction works may result in habitat degradation or loss at the three LNRs, due to a potential pipeline construction works (including access track and material storage).	n/a
	Temporary direct effects on statutory designated sites due to: - Airborne pollution within 200 m of the EIA Scoping Boundary; - Run-off to these sites, due to their hydrological connection with the EIA Scoping Boundary; and - Compaction of tree root system. Designated sites include: Whitacre Heath SSSI; Bentley Park Wood SSSI; Wyken Slough LNR; Daventry Country Park LNR; Dunstable and Whipsnade Downs SSSI; Kings and Bakers Wood and Heaths SSSI; Dallow	n/a	In	In	In	n/a	In	Construction activities may result in deposition of airborne pollutants from vehicle or plant emissions. Within 200 m of the Proposed Development there are 10 statutory designated sites. In addition, construction activities may have an impact on hydrological pathways connected to designated sites through run off pollutants or sediment. Where designated sites are located within or adjacent to the EIA Scoping Boundary, tree roots are at risk from damage and/or compaction, for example through use of a new access track by vehicles.	There are no statutory designated sites within 200 m of Part 1a or Part 4a of the Proposed Development. As such, this matter has been scoped out of the assessment for these parts of the Proposed Development.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Downs and Winsdon Hill SSSI; Cottage Bottom Fields LNR; Kensworth Chalk Pit SSSI; and King's Wood and Rushmere NNR								
	Indirect effects on designated sites due to effects on hydrology	In	In	In	In	n/a	In	As identified within Chapter 22: Water Environment and Flood Risk , the following designated sites include surface water or groundwater dependent habitats and have the potential to be hydrologically connected to the Proposed Development: Whitacre Heath SSSI, Kingsbury Wood SSSI, Bentley Park Wood SSSI for Part 1, Wyken Slough LNR, Newbold Quarry Park LNR, Linnell Road LNR, Nares Gladley Marsh SSSI, the Swift Valley LNR and the Combe Pool SSSI for Part 2, the Daventry Country Park LNR for Part 3, and Cottage Bottom Fields LNR, Dallow Downs and Winsdon Hill SSSI, Kings Woods and Rushmere NNR, Dunstable and Whipsnade Downs SSSI, Kings and Bakers Wood and Heaths SSSI, Kensworth Chalk Pit SSSI, Totternhoe Knolls LNR and SSSI for Part 4b.	There are no statutory designated sites that include surface water or groundwater dependent habitats which have the potential to be hydrologically connected to the Proposed Development in relation to Part 4a.
	Indirect effects on designated sites due to disturbance of qualifying species	n/a	In	In	In	n/a	In	Construction activities may result in increase in noise, vibration, visual disturbance and temporary lighting which may adversely affect protected and/or notable species which are qualifying features of designated sites. For example, Whitacre Heath SSSI and Daventry Country Park LNR are notified for their wetland breeding birds; Whiteacre Heath SSSI includes breeding Snipe and Redshank, and overwintering hen harrier and short-eared owl. Wyken Slough LNR is noted for its wintering and breeding birds; Bentley Park Wood SSSI boundary noted for breeding black redstart. Cottage Bottom Fields LNR is known to support typical moorland birds such as. Wheatear, Whinchat, Stonechat and Ring Ouzel. Kings and Bakers Wood and Heaths SSSI National and Regional rarities of fungi and insects found in lowland heath and acidic grassland. Dunstable and Whipsnade Downs SSSI and Dallow Downs and Winsdon Hill SSSI are both known to support important	There are no statutory designated sites within 200 m of Part 1a and Part 4a of the Proposed Development.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								population of invertebrate in particular butterflies, including uncommon and local distribution species for the county.	
	<i>Non-Statutory Designated Sites</i>								
	Direct impacts to non-statutory designated sites from construction and temporary works, resulting in habitat degradation and loss.	In	In	In	In	In	In	Of the 487 non-statutory designated sites (including 247 pLWS / cLWS) identified with the study area, 38 LWS / CWS and 48 pLWS are located wholly or partially within the EIA Scoping Boundary. The construction works may result in habitat degradation, permanent and temporary habitat loss within these sites.	n/a
	Temporary direct effects on non-statutory designated sites due to: - Airborne pollution within 200 m of the EIA Scoping Boundary; - Run-off to these sites, due to their hydrological connection with the EIA Scoping Boundary; and - Compaction of tree root systems.	In	In	In	In	In	In	Construction activities may result in deposition of airborne pollutants from vehicle or plant emissions. Within the 200 m study area, there are 161 non-statutory sites; including 1 SINC, 79 LWS/CWS and 81 pLWS Construction activities may have an impact on hydrological pathways connected to designated sites through run off of pollutants or sediment. Where designated sites are located within or adjacent to the EIA Scoping Boundary, tree roots are at risk from compaction, for example through use of a new access track by vehicles.	n/a
	Indirect effects on non-statutory designated sites due to effects on hydrology.	In	In	In	In	In	In	There are 100 non-statutory designated sites within the study area, which include surface water or groundwater dependent habitats that have the potential to be hydrologically connected to the Proposed Development Non-statutory sites with groundwater or surface water dependent habitats (such as springs, wet heath, swamp (mesotrophic and reedbed), fen, wet woodland, wet grassland) could be indirectly impacted by changes in water level, water flow, water quality during the construction of the Proposed Development. Effects may include, causing habitat degradation or temporary loss during construction as a result of sediment or pollutant runoff via connecting watercourse.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								Which has the potential to cause damage / disturbance of qualifying species. The non-statutory designated sites are listed in Table 13-17 of Chapter 13: Ecology – Terrestrial.	
	Indirect effects on non-statutory designated sites due to disturbance of qualifying species.	In	In	In	In	In	In	Construction activities within 200m of non-statutory designated sites may result in increase in noise, vibration, visual disturbance and temporary lighting which may adversely affect protected and / or notable species which are qualifying features of designated sites. For example, Minworth Sewage Treatment Works SINC is noted for ornithological interest, Rawn Hill and Harthill's Quarries are known to support reptiles and amphibians, River Avon & tributaries LWS is known for its diverse bankside habitat which support water vole and otter. Daventry Country Park LWS and Lea Marston Lake LWS are notified for its wetland breeding birds. Coventry Canal pLWS is noted for invertebrates and amphibians; and the Oxford Canal pLWS is known to support water vole and otters. Wyken Slough LWS is noted for its wintering and breeding birds; Thrump Covert LWS listed as a nesting site for wetland birds. Whipsnade Downs CWS is known for its rare butterfly population and Waterhall Park LWS is known to support amphibians. Other sites to be assessed will be identified within the ES.	n/a
	<i>Habitats</i>								
	Direct impacts (potentially irreversible) to ancient woodland from construction and temporary works, resulting in habitat degradation and loss.	n/a	In	n/a	n/a	n/a	In	There are 23 areas of ancient woodland located within 200 m of the EIA Scoping Boundary for Parts 1b, 2 and 4b; however, none are located within the EIA Scoping Boundary itself, but nine are located adjacent to the EIA Scoping Boundary for Parts 1b and 4b . The construction works may result in loss of ancient trees or habitat degradation, including ground flora and shrub layer in the woodland.	There are no areas of ancient and semi-natural woodland within the EIA Scoping Boundary of Parts 1a, 2, 3 or 4a of the Proposed Development. As such, this matter has been scoped out of the assessment for Parts 1a, 2, 3 and 4a of the Proposed Development.
	Temporary direct effects on ancient woodlands due to:	n/a	In	In	n/a	n/a	In	There are 23 areas of ancient woodland located within 200 m of the EIA Scoping Boundary for Parts 1b, 2 and 4b. Construction	There are no areas of ancient woodland within 200 m of the EIA Scoping Boundary of Parts 1a, 3 and 4a of the Proposed Development. As

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	- Airborne pollution within 200 m of the EIA Scoping Boundary; - Run-off to nearby sites and those hydrologically connected with the EIA Scoping Boundary; and - Compaction of tree root systems.							activities may result in the deposition of airborne pollutants (e.g. dust) from vehicle or plant emissions in these areas. Construction activities may have an impact on ancient woodland through run off of ground pollutants (from vehicles and plant) or sediment whilst moving soils. Ancient woodland tree roots are at risk from compaction and impacts to seed bed during soil movements.	such, this matter has been scoped out of the assessment for Parts 1a, 3 and 4a of the Proposed Development.
	Permanent, direct loss of habitats during construction, including priority habitats	In	In	In	In	In	In	The desk study identified eight main priority habitat types within the study area. Any new above ground infrastructure may result in the loss of priority habitats.	n/a
	Direct temporary damage or loss of, or changes to, habitats, including priority habitats	In	In	In	In	In	In	There is also a risk of causing habitat degradation from temporary works including ground investigation and placement of storage and welfare facilities. This could also cause loss and severance of commuting and foraging habitats during construction.	n/a
	Indirect temporary effects on groundwater and surface water dependent habitats, including priority habitats, due to hydrological changes	In	In	In	In	In	In	There is a risk of causing habitat degradation or loss due to changes in hydrology and water quality.	n/a
	Direct and long-term effects on habitat type and condition during habitat reinstatement and enhancement. Habitats such as, coastal and floodplain grazing marsh, deciduous woodland, good quality semi-improved grassland, lowland meadows, lowland fens, hedgerows, ponds, and traditional orchard.	In	In	In	In	In	In	Direct impacts associated with changes in land use resulting from the Proposed Development, including habitat reinstatement will be considered within the assessment.	n/a
	<i>Protected and notable species</i>								

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Direct and indirect effects to protected and notable species during construction, including: • Amphibian • Badger • Bird • Bat • Reptile • Otter • Water vole • Other Mammals • Terrestrial Invertebrates • Plants	In	In	In	In	In	In	Construction works may result in the following direct and indirect effects: • Killing and injury of protected and notable species. • Disturbance/displacement of protected and notable species through permanent and temporary habitat loss. • Temporary disturbance of protected and notable species due to noise, visual disturbance, artificial lighting and vibration. • Displacement of protected and notable species through temporary habitat severance and fragmentation. • Changes to the habitat type and condition during habitat reinstatement and enhancement.	n/a
	Potential to introduce and/ or spread invasive non-native species and disease	In	In	In	In	In	In	Eighteen species of invasive non-native species have been identified with the study area. The construction works may result in unintentionally spreading of unidentified invasive non-native species and degradation of the original habitat.	n/a
Operation									
<i>Statutory designated sites</i>									
	Indirect impacts to statutory designated sites of international importance beyond 2 km of the Proposed Development hydrologically connected with the EIA Scoping Boundary Upper Nene Valley SPA and Ramsar Ensor Pool's SAC/ SSSI Chilterns Beechwood SAC / SSSI	n/a	n/a	Out	In	n/a	Out	A potential impact pathway (and thus potential effect) to Upper Nene Valley SPA/ Ramsar site has been identified due to the works to Drayton and Daventry Reservoirs, which are upstream in the headwaters of the River Nene catchment. As such, the Upper Nene Valley Gravel Pits SPA / Ramsar has been scoped in for further assessment.	Ensor Pool's SAC / SSSI and Chilterns Beechwood SAC / SSSI are not hydraulically connected to the EIA Scoping Boundary of the Proposed Development and as such, have been scoped out of further assessment.
	Direct and indirect effects on statutory designated sites due to effects on hydrology,	In	In	In	In	n/a	In	Operational activities, such as habitat management and maintenance, may result in sediment run off or biological pollutants (e.g. invasive species).	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	e.g. due to impacts on surface water or groundwater flows and quality							As identified within Chapter 22: Water Environment and Flood Risk , the following designated sites include surface water or groundwater dependent habitats and have the potential to be hydraulically connected to the Proposed Development: Whitacre Heath SSSI, Kingsbury Wood SSSI, Bentley Park Wood SSSI for Part 1, Wyken Slough LNR, Newbold Quarry Park LNR, Linnell Road LNR, Nares Gladley Marsh SSSI, the Swift Valley LNR and the Combe Pool SSSI for Part 2, the Daventry Country Park LNR for Part 3, and Cottage Bottom Fields LNR, Dallow Downs and Winsdon Hill SSSI, Kings Woods and Rushmere NNR, Dunstable and Whipsnade Downs SSSI, Kings and Bakers Wood and Heaths SSSI, Kensworth Chalk Pit SSSI, Totternhoe Knolls LNR and SSSI for Part 4b.	
	Indirect effects on designated sites due to disturbance of qualifying species	Out	Out	Out	Out	Out	Out	n/a	Disturbance to qualifying features of statutory designated sites from the operation and maintenance of the Proposed Development is likely to be limited and unlikely to be significant. There is no permanent operational noise or lighting associated with Parts 1b pipeline, 3 and 4b of the Proposed Development. Any maintenance works would be ad hoc and limited. In addition, there are no statutory designated sites in close vicinity to Part 1a, Part 1b break pressure tank, Part 2 pumping stations and Part 4a of the Proposed Development. As such, this impact pathway (and thus potential effect) is scoped out of further assessment.
<i>Non-statutory designated sites</i>									
	Direct and indirect effects on non-statutory designated sites due to effects on hydrology, e.g. due habitat management and maintenance All non-statutory designated sites located wholly or partially within the EIA Scoping Boundary for Parts 1, 3, and 4, and	In	In	In	In	In	In	Of the 487 non-statutory designated sites (including 247 pLWS / cLWS) identified with the study area, 38 LWS / CWS and 48 pLWS are located wholly or partially within the EIA Scoping Boundary. The operational works may result in habitat degradation, permanent and temporary habitat loss within these sites.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	within the Indicative Work Area for Part 2. Refer to Appendix 13-1 for a full list.								
	Direct and indirect effects on non-statutory designated sites due to effects on hydrology, e.g. due to impacts on surface water or groundwater flows and quality	In	In	In	In	In	In	Operational activities, such as habitat management and maintenance, may have an impact on hydrological pathways connected to non-designated sites and result in sediment run off or biological pollutants (e.g. invasive species). A review of waterbodies connected with the canal network, the reservoir and other watercourses will be carried out to understand the risk of likely significant effects from the changes to the flow or quantity of water entering the watercourse caused by the Proposed Development operations.	n/a
	Indirect effects on non-statutory designated sites due to disturbance of qualifying species	In	In (break pressure tank only)	In (pumping stations)	Out	In	Out	Disturbance from the operation of Part 1a, Part 1b break pressure tank, Part 2 pumping stations and Part 4a on adjacent non-statutory designated sites due to operational noise and lighting has been scoped in on a precautionary basis.	There is no permanent operational noise or lighting associated with Parts 1b pipeline, 3 and 4b of the Proposed Development. Any maintenance works would be ad hoc and limited. As such, this impact pathway (and thus potential effect) has been scoped out for these parts of the Proposed Development.
	<i>Habitats</i>								
	Permanent impacts to ancient woodland from operations	Out	Out	Out	Out	Out	Out	n/a	There are no anticipated effects on ancient woodland, due to the nature of the operational and maintenance works of the Proposed Development.
	Effects on priority habitats due to the implementation of landscape design, habitat management and maintenance.	In	In	In	In	In	In	The desk study identified 8 main priority habitat types within the study area, wholly or partially located within the EIA Scoping Boundary. Site operation and management, e.g. maintenance operations required to create or enhance habitats will be summarised within the ES.	n/a
	Indirect effects on groundwater and surface water dependent habitats, including priority habitats, due to hydrological changes.	In	In	In	In	In	In	There is a risk associated with operational impacts on groundwater and surface water flows and quality, such as increased flows or quantities of water entering watercourses or feeding reliant habitats during the operation and maintenance activities of the Proposed Development.	n/a
	<i>Protected and notable species</i>								

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Disturbance/displacement of protected and notable species through increased disturbance during operation, including on: • Amphibians; • Badger; • Birds; • Bats; • Reptile; • Otter; • Water vole; • Other Mammals; and • Invertebrates.	In	In (break pressure tank)	In	Out	In	Out	The Proposed Development may result in increased levels of disturbance, depending on the activity this may comprise visual, lighting and noise disturbance. Nocturnal species (such as barn owl, bats, otters and/or badgers) are at risk of disturbance and potentially displacement from the use of artificial lighting during operational phase. Sensitive species such as otter, badger and barn owl are likely to be displaced from habitats where there is an increase in human activity.	There is no permanent operational noise or lighting associated with Parts 1b pipeline, 3 and 4b of the Proposed Development. Any maintenance works would be ad hoc and limited. As such, this impact pathway (and thus potential effect) has been scoped out for these parts of the Proposed Development.
	Indirect effect on protected or notable species through hydrological changes	In	n/a	In	In	In	n/a	There is a risk of changes to flow or quantity of water entering watercourses as a result of the operation and maintenance activities of the Proposed Development which could affect protected or notable species such as water vole and otter.	Parts 1b and 4b scoped out, as there is no direct interaction with watercourses in this part of the Proposed Development.
	Potential introduction and or spread of non-native species and disease	In	n/a	In	In	In	n/a	Potential release of invasive non-native species during routine habitat and post construction maintenance activities and washouts.	Parts 1b and 4b are scoped out, as there is no direct interaction with watercourses in this part of the Proposed Development.

Table 24-7: Summary of the scoping of potential effects – Ground Conditions

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 14: Ground Conditions	Construction								
	Geology / Geological Designated Sites: Damage, disturbance or removal of geological features of interest (geological SSSI, Local Geological Sites (LGS), Regionally Important	In	In	In	In	In	In	There is potential for disturbance of geological features of interest (permanent adverse effects), and these are therefore scoped in to the assessment.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Geological and Geomorphological Sites (RIGS) and Geological Conservation Review (GCR) sites)								
	Effects on Mineral Safeguarding Areas (MSA) / Mineral Conservation Areas (MCA): Temporary mineral severance or sterilisation	In	In	In	In	In	In	There may be some adverse effects during the construction period to the identified MSA / MCA (through temporary severance / sterilisation).	n/a
	Mobilisation and migration of existing potential sources of contamination, due to: • Ground disturbance during earthworks, excavations, trenching and other techniques; • Open excavations; • Uncovered stockpiles; and • Dewatering. Historical and current land use has the potential to have caused a legacy of contamination which may pose a risk to the receptors within and in proximity of the EIA Scoping Boundary during construction The current use of the EIA Scoping Boundary and Study Areas has been evaluated using OS mapping	In	In	In	In	In	In	<u>Effects on groundwater</u> Direct effects on the aquifers associated with the superficial deposits and any potential groundwater abstractions may occur due to the intrusive nature of earthworks, trenching, trenchless construction, tunnelling (and associated shafts) and piling (as required). The significance of the disturbance would be dependent on the depth of the aquifer unit in relation to the proposed depth of the intrusive works and the nature of any potential contaminated soil or groundwater in the area. Direct effects on the aquifers and Source Protection Zones (SPZ) associated with the bedrock geology and any potential groundwater abstractions may occur from deep ground workings associated with trenchless construction, tunnelling (and associated shafts) or piling (as required). There is potential for contaminants to migrate along newly created preferential pathways which could cause a deterioration of groundwater quality. Surface layers would be excavated allowing increased infiltration of rainwater and surface run-off which could potentially mobilise existing sources of contamination and create new pathways.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								Potential for contaminants in unsaturated soils to be exposed to surface water run-off and to leach to groundwater in open excavations. Potential impacts from migration of contaminants from uncovered stockpiles to groundwater receptors.	
		In	In	In	In	In	In	<u>Effects on surface water and ecological and geological sites</u> Creation of preferential pathways for the migration of soil contamination via groundwater, installation of temporary drainage, surface water run-off and uncovered stockpiles. Ecological and geological receptors, including features of designated sites that are sensitive to nitrogen or acid deposition, may be impacted by significant increases in dust.	n/a
		In	In	In	In	In	In	<u>Effects on human health (adjacent and/or nearby users)</u> Potential temporary adverse impacts to nearby residents and commercial workers from excavation works, and the movement and stockpiling of soils. These impacts are more likely in areas where contamination may be encountered. Construction works may alter migration pathways or create new preferential pathways that did not previously exist between a source and receptor. This could result in impacts to human health through dermal contact, inhalation (inclusive of vapours and ground gases) and ingestion of contaminants.	n/a
		Out	Out	Out	Out	Out	Out	n/a	<u>Effects on human health (construction and maintenance workers)</u> Impacts on human health from contamination within unsaturated soil (dust and fine particulate matter) and groundwater. There may be some temporary adverse effects during the construction period due to the introduction of human health receptors (construction workers). However, these receptors will be protected by health and safety legislation and mitigation (e.g. identified through

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
									health and safety risk assessment prior to work commencing) and are therefore scoped out.
	Introduction of new sources of contamination, such as fuels, oils and other fluids used in construction plant	In	In	In	In	In	In	<u>Effects on controlled waters receptors and ecological / geological sites</u> These potential impacts are temporary in nature given the approach to construction. The potential impacts will likely be mitigated by the embedded and good practice measures; mitigation measures dealing with the risk of accidental spills or contaminants will be incorporated, with risks managed through the implementation of industry standard best practice guidelines, for example, appropriate use of chemicals, spill response and pollution contingency plans, careful design of HDD arcs, minimum clearance from river beds. Effects on controlled waters receptors will be considered within Chapter 22: Water Environment and Flood Risk and, therefore, will not be repeated in the ground conditions assessment. Effects on ecological sites will be considered within Chapter 12: Ecology – Aquatic and Chapter 13: Ecology – Terrestrial and therefore, will not be repeated within the ground conditions assessment. Effects on geological sites, however, will be considered within the ground conditions chapter. Potential effects on controlled waters receptors and ecological / geological sites as a result of the introduction of new sources of contamination will be considered further within the ground conditions chapter.	n/a
		In	In	In	In	In	In	<u>Effects on human health</u> These potential impacts are temporary in nature given the approach to construction. The potential impacts will likely be mitigated by the embedded and good practice measures; mitigation measures dealing with the risk of accidental spills or contaminants will be suggested, with risks managed through the implementation of industry standard best practice guidelines, for example, appropriate	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								use of chemicals, spill response, dust suppression, and pollution contingency plans. Potential effects on human health as a result of the introduction of new sources of contamination will be considered further within the ground conditions chapter.	
	Land contamination (from existing potential sources of contamination located within the EIA Scoping Boundary): Any contamination removed, remediated, or mitigated leading to removal of contaminant sources from the source – pathway – receptor linkage	In	In	In	In	In	In	May result in potential beneficial impacts on human health, controlled waters, property receptors and ecological receptors. There may be some permanent beneficial effects post-construction phase due to the removal of contaminant sources during construction works.	n/a
	Ground stability	In	In	In	In	In	In	The Applicant is confident that any potential for ground stability issues to arise during the construction phase will be adequately mitigated through detailed geotechnical desk studies, a Geotechnical Investigation Report (GIR) and a Geotechnical Design Report (GDR) which will be undertaken as part of the ongoing design process. A summary of the available information will be included in the ES chapter.	n/a
	Operation								
	Indirect and direct impacts as a result of the disturbance of ground for maintenance works and leakage / spillages of stored materials during the operational phase	Out	Out	Out	Out	Out	Out	n/a	Impacts to human health and controlled waters caused by land contamination are considered unlikely as maintenance and operation of the Proposed Development will be in accordance with good practice. Any unacceptable risk from contaminated land would have been addressed by remediation during construction stage. The Proposed Development will require an environmental permit under The Environmental Permitting (England and Wales) Regulations 2016 (Ref. 12), which will control operational discharges.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Effects on MSA / MCA: Permanent mineral severance or sterilisation	In	In	In	In	In	In	There may be permanent adverse effects during the operational period to the identified MSA and MCA (through permanent severance / sterilisation).	n/a
	Ground stability	In	In	In	In	In	In	The Applicant is confident that any potential for ground stability issues to arise during the operational phase will be adequately mitigated through detailed geotechnical desk studies, a GIR and GDR which will be undertaken as part of the ongoing design process. A summary of the available information will be included in the ES chapter.	n/a

Table 24-8: Summary of the scoping of potential effects – Humna Health

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 15: Human Health	Construction								
	Healthcare and other social infrastructure: Changes in access to and demand for healthcare services and other community facilities	In	In	In	In	In	In	The Proposed Development could lead to changes in access to healthcare services and other community facilities for residents of nearby residential receptors (including permanent residential moorings). This impact could arise from construction traffic or route diversions potentially impacting on accessibility, and through the additional burden of construction worker demand.	n/a
	Open space, play and leisure: Changes in availability and quality of public areas of open space and recreational walking and cycling routes	In	In	In	In	In	In	The Proposed Development could lead to changes in access to and quality of public areas of open space and recreational walking and cycling routes for residents during construction. The Proposed Development could also change levels of physical activity, including access to and use of canal towpaths.	n/a
	Transport modes, access and connections: Changes in vehicles on the local road network and public transport	In	In	In	In	In	In	The Proposed Development could lead to changes in traffic flows on the local road network and public transport during construction.	n/a
	Economic environment (employment and	In	In	In	In	In	In	The Proposed Development could create employment and supply chain opportunities, as well as offer temporary training and upskilling	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	income, education and training opportunities): Direct and indirect job creation and economic activity, as well as educational opportunities and support							opportunities such as apprenticeships during the construction phase.	
	Air quality: Changes in air pollutants from construction activities	Out	In	Out	Out	Out	In	The Proposed Development could lead to significant levels of, or harmful air pollutants from construction activities. Construction works at Part 1b and 4b are considered to have low dust generating potential, however due to the location of sensitive receptors immediately adjacent to the EIA Scoping Boundary, a construction dust risk assessment has been scoped in to Chapter 9: Air Quality and Odour . Therefore, there is potential for adverse health effects arising from compromised air quality during construction.	As set out in Chapter 9: Air Quality and Odour no significant air quality or amenity impacts from dust generation are likely at Parts 1a, 2, 3 and 4a if management measures are adopted. Therefore, air quality effects on human health would be managed by a Dust Management Plan and Odour Management Plan under the CoCP.
	Air quality. Changes in air pollutants from construction road traffic	Out	Out	Out	Out	Out	Out	n/a	As stated in Chapter 9: Air Quality and Odour , construction traffic emissions is scoped out of the EIA based on professional judgement concluding that it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria. Therefore, this is scoped out of the human health assessment.
	Noise and vibration: Changes in construction noise and vibration and road traffic noise	In	In	In	In	In	In	The Proposed Development could lead to potential significant noise effects in regard to construction noise and vibration and road traffic noise. This could lead to adverse impacts on residential amenity (including permanent residential moorings) and mental health and wellbeing.	n/a
	Landscape and visual amenity: Changes in visual amenity of public areas of open space, active travel walking and cycling routes	In	In	In	In	In	In	The Proposed Development could lead to changes in visual amenity of public areas of open space, active travel walking and cycling routes during construction. In addition the Proposed Development may prevent access to and connection with nature along the canal during construction which may impact the health and wellbeing of waterway users.	n/a
	Water quality: Changes in contaminated runoff,	In	In	In	In	In	In	The Proposed Development could lead to accidental leaks of hazardous substances during construction. This could adversely	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	spills, or leaks of hazardous substances and/or historical land uses							impact the health of residents within the local communities and users of public water supplies if water becomes contaminated.	
	Water availability: Changes in water availability during construction.	Out	Out	Out	Out	Out	Out	n/a	The Proposed Development is unlikely to lead to changes water availability during construction. Chapter 22: Water Environment and Flood Risk will be kept under review and if there are significant effects to the water environment that relate to human receptors, drinking or bathing water, this will be scoped in to the assessment of human health.
	Climate change mitigation and adaptation: Changes to GHG emissions, extreme weather events, flood risk, sea level rise, temperature change and rainfall change	In	In	In	In	In	In	Climate change poses a threat to the health, safety and security of the global population, both through direct hazards and indirectly due to damage to the living environment. GHG emissions from the construction phase could potentially have an indirect impact on human health, as emissions will contribute towards changing climatic conditions which may lead to extreme weather, heat and flood risk and exacerbation of cardiovascular and respiratory conditions.	n/a
	Health-related behaviours: physical activity; risk taking behaviour; diet and nutrition: Changes to levels of physical activity, risk taking behaviour and consideration for diet and nutrition	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, construction activity is not anticipated to impact physical activity, risk taking behaviour or diet and nutrition. Physical activity is scoped out as changes in physical activity will be covered under the open space, play and leisure health determinant.
	Housing: Changes to housing need and provision. Changes in access to residential properties	In	In	In	In	In	In	The Proposed Development could lead to temporary or permanent land take from residential properties including moorings. Additionally, there is potential for induced indirect severance impacts between residents and their homes. This could lead to adverse impacts on amenity and mental health and wellbeing.	n/a
	Social participation, interaction and support. Changes to opportunities for	Out	In	In	In	Out	In	Parts 1b, 2 and 3 and 4b of the Proposed Development could affect indoor or outdoor community assets and meeting places, for voluntary, social, cultural or spiritual	Given the absence of existing community assets at Parts 1a and 4a of the Proposed Development, construction activity is not

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	community participation and interaction, and for social and family support.							participation through potential displacement and land take impacts.	anticipated to impact social participation, interaction and support.
	Social environment: relocation; community safety; community identity; and culture, resilience and influence. Changes to perception and actual level of risk and crime. Changes to community identity such as sense of belonging.	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, construction activity is not anticipated to impact the social environment.
	Bio-physical environment – radiation: Changes to exposure to radiation risks	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, construction activity is not anticipated to impact radiation.
	Institutional and built environment – built environment; wider societal infrastructure and resources: Changes to features of the built environment and wider public health environment that contribute to physical and mental health outcomes	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, construction activity is not anticipated to impact the built environment or wider societal infrastructure and resources.
	Operation								
	Healthcare and other social infrastructure: Permanent changes in access to and demand for healthcare services and other community facilities	Out	Out	Out	Out	Out	Out	n/a	Activities associated with the operation of the Proposed Development will be minimal, such as maintenance, and unlikely to cause significant effects on community and social infrastructure, and therefore health effects as a result. While there are a number of community facilities in proximity to the Proposed Development, given the nature of the works and limited anticipated operational traffic, the operational phase of the Proposed Development is not expected to

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
									impact healthcare and other social infrastructure as a determinant of human health.
	Open space, play and leisure: Permanent changes in availability and quality of public areas of open space and recreational walking and cycling routes	Out	Out	Out	Out	Out	Out	n/a	Given the minimal nature of maintenance works, the Proposed Development is unlikely to lead to significant effects on open space, play and leisure as a determinant of human health beyond construction once complete and operational.
	Transport modes, access and connections: Permanent changes in vehicles on the local road network and public transport	Out	Out	Out	Out	Out	Out	n/a	Given the minimal nature of maintenance works, there is limited anticipated level of traffic once the Proposed Development is complete and operational. As such the Proposed Development is unlikely to impact transport modes, access and connections as a human determinant of health.
	Economic environment (employment and income, education and training opportunities): Operational direct and indirect job creation and economic activity, as well as educational opportunities and support	Out	Out	Out	Out	Out	Out	n/a	Given the minimal nature of maintenance works, it is anticipated the generation of operational employment and wider economic benefits will be limited.
	Air quality: Permanent changes in air pollutants from operational activities	Out	Out	Out	Out	Out	Out	n/a	Given the minimal nature of maintenance works and limited anticipated level of operational traffic, the Proposed Development is unlikely to impact air quality as a determinant of human health.
	Air quality. Changes in air pollutants from operational road traffic	Out	Out	Out	Out	Out	Out	n/a	As stated in Chapter 9: Air Quality and Odour , operational traffic emissions is scoped out of the EIA based on professional judgement concluding that it is considered unlikely that traffic flows would exceed threshold volumes in order to meet relevant criteria. Therefore, this is scoped out of the human health assessment.
	Noise and vibration: Permanent changes to noise and vibration and road traffic noise	In	In (Break Pressur e Tank only)	In	Out	In	Out	Chapter 18: Noise and Vibration identifies potential for noise effects at Part 1a, 1b (Break Pressure Tank only) 2 and 4a of the Proposed Development once complete and operational. As a result the Proposed Development could	Parts 1b (excluding Break Pressure Tank), 4b and 3 do not include any noise emitting operational plant. As such Chapter 18: Noise and Vibration scope out operational noise assessment for these parts as potential for noise effects are unlikely. Therefore, the Proposed

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
			Out (excl. Break Pressur e Tank)					impact noise as a determinant of human health.	Development is unlikely to impact noise and vibration as a determinant of human health at Parts 1b, 4b and 3.
	Landscape and visual amenity: Permanent changes in visual amenity of public areas of open space, active travel walking and cycling routes	In	In	In	In	In	In	Chapter 16: Landscape and Visual identifies potential for landscape and visual effects from the introduction of permanent infrastructure once the Proposed Development is complete and operational. As a result the Proposed Development could impact landscape and visual amenity as a determinant of human health.	n/a
	Water quality: Permanent changes in water quality.	In	In	In	In	In	In	Chapter 22: Water Environment and Flood Risk identifies that operational maintenance works have the potential to lead to the accidental release of hazardous substances into the ground and reach the water table, deteriorating the quality of groundwater. Therefore, impacts for the operational phase of the Proposed Development on drinking water quality have been scoped in to the assessment of human health.	n/a
	Water availability: Permanent changes in water availability	In	In	In	In	In	In	It is expected that the Proposed Development will increase the availability of water supply for Affinity Water customers. Impacts on drinking water quantity or access can lead to changes in human health.	n/a
	Climate change mitigation and adaptation. Permanent changes to GHG emissions, extreme weather events, flood risk, sea level rise, temperature change and rainfall change	In	In	In	In	In	In	Chapter 10: Climate identifies that GHG emissions from the operational phase could potentially have an indirect impact on human health, as emissions will contribute towards changing climatic conditions which may lead to extreme weather, heat and flood risk and exacerbation of cardiovascular and respiratory condition. As a result, the Proposed Development could lead to impacts on climate as a determinant of human health.	n/a
	Health-related behaviours: physical activity; risk taking behaviour; diet and nutrition. Permanent changes to levels of	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, operation is not anticipated to impact physical activity, risk taking behaviour or diet and nutrition.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	physical activity, risk taking behaviour and consideration for diet and nutrition								
	Housing. Permanent changes to housing need and provision.	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, the operational phase is not anticipated to lead to changes in housing provision beyond those impacts identified as permanent in the construction phase.
	Social participation, interaction and support. Permanent changes to opportunities for community participation and interaction, and for social and family support	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, the operational phase is not anticipated to impact social participation, interaction, and support beyond those impacts identified as permanent in the construction phase.
	Social environment: relocation; community safety; community identity; and culture, resilience and influence. Permanent changes to perception and actual level of risk and crime. Permanent changes to community identity and social participation such as sense of belonging.	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, operation is not anticipated to impact the social environment.
	Bio-physical environment: radiation. Permanent changes to exposure to radiation risks	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, operation is not anticipated to impact radiation.
	Institutional and built environment: built environment; wider societal infrastructure and resources. Permanent changes to features of the built environment and wider	Out	Out	Out	Out	Out	Out	n/a	Given the nature of the Proposed Development, operation is not anticipated to impact the built environment or wider societal infrastructure and resources.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	public health environment that contribute to physical and mental health outcomes								

Table 24-9: Summary of the scoping of potential effects – Landscape and Visual

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 16: Landscape and Visual	Construction								
	Physical and perceptual aspects of the landscape designations and Landscape Character Areas (LCA) within the Study Areas	In	In	In	In	In	In	There are sensitive landscape receptors as represented by designated landscapes and LCAs within the study areas for all parts of the Proposed Development, as such the assessment of landscape character has been scoped into the EIA. Temporary effects may occur on physical and perceptual aspects of the landscape designations and LCAs within the study areas as a result of activities associated with construction, vegetation loss, temporary structures, and other elements.	n/a
	Visual effects on visual receptors, based on identified representative views	In	In	In	In	In	In	Temporary effects on visual receptors, based on identified representative viewpoints (VP) (VP1 to VP39). There are sensitive visual receptors within the study areas and, where applicable, the Zone of Theoretical Visibility (ZTV) extent for all parts of the Proposed Development, as such the assessment of visual amenity has been scoped into the EIA.	n/a
	Operation								
	Physical and perceptual aspects of the landscape designations and LCAs within the study areas	In	Out	In	In	In	In (partly)	Effects resulting from permanent structures, vegetation loss and/or earthworks. Assessment limited to targeted consideration of effects that are permanent and where reinstatement during the construction phase is not feasible. There are sensitive landscape receptors as represented by designated landscapes and LCAs within the study areas for all parts of the Proposed Development, as such the assessment of landscape character has been scoped into the EIA.	The assessment of pipelines outside the National Landscape (Parts 1b and sections of Part 4b) are scoped out as majority will be underground and reinstated as part of the construction phase. Landscape effects would also be outside the extent of the study areas.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Visual effects on visual receptors, based on identified representative views	In	In (Break Pressur e Tank only) Out (excl. Break Pressur e Tank)	In	In	In	In (partly)	Visual effects resulting from permanent structures, vegetation loss and/or earthworks based on identified representative viewpoints (VP1 to VP39). There are sensitive visual receptors within the study areas and where applicable ZTV extent for Parts 1a, 1b (Break Pressure Tank only) 2, 3, 4a and 4b of the Proposed Development, as such the assessment of visual amenity has been scoped into the EIA.	Assessment of the pipelines (Parts 1b and 4b) as will be underground, and areas will be predominantly reinstated as part of the construction phase. Visual effects would be outside the extent of the study areas. A separate night-time assessment is scoped out due to anticipated limited lighting associated with the Proposed Development.

Table 24-10: Summary of the scoping of potential effects – Major Accidents and Disasters

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 17: Major Accidents and Disasters	Construction and Operation								
	Major accident and disaster risks	Out	Out	In	In	Out	Out	Following the review of the major accident and disaster baseline risks and the risks that could be introduced by the Proposed Development (as set out by Appendix 17-1: Scoping of Major Accident and Disaster Risks within Volume 3 of this EIA Scoping Report), it is concluded that the following potential risk events could occur during the construction and operational phases of Parts 2 and 3 of the Proposed Development which are not already addressed by other EIA topics: Boating incidents on the canal network or reservoirs. As such, this has been scoped in for further assessment.	The following possible major accident and disaster risks are either adequately covered elsewhere in the EIA, do not pose a significant risk in the context of the Proposed Development or are mitigated by proposed design measures or compliance with legislation and best practice, as signposted within Appendix 17-1: Scoping of Major Accident and Disaster Risks within Volume 3 of this EIA Scoping Report: - Flooding from rivers, surface water, groundwater, reservoirs, canals and sewers; - Storms; - Droughts; - Heatwaves; - Low temperatures and heavy snow; - Wildfires; - Ground or structural collapse; - Fire / explosion; - Pipeline burst; - Pollution incidents; - Impairment, interruption or severance of existing utilities (electricity, gas, water and telecommunications); - Full or partial obstruction of emergency services;

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
									• Outbreak of disease including animal health-notifiable disease, emerging infectious disease and pandemic influenza; • Severe meteorology; • Earthquakes; • Volcanic eruptions; • Road Traffic Accident on the wider traffic network; and • Railway incident. As such, these risks have been scoped out of the Major Accidents and Disasters assessment.

Table 24-11: Summary of the scoping of potential effects – Noise and Vibration

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 18: Noise and Vibration	Construction								
	Direct temporary noise impacts on sensitive receptors	In	In	In	In	In	In	The construction phases will include noise emitting activities which could temporarily increase noise levels at sensitive receptors. Construction will introduce additional road traffic which could temporarily increase road traffic noise levels at sensitive receptors.	n/a
	Direct temporary vibration impacts on sensitive receptors (including canal infrastructure)	In	In	In	In	In	In	The construction phases will include vibration emitting activities which could temporarily increase vibration levels at sensitive receptors (including canal infrastructure).	n/a
	Operation								
	Direct permanent noise impacts on sensitive receptors	In	In (Break Pressur e Tank only) Out (excl. Break Pressur e Tank)	In	Out	In	Out	The operational phase will include above ground noise emitting plant which may have a permanent effect on sensitive receptors.	Parts 1b (pipeline) and 4b pipeline and Part 3 do not include any noise emitting operational plant.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Direct permanent vibration impacts on sensitive receptors	Out	Out	Out	Out	Out	Out	n/a	None of the proposed permanent installations are expected to generate levels of vibration that could potentially give rise to significant effects at nearby noise and/or vibration sensitive receptor (NVSR). Furthermore, a commitment is made to ensure all relevant mechanical elements are fitted manufacturer recommended anti-vibration mounts and that the structure of each permanent installation provides an adequate level of vibration isolation such that no significant levels of vibration are emitted into the environment.
	Direct permanent noise impacts on sensitive receptors due to increased road traffic	Out	Out	Out	Out	Out	Out	n/a	The Proposed Development is not expected to generate significant additional traffic flows once operational and will be primarily limited to operators of the Minworth AWTP (Part 1a) and abstraction, storage and treatment site in Part 4a, and maintenance visits, as required, to the two pipelines (Part 1b and 4b) and canal network (Parts 2 and 3). Therefore, no significant noise levels are anticipated during operation.

Table 24-12: Summary of the scoping of potential effects – Socio-economics

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 19: Socio-economics	Construction								
	Temporary direct and indirect employment generation	In	In	In	In	In	In	The Proposed Development could create direct and indirect jobs in terms of employment and supply chain opportunities, as well as safeguarding jobs in existing areas of supply chains during the construction phase.	n/a
	Gross Value Added (GVA) generation	In	In	In	In	In	In	The Proposed Development could create GVA during construction which could positively impact on the economy.	n/a
	Promotion / provision of training and apprenticeship opportunities	In	In	In	In	In	In	The Proposed Development may offer temporary training and upskilling opportunities such as apprenticeships.	n/a
	Impacts on local and private assets (including residential	In	In	In	In	In	In	The Proposed Development may result in disruption / reduced access to assets as well as impacts upon the amenity of these assets.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	properties, local businesses, community facilities, open space/recreation and visitor attractions) via direct works or indirect via in combination effects identified by other discipline assessments								
	Impact on agricultural land holdings	n/a	In	n/a	n/a	In	In	Impacts on agricultural land holdings within Part 1b, 4a and Part 4b may comprise agricultural land take.	n/a
	Impacts on the use of the canal network as a recreational and leisure resource via direct works or indirect via in combination effects identified by other discipline assessments	n/a	n/a	In	In	n/a	n/a	The Proposed Development may result in disruption / reduced access to the canal network as well as impacts upon the amenity of the canal network for recreational and leisure users.	n/a
	Impacts on the use of the canal for commercial uses via direct works or indirect via in combination effects identified by other discipline assessments	n/a	n/a	In	In	n/a	n/a	The Proposed Development may result in temporary disruption / reduced access to the canal network.	n/a
	Land use impacts on planned and proposed developments	In	In	In	In	In	In	The Proposed Development may impact ongoing development activity and take up or impact access to development land.	n/a
	Temporary disruption to Public Rights of Way (PRoW) access and canal towpath access	In	In	In	In	In	In	The Proposed Development may result in disruption / reduced access to PRoW and canal towpaths for users through diversions and temporary closures during construction.	n/a
	Impacts on temporary accommodation facilities	In	In	In	In	In	In	The peak daily construction workforce may put temporary demand pressure / impact upon the hotels, bed and breakfast temporary accommodation sector.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Impacts on the tourism sector	Out	Out	In	In	Out	Out	The assessment will consider the potential for temporary likely significant effects on canal-based tourism, accounting for the assessments of effects on businesses, recreational and leisure users, visitor attractions and accommodation facilities through which tourism is associated and wider catalytic impacts to assess the overall effect on the sector as a whole.	There is no canal-based tourism activity which could be impacted by the Proposed Development in relation to Parts 1a, 1b, 4a and 4b.
	Operation								
	Permanent direct and indirect employment generation.	Out	Out	Out	Out	Out	Out	n/a	While the Proposed Development is likely to generate beneficial employment impacts, these are not likely to be significant during the operational phase.
	GVA generation.	Out	Out	Out	Out	Out	Out	n/a	Due to the likely low levels of operational employment, GVA generation would be minimal during operation and not likely to be significant.
	Promotion/ provision of training and apprenticeship opportunities.	Out	Out	Out	Out	Out	Out	n/a	While the Proposed Development is likely to generate beneficial impacts in terms of training and apprenticeship provision, these are not likely to be significant during the operational phase.
	Impacts on local and private assets (including residential properties, local businesses, community facilities, open space and visitor attractions), either via direct works or indirect via in combination effects identified by other discipline assessments.	Out	Out	Out	Out	Out	Out	n/a	Effects on local and private assets are not likely beyond the construction phase, as activities associated with the operation of the Proposed Development such as maintenance will be minimal and unlikely to cause significant effects on local and private assets.
	Impacts on the use of the canal network as a recreational and leisure resource directly through operation via direct works or indirectly via in combination effects identified by other discipline assessments	Out	Out	In	In	Out	Out	The Proposed Development may result in changes to the ability of recreational and leisure users to use the canal network.	The Proposed Development would not result in changes to the ability of recreational and leisure users to use the canal network in these sections.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Impacts on the use of the canal network for commercial uses via direct works or indirect via in combination effects identified by other discipline assessments	Out	Out	In	In	Out	Out	The Proposed Development may result in changes to the ability of commercial users to use the canal network.	The Proposed Development would not result in changes to the ability of commercial users to use the canal network in these sections.
	Permanent disruption to PRow access and canal towpath access	Out	Out	Out	Out	Out	Out	n/a	Impacts on PRow (including any permanent impacts) are likely to occur during construction and would be assessed as construction phase effects. Any effects on PRow and canal towpath arising from maintenance activities would be minimal and not likely to be significant.
	Impact on accommodation facilities	Out	Out	Out	Out	Out	Out	n/a	The operation of the Proposed Development is not likely to require a large workforce, and therefore any effects on accommodation facilities, are likely to be minimal.
	Impact on the tourism sector	Out	Out	In	In	Out	Out	The assessment will consider the potential for likely significant effects on canal-based tourism, accounting for the assessments of effects on businesses and recreational and leisure users through which tourism is associated and wider catalytic impacts to assess the overall effect on the sector as a whole.	There is no canal-based tourism activity which could be impacted by the Proposed Development for these Parts of the Proposed Development.
	Land use impacts on planned and proposed development	Out	Out	Out	Out	Out	Out	n/a	Land use impacts on planned and proposed developments are unlikely during operation as operational activities such as maintenance are likely to be minimal and no land take is expected, therefore effects are not likely to be significant.

Table 24-13: Summary of the scoping of potential effects – Traffic and Transport

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 20: Traffic and Transport	Construction								
	Construction impact on severance of communities	In	In	In	In	In	In	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on severance of communities has been scoped into the EIA.	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Construction impact on pedestrian delay	In	In	In	In	In	In	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on pedestrian delay has been scoped into the EIA. PRoWs may also be subject to a permanent diversion or temporary closure, causing delay to pedestrians, and are therefore scoped into the EIA.	n/a
	Construction impact on non-motorised user amenity	In	In	In	In	In	In	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on non-motorised user amenity has been scoped into the EIA. PRoWs may also be subject to temporary closure/diversion, causing disruption to non-motorised user amenity and are therefore scoped into the EIA.	n/a
	Construction impact on fear and intimidation on and by road users	In	In	In	In	In	In	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on fear and intimidation on and by road users has been scoped into the EIA.	n/a
	Construction impact on road vehicle driver and passenger delay	In	In	In	In	In	In	There are potential sensitive receptors within the study area for construction for all Parts of the Proposed Development, as such assessment of construction traffic impact on vehicle driver and passenger delay has been scoped into the EIA.	n/a
	Construction impact on hazardous/large loads	Out	Out	Out	Out	Out	Out	n/a	The construction of the Proposed Development would not likely generate significant hazardous/large loads. However, this will be addressed within a Transport Assessment (TA).
	Operational								
	Operational impact on severance of communities	Out	Out	Out	Out	Out	Out	n/a	Operational traffic will primarily comprise operators of the Minworth AWTP (Part 1a) and abstraction, storage and treatment site in Part 4a, and maintenance visits, as required, to the two pipelines (Part 1b and 4b) and canal network (Parts 2 and 3).
	Operational impact on pedestrian delay	Out	Out	Out	Out	Out	Out		
	Operational impact on non-motorised user amenity	Out	Out	Out	Out	Out	Out		

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Operational impact on fear and intimidation on and by road users	Out	Out	Out	Out	Out	Out		The expected level of traffic generated during operation (including maintenance) would not result in potential significant effects. Existing canal navigation will not be significantly impacted by the Proposed Development as it will be designed accordingly to allow canal users to continue to navigate the canal with minimal disruption. Refer to Chapter 17: Major Accidents and Disasters with regards to canal navigation risks. If PRoWs are permanently diverted, the assessment of the effects is scoped into the EIA; however, this is not currently proposed.
	Operational impact on road vehicle driver and passenger delay	Out	Out	Out	Out	Out	Out		
	Operational impact on hazardous/large loads	Out	Out	Out	Out	Out	Out		

Table 24-14: Summary of the scoping of potential effects – Materials and Waste

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 21: Materials and Waste	Construction								
	Changes in demand for materials	In	In	In	In	In	In	The quantities and type of construction materials to be used in construction are not yet known at this stage. As such on a precautionary basis, impact on landfill capacity has been scoped into the EIA.	n/a
	Waste arising from extraction, processing and manufacture of construction components and products	Out	Out	Out	Out	Out	Out	n/a	This is based on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and therefore outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured.
	Other environmental impacts associated with the management of waste from the Proposed Development e.g., on water resources, air quality, noise or traffic resulting from the generation, handling,	Out	Out	Out	Out	Out	Out	n/a	These are addressed separately in other relevant chapters of this EIA Scoping Report (refer to Chapter 9: Air Quality and Odour , Chapter 14: Ground Conditions , Chapter 18: Noise and Vibration , Chapter 20: Traffic and Transport and Chapter 22: Water Environment and Flood Risk of this EIA Scoping Report).

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	on-site temporary storage or off-site transport of materials and waste								
	Changes in available landfill void capacity (for both hazardous and non-hazardous waste)	In	In	In	In	In	In	The quantities and type of waste to be generated during construction is not yet known. As such on a precautionary basis, impact on landfill capacity has been scoped into the EIA.	n/a
	Changes to safeguarded mineral and waste sites	Out	In	In	In	Out	Out	Impacts on safeguarded waste and mineral sites for Parts 1b, 2 and 3 of the Proposed Development have been scoped into the assessment, due to the overlap of the EIA Scoping Boundary with the safeguarded sites.	There are no active safeguarded mineral and waste sites in Parts 1a, 4a and 4b.
	Operation								
	Changes in availability of materials	Out	Out	Out	Out	Out	Out	n/a	Forecast effects on material use are considered negligible (using professional judgement on the likely type and volume of materials), whilst considering the scale and nature of the Proposed Development.
	Other environmental impacts associated with the management of waste from the Proposed Development, e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste	Out	Out	Out	Out	Out	Out	n/a	These are addressed separately in other relevant chapters of this EIA Scoping Report (refer to Chapter 9: Air Quality and Odour , Chapter 14: Ground Conditions , Chapter 18: Noise and Vibration , Chapter 20: Traffic and Transport and Chapter 22: Water Environment and Flood Risk of this EIA Scoping Report).
	Changes in available landfill void capacity	In	Out	Out	Out	In	Out	Pipelines, the canal network and reservoirs will require minimal maintenance during operation and will generate negligible volumes of waste in relation to the scale and nature of the proposed development. During operation, Parts 1a and 4a of the Proposed Development will generate waste. The quantities and type of waste to be generated in operation is not yet known and as such, operational waste has been scoped in for further assessment.	Parts 1b, 2, 3 and 4b will require minimal maintenance during operation and will generate negligible volumes of waste in relation to the scale and nature of the Proposed Development.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
	Changes to safeguarded mineral and waste sites	Out	Out	Out	Out	Out	Out	n/a	Changes to safeguarded minerals and waste sites are not anticipated during operation and are considered during the construction phase only.

Table 24-15: Summary of the scoping of potential effects – Water Environment and Flood Risk

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
Chapter 22: Water Environment and Flood Risk	Construction								
	Deterioration of groundwater quality in aquifers, GWDTEs, abstraction points and WFD water bodies by accidental spillage or uncontrolled construction runoff	In	In	In	In	In	In	Construction works have the potential for the accidental release of fuels, oils and lubricants, indirectly via connected surface water bodies or into the ground and migrate towards and reach the water table, within the underlying aquifer, or directly via the aquifer. Where excavation works are required or there is a lack of superficial deposits, the risk of pollution becomes heightened. Off-site construction of materials will act to reduce the probability of groundwater pollution.	n/a
	Disturbance of existing contamination in groundwater	Out	Out	Out	Out	Out	Out	n/a	Construction works have the potential to disturb existing contamination within the ground, which could then migrate towards and reach the water table within the underlying aquifer. Scoped out for this chapter as this is included as part of the scope in Chapter 14: Ground Conditions .
	Deterioration of groundwater quality in aquifers, GWDTEs, abstraction points and WFD waterbodies by disturbance of existing contamination	Out	Out	Out	Out	Out	Out	n/a	The accidental release or disturbance of existing contamination has the potential to impact on groundwater quality directly within the underlying aquifer, and indirectly at connected receptors, such as GWDTEs and abstraction points (public and private water supplies). Scoped out for this chapter as this is included as part of the scope in Chapter 14: Ground Conditions .
	Changes in groundwater levels and flows in aquifers, GWDTEs, abstraction points and WFD waterbodies	In	In	In	In	In	In	Groundwater flows and levels could be impacted by below ground construction works, and by dewatering activities, directly by altering natural groundwater flow pathways within the underlying aquifer, or indirectly by altering groundwater contributions to GWDTEs and abstraction points (public and private water	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								supplies). This impact is thought to be regional and localised around the proximity of the works; however, may have impacts on Public Water Supply (PWS) and base flow conditions to rivers.	
	Increased risk of groundwater flooding	In	In	In	In	In	In	Where natural groundwater flows and levels are altered, there is the potential for an increased risk of groundwater flooding. This may be heightened where the water table is close to the ground surface and excavated material which would act as groundwater storage is removed.	n/a
	Changes to surface water flows from impacting groundwater	In	In	In	In	In	In	Changes to groundwater flow direction and patterns may act to alter surface water flows. Where wetland habitats exist, groundwater and effluent may act to stabilise surface water flows and increase base flow to nearby rivers (Part 1b, River Tame). Pumping or dewatering of groundwater levels may act to reduce surface water and base flows.	n/a
	Construction works may affect surface water / watercourse flow patterns and sediment mobilisation	In	In	In	In	In	In	There may be temporary risks associated with flow diversions or sediment mobilisation into watercourses during construction.	n/a
	Increased risk in fluvial or surface water flooding	In	In	In	In	In	In	Temporary works may alter above ground flow pathways or increase surface water runoff which may increase flooding elsewhere. Potential for siltation and blockages within the drainage systems causing failure or improper function, which could impact hydrology through flooding. Temporary increase in flooding through localised impoundments or diversions of river / canal / reservoirs flows.	n/a
	Increase in residual risk of flooding from reservoirs	Out	Out	In	In	Out	Out	Temporary works downstream of the reservoir may cause temporary changes to downstream flood flow pathways putting different or more receptors at a residual risk of flooding. Temporary works could also undermine the integrity of the dam, causing an increase in the likelihood of failure.	Parts 1a, 1b, 4a and 4b are not located in proximity to the risk of flooding from reservoirs flood extents associated with the Daventry and Brayton reservoirs (Parts 1a and 1b are approximately 43 km north-east and Parts 4a and 4b are approximately 42 km south-west).
	Increased risk of flooding from canals	Out	Out	In	Out	In	Out	Temporary works may cause localised impoundments or disturbance of canal banks leading to an increase in the residual risk of	No temporary works to the canals are proposed in Parts 1a, 1b, 3 and 4b.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								flooding or increase in spills over waste weirs impacting surrounding watercourses.	
	Impacts on surface water quality	In	In	In	In	In	In	Due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals (including ‘frac-out’ events leading to spillage of drilling fluids during shallow non-intrusive trenchless crossing installations operations), or through mobilisation of contamination following disturbance of contaminated ground or groundwater, or through uncontrolled site run-off. Due to disturbance of river and/or canal bed sediment which may be contaminated and/or decrease dissolved oxygen due to disturbance of organic matter. Earthworks during construction and the presence of permanent infrastructure could alter surface water flows.	n/a
	Deterioration of surface water dependent terrestrial ecosystems (SWDTE) and protected sites	In	In	In	In	In	In	There are SWDTEs in the study areas of all parts of the Proposed Development. The impact of construction works on these will be considered as part of the EIA.	n/a
	Operation								
	Deterioration of groundwater quality in aquifers, GWDTEs, abstraction points and WFD waterbodies by accidental spillage	In	In	In	In	In	In	Planned and unplanned operational maintenance works, including pipeline washouts, have the potential for the accidental release of fuels, oils and lubricants, indirectly via connected surface water bodies or into the ground and migrate towards and reach the water table, within the underlying aquifer, or directly via the aquifer.	n/a
	Changes in groundwater levels and flows in aquifers, GWDTEs, abstraction points and WFD waterbodies	In	In	In	In	In	In	Permanent above ground infrastructure has the potential to change the recharge rate of rainfall to the underlying aquifers, while permanent below ground infrastructure has the potential to alter natural groundwater flow pathways.	n/a
	Reduction in water available for abstractors from the Rivers Tame and Trent	In	Out	Out	Out	Out	Out	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development has the potential to reduce available water in the Rivers Tame and Trent, affecting abstractors from those River Systems. Particularly where the change in hydrological regime could change the	Abstractions located within Parts 1b, 2, 3, 4a and 4b are not sourced from the Rivers Tame and Trent.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								frequency with which ‘Hands off Flow’ conditions are triggered for abstraction licences. Modelling during the gated RAPID process has identified that storage mitigation in the Daventry and Drayon Reservoirs has the potential to mitigate this effect and is to be developed and considered further as part of the EIA.	
	Sediment transport changes and hydro-ecological condition deterioration in the Rivers Tame and Trent	In	Out	Out	Out	Out	Out	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development has the potential to change water levels and flow velocities at lower flows in the Rivers Trent and Tame. These changes could affect sediment transport and affect hydromorphological condition/habitat availability for some sections of the rivers. Modelling during the gated process has identified that these changes are likely to be limited; however, further modelling is being undertaken to understand this impact pathway (and thus potential effect) whilst making an allowance for climate change for the future baseline assessment.	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development in Parts 1b, 4a and 4b does not have the potential to change water levels and flow velocities at lower flows in the Rivers Trent and Tame, therefore sediment transport etc will not be affected.
	Deterioration of water quality in the Rivers Tame and Trent, the canals and the Daventry and Drayton Reservoirs	In	Out	In	In	Out	Out	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development has the potential to change water quality in the Rivers Tame and Trent by altering pollutant loads and dilution. Likewise, discharges of treated water to the canal network, and abstraction into the Daventry and Drayton Reservoirs has the potential to impact water quality in these features. This includes changes in key sanitary determinants, dissolved oxygen and other polluting substances.	The diversion of a proportion of the Minworth WwRC discharge for operation of the Proposed Development in Parts 1b, 4a and 4b does not have the potential to change water levels and flow velocities at lower flows in the Rivers Trent and Tame due to these being controlled sites (Part 4a abstraction, treatment and storage) or passages (i.e. Parts 1b and 4b pipelines), therefore water quality will not be affected.
	Enhanced biological benefit	In	In	In	In	In	In	Creation of wetland habitats as part of Part 1a of the Proposed Development will aid in groundwater stability which support GWDTEs. Any enhancement proposed by other parts of the Proposed Development will be considered as part of the EIA.	n/a
	Increase in flood risk from canals	Out	In	In	In	In	Out	There are some mechanisms whereby flood risk from the canals during the operational phase could be increased such as: Additional flow entering the canal network raising water levels that cause overtopping	Potential impacts associated with flood risk are unlikely to occur in Parts 1a and 4b as these parts are not located in proximity to the canal section which will be altered by the Proposed Development.

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								of banks, this could be exacerbated if the rise in water levels causes bridges to surcharge. - Potential increase in velocities (particularly at bridges and constrictions) in the canals causing structural damage (via scour) and an increase in flood risk (thought to be minor based on results so far). - Rapid drawdown of Drayton and Daventry reservoirs which may lead to flow being transferred back into the GUC too quickly and subsequent impacts on the canal embankments downstream of Braunston Tunnel. - Under sizing of the transfer infrastructure into and out of the Daventry and Drayton reservoirs could lead to overtopping of the canal embankments.	
	Increased surface water flooding risk	In	In	In	In	In	In	There are some mechanisms whereby surface water flood risk during the operational phase could be increased: - New above ground scheme components (such as the AWTP, Break Pressure Tank, pumping stations) may cause an increase in runoff elsewhere. - Increase in impermeable areas may cause an increase in surface water runoff. - Above ground components of the Proposed Development may alter surface water flood flow pathways.	n/a
	Increase in fluvial flood risk	In	In	In	In	In	In	There are a few mechanisms whereby fluvial flood risk during the operational phase could be increased: - Permanent above ground structures placed in the floodplain could displace floodplain storage or divert flood flow pathways and increase flood risk elsewhere. - Rise in water levels in the canal network could increase discharge over the waste weirs (potentially exacerbated if the rise in water levels causes bridges to surcharge), thus increasing the flow into the surrounding watercourses and potentially flood risk. This could occur upstream of the Braunston Tunnel and also downstream of Braunston	n/a

Topic Chapter	Potential Effect	Proposed Development						Rationale/Justification	
		Part 1a	Part 1b	Part 2	Part 3	Part 4a	Part 4b	In	Out
								Tunnel if there is a rapid drawdown of the Daventry and Drayton reservoirs. Inadequate design / sizing of the transfer infrastructure into and out of the Daventry and Drayton reservoirs could lead to an increase in discharge in spills over the waste weirs, increasing flows in the receiving watercourses and potentially an increase in flood risk.	
	Changes to flow patterns and sediment mobility	Out	Out	In	Out	Out	Out	There is some potential for local impacts from maintenance requirements, such as dredging for navigation around locks, which needs to be investigated further. These impacts would be highly localised and are unlikely to be significant, but nevertheless are scoped in for further assessment.	Maintenance works that would cause changes to flow or sediment mobility (such as dredging) would not be required in Parts 1a, 1b, 3, 4a and 4b therefore there is no potential for local impacts.
	Deterioration of SWDTEs and protected sites	In	In	In	In	In	In	There are SWDTEs in the study areas of all parts of the Proposed Development. The impact of any changes in water quality on these will be considered as part of the EIA.	n/a

24.2 References

- Ref. 1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at: <https://www.legislation.gov.uk/uksi/2017/572/contents> [Accessed 25/03/2025].
- Ref. 2 Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed 25/03/2025].
- Ref. 3 The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009. Available at: <https://www.legislation.gov.uk/uksi/2009/2264/contents/made> [Accessed 25/03/2025].
- Ref. 4 Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Commitments Register. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-commitments-register> [Accessed 25/03/2025].
- Ref. 5 Institute of Environmental Management and Assessment (IEMA) (2022) A New Perspective on Land and Soil in Environmental Impact Assessment, Available at: <https://www.iema.net/resources/blog/2022/02/17/launch-of-new-eia-guidance-on-land-and-soils> [Accessed 25/03/2025].
- Ref. 6 Institute of Air Quality Management (IAQM) (2024). Guidance on the Assessment of Dust from Demolition and Construction Dust Guidance. Available at: <https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf> [Accessed 25/03/2025].
- Ref. 7 IAQM (2017) Guidance on Land-Use Planning & Development Control: Planning For Air Quality. Available at: <https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf> [Accessed 25/03/2025].
- Ref. 8 British Standards Institution (BSI) (2023) PAS 2080: Carbon Management in Buildings and Infrastructure.
- Ref. 9 The Eels (England and Wales) Regulations 2009. Available at: <https://www.legislation.gov.uk/uksi/2009/3344/contents> [Accessed 25/03/2025].
- Ref. 10 Canal and River Trust (2014) Blue-green algae spotted at Drayton Reservoir. [Online].
- Ref. 11 Canal and River Trust (2016) Report of Blue-Green Algae - Drayton Reservoir. [Online].
- Ref. 12 The Environmental Permitting (England and Wales) Regulations 2016. Available at: <https://www.legislation.gov.uk/uksi/2016/1154/contents/made> [Accessed 25/03/2025].

