East Midlands Gateway
Phase 2 (EMG2)

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ENVIRONMENTAL STATEMENT

Technical Appendices

Appendix 13F

Water Framework Directive (WFD) Screening

October 2025

13

The East Midlands Gateway Phase 2 and Highway Order 202X and The East Midlands Gateway Rail Freight and Highway (Amendment) Order 202X

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ENVIRONMENT

SEGRO (Properties) Ltd
East Midlands Gateway Phase 2 (EMG2)

Water Framework Directive Screening – EMG2 Project

July 2025

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Legislative Context

1.2 The WFD 2000/60/EC, enacted into English law through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[1], aims to preserve and improve the ecological health of water bodies.

1.3 A 'water body' is a manageable unit of surface water, being the whole (or part) of a stream, river or canal, lake or reservoir, transitional water (estuary) or stretch of coastal water. A 'body of groundwater' is a distinct volume of groundwater within an aquifer or aquifers.

1.4 The WFD aims to ensure that all surface and groundwater bodies reach a 'good status', or 'good ecological potential' for heavily modified and artificial water bodies. Overall ecological status (or potential) is made up of a number of biological, hydromorphological and chemical quality characteristics called 'elements'. The overall status is determined by the lowest element status.

1.5 The WFD sets out a number of Environmental Objectives for all surface and groundwater bodies that must be met in order for a proposed scheme to be compliant with the WFD. The Environmental Objectives are as follows:

- prevent deterioration of the status of each body of surface water and groundwater;
- protect, enhance and restore each body of surface water (other than an artificial or heavily modified water body) and groundwater with the aim of achieving good ecological status, good surface water chemical status and good groundwater quantitative status, if not already achieved;
- protect and enhance each artificial or heavily modified water body with the aim of achieving good ecological potential and good surface water chemical status, if not already achieved;
- aim progressively to reduce pollution from priority substances and aim to cease or phase out emissions, discharges and losses of priority hazardous substances;
- prevent or limit the input of pollutants into groundwater; and
- reverse any significant and sustained upward trend in the concentration of any pollutant resulting from the impact of human activity in order to progressively reduce pollution of groundwater.

1.6 The Environment Agency (EA) is the competent authority for implementing the WFD in England and has reported water body status and objectives via a series of River Basin Management Plans (RBMP). As part of its role, the EA considers whether proposals for

[1] Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, https://www.legislation.gov.uk/uksi/2017/407/contents/made

new developments have the potential to affect the environmental objectives of the WFD in protecting the water environment as set out in the RBMPs.

1.7 Planning for any new development that has the potential to impact water bodies should, therefore, ensure that the proposals are assessed for compliance against WFD objectives.

1.8 The following points, derived from the WFD Environmental Objectives, will determine whether the proposed development supports the overarching objectives of the WFD:

- The proposed development will not cause deterioration in the status of the water body.
- The proposed development will not compromise the ability of the water body to achieve its WFD status objectives.
- The proposed development will contribute to the delivery of the WFD status objectives of the water body.

1.9 The Environmental Objective relating to artificial or heavily modified water bodies is not discussed further as the water bodies within the study area do not fall into this category.

1.10 The Planning Inspectorate publish guidance for Nationally Significant Infrastructure Projects (NSIPs). Advice Note 18[2] relates to the WFD and summarises the requirements of the WFD Regulations for NSIP applications. Whilst this is non-statutory advice, it is intended to provide good practice. This sets out that the screening stage "*should identify the extent to which the proposed development is likely to affect water bodies*" and should:

- "*show all relevant WFD water bodies on a map or plan;*
- *identify the zone or zones of influence based on specific activities and/or characteristics of the proposed development that could affect the identified water bodies; and*
- *identify any specific activities and/or characteristics of the proposed development that have been screened out and why*."

Situational Context and Development Proposals

1.11 The proposed development comprises a number of interrelated component parts as follows, and collectively they are referred to as the EMG2 Project:

- **EMG2 Works:**
  - Construction of logistics and advanced manufacturing development and ancillary buildings (DCO, Works No. 1);
  - Construction of road infrastructure (DCO, Works No. 2);
  - Construction of bus interchange (DCO, Works No. 3);
  - Construction of HGV parking (DCO Works No. 4);

[2] Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive

- Provision of hard and soft landscaping (DCO Works No. 5);
- Creation of a Community Park (DCO, Work No. 21); and
- Upgrade of the EMG1 substation (DCO, Work No. 20)[3].

- **Highways Works**
  - A453 access junction works to the EMG2 Main Site (Works No. 6);
  - Hyam's Lane works (Works No. 7);
  - Works to the M1 northbound (Works No. 8);
  - Construction of link road from the M1 northbound to the A50 westbound (Works No. 9);
  - Works to the A50 westbound (Works No. 10);
  - Works to the link road from the M1 southbound and A50 eastbound to M1 Junction 24 (Works No. 11);
  - Works to the west side of the M1 Junction 24 roundabout and A453 northbound approach (Works No. 12a);
  - Works to the east side of the M1 Junction 24 roundabout and A453 southbound approach (Works No. 12b);
  - Improvements to the EMG1 access junction (Works No. 13);
  - Construction of the Active Travel Link between the EMG1 access junction and the A453 west of Finger Farm roundabout (Works No. 14);
  - Provision of an uncontrolled crossing of the A453 at the East Midland Airport signalised access junction (Works No. 15);
  - Works to M1 northbound signage on the approach to M1 Junction 23A (Works No. 16);
  - Works to Long Holden (Works No. 17);
  - Works to the A42/A453 Finger Farm roundabout (Works No. 18); and
  - Upgrade to public footpath L57 to a cycle track (Works No. 19).
- **EMG1 Works**
  - Construction of a new rail-served warehouse building on land adjacent to the rail-freight terminal referred to as Plot 16 (MCO, Works No. 3A) together with associated access and drainage (MCO, Works No. 5A) and landscaping (MCO, Works No. 6A).
  - Alterations to the maximum permitted height of gantry cranes at the rail freight interchange by 4m, to 24m overall;
  - An expansion of the EMG1 Management Suite by the EMG1 site entrance to cater for the additional demand on management facilities resulting from EMG1 (MCO, Works No. 3B);
  - Enhancements to the Public Transport Interchange by way of the installation of EV charging infrastructure for buses and provision of a drop-off layby adjacent to the transport hub (MCO, Works No. 5B and 5C); and

[3] Due to its geographical distance from the other EMG2 works, for the purpose of this report the upgrade to the substation has been reviewed alongside the Highway Works

- Provision of a signalised crossing over the EMG1 exit road approach to the access junction to EMG1 (MCO, Works No. 8A) connecting to the drop-off layby.

1.12 In broad terms, the EMG2 Project is located in the district of North West Leicestershire on land close to East Midlands Airport (EMA). The EMG2 Main Site is situated south of the airport together with land required for associated Highway Works to the east and north of EMA along the M1 corridor. It also includes land to the north of EMA within the existing East Midlands Gateway Logistics Park to accommodate the EMG1 Works.

1.13 An illustrative site location plan is provided as **Figure 1.1**.

Report Purpose

1.14 This report will screen each water body to identify possible effects of the proposed development. Any activities which may have an effect on a water body will be scoped in to identify whether they require a full WFD Assessment including additional mitigation measures.

Assessment Method

1.15 A desk-based study was undertaken for the search of WFD information. The screening area has been defined as WFD receptors within 250 m of the EMG2 Project, which is extended to 2 km for hydrologically connected WFD water bodies. The search area for hydrologically connected WFD water bodies has been set at 2 km as it is unlikely that any impacts from the EMG2 Project (i.e., pollution/construction material ingress) is likely to propagate over 2 km downstream.

1.16 The exception to this approach are the proposed signage alterations on the M1 in the very south of the EMG2 Project, which just encroach into the Grace Dieu Brook Catchment (trib of Black Brook) surface water body. The surface water body itself has been included in the screening for completeness, but given the proposed works are limited to minor signage alterations it is not considered necessary to also review the water bodies downstream of this.

1.17 Background desk study data has been reviewed from the following sources:

- Humber River Basin Management Plan;
- EA's Catchment Data Explorer;
- EA Flood Mapping;
- British Geological Survey (BGS) mapping;
- MAGIC (Multi-Agency Geographic Information for the Countryside)
- Consultation with the EA
- Consultations with Severn Trent Water (STW)
- Consultations with Fairhurst, the project's Geo-Environmental engineers.

1.18 This data was used to:

- Identify WFD water bodies that could be impacted by the EMG2 Project;
- Determine the relevant current ecological, chemical and hydromorphological conditions; and
- Support assessment of the possible impacts that could result from the EMG2 Project.

Environment Agency Consultation

1.19 Revision P01 of the WFD screening was submitted to the EA for their opinion in December 2024. In their response (ref: XA/2025/100260/01-L01) the EA agreed with the overall conclusions and that the reasoning behind screening out a full WFD Assessment was justified. This revision has been prepared to include additional information requested by the EA in their response.

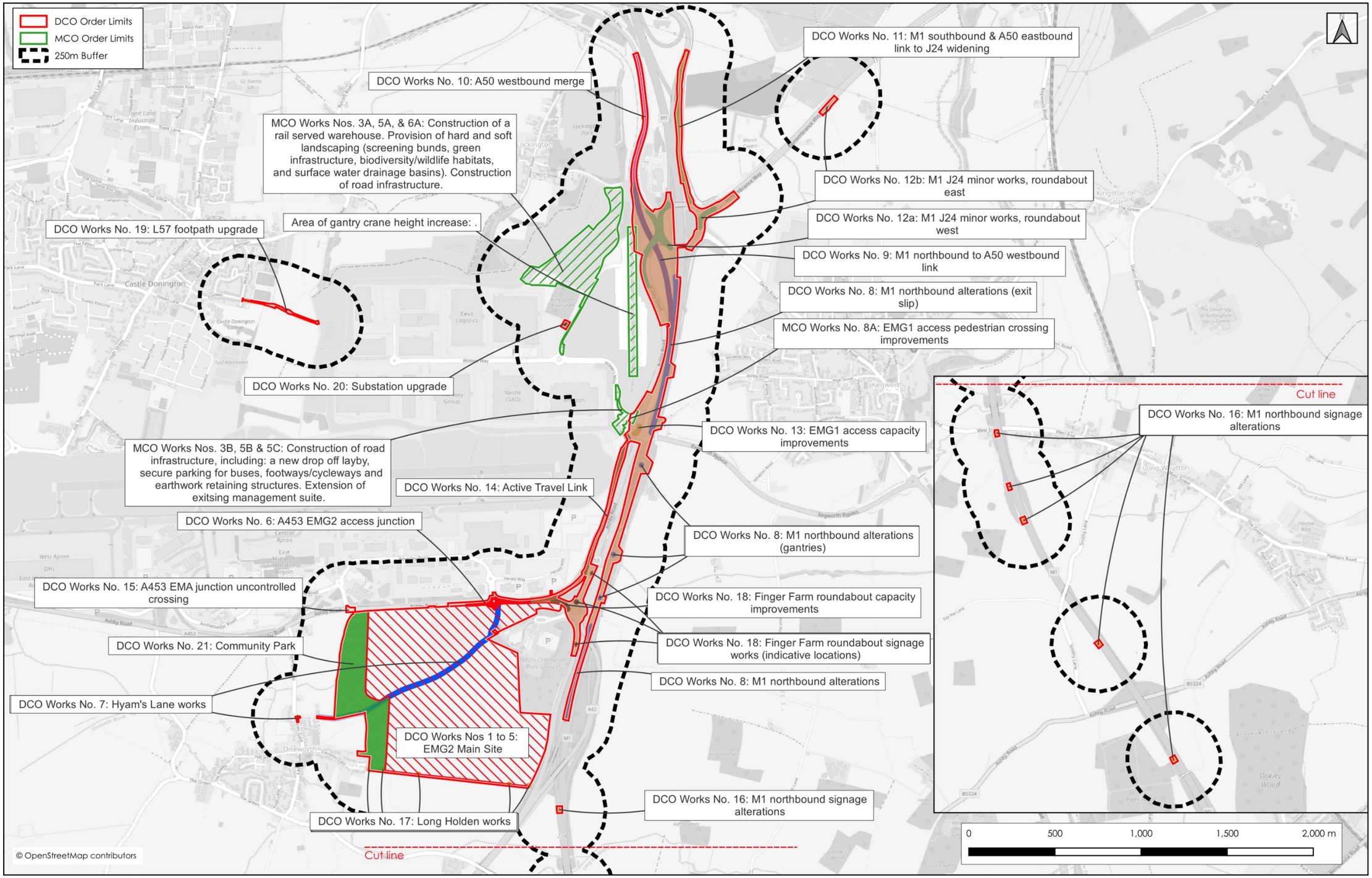

Figure 1.1: Site Location

2. EXISTING CONDITIONS & DEVELOPMENT PROPOSALS

2.1 A description of the existing conditions and the proposed development components is provided within this section. It should be noted that at the time of writing the EMG2 Project is still in the design and assessment stage, so the proposals are subject to change.

EMG2 Works & Local Highway Works

Baseline

2.2 The principal development of the EMG2 Project is located around the EMG2 Works. For the purpose of this report, the upgrade of the EMG1 substation to accommodate EMG2 is grouped in with the Highway Works due to its geographical position.

2.3 The EMG2 Works (excluding the sub-station) are located on agricultural land to the south of Ashby Road (A453), to the east of the village of Diseworth, and to the West of the M1. It falls across two topographical catchments roughly separated by Hyam's Lane, a track which bisects the EMG2 Works diagonally from south-west to north-east. The northern catchment generally falls in a westerly direction towards the Hall Brook, and the southern catchment falls in a southeasterly direction towards the Diseworth Brook.

2.4 The EMG2 Works are located in Flood Zone 1 and outside of the fluvial floodplain, as shown in Leicestershire County Council's integrated catchment model. While there are shown to be surface water flow routes present, these are generally generated from within the site itself.

2.5 A number of ditches are present to the south of Hyam's Lane; these have been observed to be seasonally dry, canalised (artificial channel form/heavily modified) and to not contain any aquatic or riparian ecology of importance. Therefore, they are thought to only act as land drainage features, collecting surface water runoff from the agricultural fields and directing it to the outfall. The ditches direct surface water runoff into a National Highways culvert which runs between the south-eastern corner of the EMG2 Works and the Diseworth Brook. The Brook enters the culvert via a 1.6m drop into a manhole chamber, before flowing within 380m of culvert due south. This significant length of culverting acts as a barrier to aquatic fauna, isolating the ditches from the downstream Diseworth Brook. Therefore, the ditches are not considered to be an ecological asset of the surface water body.

2.6 The site of the EMG2 Works is currently used for arable agriculture. It is subject to seasonal ploughing, cultivation, and treatment with agrichemicals. In a rainfall event, and especially in storm events, sediments and the chemicals (including phosphates) have the potential to be mobilised and washed into the downstream watercourse system.

2.7 Phosphate pollution has been identified by the EA as the most common cause of water quality failures in England. In an EA report[4] agriculture and rural land management is identified as the largest phosphate source and the most common cause of water bodies not achieving good status for phosphate status. Sewage effluent (from sewage

[4] Environment Agency, Phosphorus and Freshwater Eutrophication Pressure Narrative. October 2019

treatment works) is the second largest source, and untreated urban and road runoff is the third most common source.

2.8 BGS mapping shows the site of the EMG2 Works to be underlain predominantly by Gunthorpe Member – Mudstone, with thin bands of Gunthorpe Member – Siltstone, Dolomitic and Diseworth Sandstone. These bedrock layers are designated as Secondary B Aquifers, defined as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

2.9 Superficial deposits of Glaciofluvial Deposits, Mid Pleistocene – Sand and Gravel, Oadby Member – Diamicton and Head – Clay, Sand and Gravel are also mapped. The Glaciofluvial Deposits are designated Secondary A Aquifers, defined as 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. The Oadby Member – Diamicton and Head – Clay, Silt, Sand and Gravel are designated Secondary Undifferentiated assigned in cases where it has not been possible to attribute either category A or B to a rock type.

2.10 The EMG2 Works are not located within a groundwater source protection zone (SPZ), or a drinking water protected area. BGS hydrogeology mapping indicates that the underlying aquifer is 'low productivity'. The groundwater is identified by the EA to be of high to medium-high vulnerability.

2.11 A Factual Ground Investigation Report prepared by Fairhurst in 2022 (ref: 765514-01) has confirmed that the underlying bedrock geology is comprised predominantly of mudstone with siltstone and sandstone horizons. The northern and southern portions of the site encountered shallow rock head with the middle portion of the site experiencing a strip of deeper superficial deposits.

2.12 Soils were found to be uncontaminated and comprise stiff clay beneath a layer of topsoil. Based on the observed conditions, it was anticipated that there would be limited infiltration potential, and this was confirmed through a series of eight soakaway tests. Of the eight tests undertaken two returned a very slow permeability rate of 10^{-6} m/s, while the other six tests did not return an infiltration rate at all. This confirms that the EMG2 Main Site has very limited groundwater recharge potential, and that it predominantly drains through runoff into the local drainage ditches.

2.13 Three groundwater monitoring rounds were completed as part of the ground investigation between the 13th of October 2022 and 14th of November 2022. The results of the monitoring indicate shallow groundwater water (perched and non-continuous within superficial deposits), for example at 1.25 m below ground level (bgl) within the Made Ground and at 3.85 m bgl within the Glaciofluvial Deposits. Deeper groundwater (in the region of 15 m bgl) was recorded within the underlying Secondary B Aquifer supported by the Weathered Gunthorpe and Gunthorpe Member. The deeper groundwater body is generally anticipated to flow in a southerly direction towards the Diseworth Brook, before then following the watercourses' direction to the east towards the River Soar.

Proposed

2.14 The proposed development within the EMG2 Main Site is for a multi-unit logistics/industrial development together with supporting and co-located office functions. The emerging development proposals are as follows:

- The development will primarily comprise logistics facilities (Use Class B8) with a proportion of floorspace capable of being used for general industrial uses (Use Class B2).
- vehicular access from the A453.
- structural landscaping areas and buffers including new and retained landscape features and Sustainable Drainage Systems (SuDS).
- a bus interchange terminal at the site entrance.

2.15 Within the immediate area surrounding the EMG2 Main Site, a number of Highway/Offsite Works are proposed, as follows:

- EMG2 access junction works – providing access to the Main Site off the A453 via a new arm off the Hunter Road roundabout and potentially an additional new roundabout access on the A453 (DCO Works No. 6);
- Foot/cycle path and signage improvements on Hyam's Lane (DCO Works No. 7);
- A pedestrian crossing of the A453 (DCO Works No. 15)
- Connecting Long Holden to a new public right of way in the EMG2 Main Site (DCO Works No. 17);
- The creation of a community park (DCO Works. 21

2.16 The development includes embedded mitigation to manage potential impacts on the water environment; this includes:

- The built development has been offset from the Hall Brook so there will be no adverse loss of floodplain or development within the riparian zone. The development is also well removed from of the Diseworth Brook floodplain.
- The development includes sustainable surface water drainage in the form of SuDS to manage surface water quantity. An outfall to the local watercourses will be maintained, but the surface water runoff from the development will be attenuated to prevent any adverse impacts on downstream flood risk. Excess surface water from the development will be stored within a series of basins and swales, supplemented with below ground storage. These features will be sized to accommodate the 1 in 100-year storm including an allowance for future climate change, thus ensuring that runoff from the development is managed appropriately.
- Additionally, to offer flood relief to the village of Diseworth (which has been historically flooded) the development proposes to redirect all runoff from its drained surfaces to the southern outfall (thus bypassing the village). Therefore, a beneficial impact on flood risk will be provided.
- The sustainable surface water drainage will also manage surface water quality from the development. The cascading basins and swales, in addition to full retention separators and permeable paving, will ensure appropriate levels of treatment are provided in accordance with the pollution hazard indices set out in the SuDS manual

(C753). This treatment, in addition to the reduction in agriculture land use, is expected to result in an improvement in the quality of runoff leaving the EMG2 Main Site.

- The EMG2 Works has a high pollution hazard level (a precautionary assumption). Runoff from the development will receive primary treatment on the plot (within permeable paving and separators) and the SuDS basins and swales will provide secondary/tertiary treatment. A proprietary 'downstream defender' (or similar) will provide a final safeguard to the water quality discharged from the development.
- While the soils have been identified to be cohesive with little to no infiltration, the necessary reprofiling could potentially expose more permeable sub-soils/ geology, which could potentially create a pollution pathway between the SuDS and the groundwater body. Therefore, to isolate the water treatment components from the groundwater body, the SuDS are to be lined to prevent infiltration.
- The SuDS provide an opportunity to promote habitat creation. However, their design will also need to consider the risk of attracting birds, given the proximity of the airport.
- Regular inspection and maintenance of the drainage systems will take place throughout the life span of the EMG2 Works to ensure that they remain in good operational condition and work efficiently. This will include inspection and clearance of the outfall structures to remove any potential blockages.
- Potable water supply for the development will be provided from the existing 12 inch water main within the verge of A453 Ashby Road; it has been confirmed by STW that there is sufficient capacity in the existing network to support the connection.
- Foundation design has not been undertaken at this stage of project. Shallow foundations are unlikely to have any significant impact on the groundwater body(s), but if deeper piled foundations are required then a Foundation Works Risk Assessment (FWRA) will be completed to identify any necessary measures required to mitigate any potential contaminative risks to the groundwater body, in accordance with relevant EA guidance. This is expected to be secured as a requirement in the DCO.

EMG1 Works

Baseline

2.17 EMG1 is a nationally significant infrastructure development comprising a rail freight terminal and warehousing authorised by The East Midlands Gateway Rail Freight Interchange and Highway Order 2016 (SI 2016/17) (the EMG1 Order) which is approaching substantial completion.

2.18 EMG1 is located in the upper catchment of the Hemington Brook and Lockington Brook, and surface water from the development is discharged to both watercourses. The EMG1 development includes drainage infrastructure designed to manage surface water runoff, mimicking the pre-development conditions. Surface water runoff is directed within pipe to a series of basins which provide storage and treatment prior to surface water being discharged from the development. The discharge rate from the development is restricted to the equivalent greenfield annual average runoff rate (QBAR) to mimic the pre-development conditions.

2.19 The drainage infrastructure was designed to manage the 1 in 100-year critical duration storm with a 20% allowance for climate change. Larger events will utilise any additional storage volume available within the basin's freeboard allowance, before overflowing into the downstream watercourses.

2.20 The works proposed as part of the EMG2 Project are located in the drainage catchment outfalling to the Lockington Brook.

2.21 EMG1 is located in Flood Zone 1 and outside of the fluvial floodplain. While EA Risk of Flooding from Surface Water mapping identities a flow route through EMG1, this data pre-dates the construction of EMG1. There are no significant sources of flood risk within EMG1 that the works need to avoid.

2.22 BGS mapping shows EMG1 is predominantly underlain by Edwalton Member – Mudstone in the north, and Tarporley Siltstone Formation in the south. These bedrock layers are designated as Secondary B Aquifers, defined as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

2.23 A small area of Helsby Sandstone Formation is located below the existing EMG1 gantry cranes. This classified as Principal Aquifer, a strategically important rock unit that has high permeability and water storage capacity. However, the proposals in this location are limited to changing the height of the existing gantry cranes; no material change to the existing development is proposed that would affect the surface water or groundwater bodies.

2.24 Superficial deposits of Eagle Moor Sand and Gravel Member (Secondary A Aquifer), Head - Clay, Silt, Sand and Gravel (Secondary (undifferentiated) Aquifer), Egginton Common Sand and Gravel Member (Secondary A Aquifer), and Wanlip Member (Secondary A Aquifer) are also mapped beneath EMG1. Secondary A Aquifers are defined as permeable layers that can support local water supplies, and may form an important source of base flow to rivers.

2.25 EMG1 is not located within a groundwater SPZ, or a drinking water protected area. BGS hydrogeology mapping indicates that the underlaying aquifer is of 'Low productivity'. The groundwater is identified by the EA to be of high to medium-high vulnerability.

2.26 Intrusive ground investigation were undertaken in 2013 by RSK to support the previous DCO for EMG1. This confirmed the presence of Superficial Deposits of Eggington Common Sand and Gravel, Head Deposits as well as Thrussington Member – Diamicton. Bedrock of the Tarpoley Siltstone and Edwalton Member were also encountered.

2.27 The ground investigation included the completion of seven soakaway tests within the Tarporley Siltstone Formation, Edwalton Member and Wanlip Member. These observed an insufficient drop in water level in all cases and thus an infiltration rate, to BRE 365 standard, could not be determined. Therefore, it can be concluded that infiltration rates through these strata are very low. This confirms that the land at EMG1 has very limited groundwater recharge potential, and that it predominantly drains through runoff into the local drainage infrastructure within EMG1.

2.28 Four rounds of groundwater monitoring were completed over a five-week period, between the 16th of October 2013 and 11th of November 2013. The results within the EMG1 Works indicated a groundwater level of between 2.08 m bgl and 7.34 m bgl within the Edwalton Member.

2.29 The RSK Interpretative Report does not suggest a groundwater flow direction. However, from a preliminary review and considering the cohesive nature of the underlying geology it can be assumed that the hydraulic gradient generally follows the topographic gradient, to the north / northeast.

Proposed

2.30 The EMG2 Project includes elements to enhance/ add to the EMG1 development. At this stage it is expected to include the following:

- Provision of an additional warehousing on Plot 16 which lies adjacent to the EMG1 rail freight terminal, with an allowance for internal mezzanine space. The proposals for Plot 16 comprise the construction of 1 or 2 buildings.
- An increase to the maximum permitted height of gantry cranes at the rail freight interchange by 4m.
- An expansion of the EMG1 Management Suite by the EMG1 site entrance to cater for the additional demand on management facilities resulting from the EMG2 Project;
- Enhancements to the Public Transport Interchange by way of the installation of EV charging infrastructure for buses and provision of a drop-off layby adjacent to the transport hub.
- Secure parking for buses

2.31 The development includes embedded mitigation to manage potential impacts on the water environment, this includes:

- The works at EMG1 will fall within the existing EMG1 drainage catchment draining to the Lockington Brook. The EMG1 drainage infrastructure will be enhanced to ensure that the additional impermeable surfaces introduced by the works are provided appropriate surface water storage and treatment facilities.
- The potential impact on downstream water quantity will be managed by restricting the discharge rate to mimic the baseline conditions as far as practicable. This will ensure that downstream flood risk is not adversely affected.
- The drainage enhancements will also include appropriate levels of treatment in accordance with the pollution hazard indices set out in the SuDS manual (C753). This treatment will ensure that the runoff leaving the site is treated sufficiently.
- The works at EMG1 has a high pollution hazard level (a precautionary assumption). Runoff from the development will receive primary treatment on the plot (within permeable paving and separators) and the SuDS basin will provide secondary/tertiary treatment as required.
- While the underlying geology has been proven to have little to no infiltration, there is a risk of new pollution pathways forming between the SuDS and the underlying groundwater. Therefore, as a precaution, the SuDS are to be lined to prevent infiltration.

- The SuDS provide an opportunity to promote habitat creation. However, their design will also need to consider the risk of attracting birds, given the proximity of the airport.
- Regular inspection and maintenance of the drainage systems will take place throughout the life span of the EMG2 Project to ensure that they remain in good operational condition and work efficiently. This will include inspection and clearance of the outfall structures to remove any potential blockages.
- Potable water for the development will be provided from an existing 180mm PE water main within the private access road within EMG1; it has been confirmed that there is sufficient capacity in the network to support the connection.
- Foundation design has not been undertaken at this stage of project. Shallow foundations are unlikely to have any significant impact on the groundwater body(s), but if deeper piled foundations are required then a FWRA will be completed to identify any necessary measures required to mitigate the potential contaminative risks to the groundwater body(s), in accordance with relevant EA guidance.

Highway Works

2.32 A package of highway improvement works is proposed as part of the EMG2 Project including improvements around Junction 24 of the M1 and A50, as well as more minor works on the local highways network and pedestrian/cycle route enhancements. For the purpose of this report, the upgrade of the EMG1 substation to accommodate EMG2 is grouped in with the Highway Works due to its geographical position.

2.33 The works are generally located in Flood Zone 1, with the exception of 'widening of the A50 west bound to the north of the new merge from the link road', 'widening of the link road between the A50 east bound and junction 24 of the M1', and 'M1 J24 minor works' which are shown to encroach into Flood Zone 3 and 2 of the River Trent/Soar. However, a review of the latest EA LiDAR and River Trent and Soar modelled flood levels has shown that the location of the works is located upon embankments raised above the 1 in 1000-year floodplain.

2.34 The highways works are also proposed in locations with a mapped surface water flood risk, according to EA data. However, this data does not fully consider the highway drainage infrastructure already in place, nor the highway improvement works and topographical alterations which were made to the M1, the A50 and the A453 as part of EMG1. Surface water flooding is not considered to pose a significant risk.

2.35 Due to the nature of linear infrastructure the Highway Improvement Works are shown on BGS maps to cross a number of different bedrock geologies:

- Gunthorpe Member – Mudstone (Secondary B Aquifer)
- Gunthorpe Member – Siltstone (Secondary B Aquifer)
- Diseworth Sandstone (Secondary B Aquifer)
- Tarporley Siltstone Formation (Secondary B Aquifer)
- Helsby Sandstone Formation (Principal Aquifer)
- Edwalton Member – Mudstone (Secondary B Aquifer)
- Arden Sandstone Formation (Secondary A Aquifer)

- Branscombe Mudstone Formation (Secondary B Aquifer)

2.36 Similarly, the works also cross a number of superficial deposits:

- Oadby Member – Diamicton (Secondary (undifferentiated) Aquifer)
- Head – Clay, Silt, Sand and Gravel (Secondary (undifferentiated) Aquifer)
- Egginton Common Sand and Gravel Member (Secondary A Aquifer)
- Wanlip Member – Sand and Gravel (Secondary A Aquifer)
- Hemington Member – Silt and Gravel (Secondary A Aquifer)
- Glaciofluvial Deposits – Sand and Gravel (Secondary (undifferentiated) Aquifer)
- Glaciolacustrine Deposits, Mid Pleistocene - Clay, Silt and Sand (Secondary (undifferentiated) Aquifer)
- Alluvium - Clay, Silt, Sand and Gravel (Secondary A Aquifer)

2.37 The highway works are not located within a groundwater SPZ, or a drinking water protected area. BGS hydrogeology mapping indicates that the underlaying aquifer is generally of 'Low productivity', but the works immediately to the south of Junction 24 are over an area mapped as a 'highly productive' aquifer (at the Helsby Sandstone Formation). The groundwater is identified by the EA to be of high to medium-high vulnerability.

2.38 A Preliminary Sources Study Report (PSSR) includes a desktop study and site reconnaissance of the Highway Improvements. This has reported hardstanding and made ground (the existing M1 and A50 highways are located upon embankments), underlain by Merica Mudstone (Clay and Siltstone). Infiltration testing has not been undertaken, but Mercia Mudstone and made ground is indicative of low permeability geology. Given the existing hardstanding, made ground and underlying mudstone, it can be concluded that these areas have very limited infiltration and groundwater recharge potential, and that they predominantly drain through runoff into the local highway drainage infrastructure.

2.39 The emerging development proposals are as follows:

- M1 northbound alteration works – providing gantry/ signage improvements on the M1 (DCO Works No. 8);
- M1 northbound to A50 west bound link works – providing a new off-slip lane from the M1 northbound at J24 to provide a direct link to the A50 westbound, which will cross the A453, and will include A50 westbound alterations (DCO Works No. 9);
- A50 westbound merge - construction of a new merge connecting to the link road from the M1 northbound and widening of the A50 to the north of the new merge from the link road (DCO Works No. 10)
- M1 southbound and A50 eastbound link to Junction 24 widening works – providing widening of the A50 eastbound link at Junction 24 and other related works and traffic management measures in this location (DCO Works No. 11);
- M1 Junction 24 minor alteration works – providing signing and lining amendments on the Junction 24 roundabout (DCO Works No. 12a and b);

- EMG1 access capacity improvement works – providing lane widening at the EMG1 roundabout to increase southbound turning capacity into EMG1 (DCO Works No. 13);
- EMG1 to EMG2 Active Travel Link works – providing a dedicated cycle lane alongside the A453 between EMG1 and the Main Site (DCO Works No. 14);
- M1 northbound signage alterations (DCO Works No. 16);
- Signage improvements at the finger farm roundabout (DCO Works No. 18);
- L57 Footpath upgrade – improvements to an existing footpath to be a shared footway/cycleway, including an upgrade to the existing culverted crossing on the Hemington Brook (DCO Works No. 19); and
- Upgrade of the EMG1 substation to accommodate EMG2 (DCO Works No. 20).

2.40 The development includes embedded mitigation to manage potential impacts on the water environment, at this stage in the design process this is expected to include:

- Any additional surface water runoff generated by the works to the highways will be accommodated in the existing highway drainage through a combination of enhancing the available storage within the current highway basins, and/or by offering additional storage basins or below ground storage at the location of the works.
- The potential impact on downstream water quantity will be managed by restricting the discharge rate to mimic the baseline conditions as far as practicable.
- The potential impact on downstream water quality will be managed by assessing the proposed treatment processes within a Highways Agency Water Risk Assessment Tool (HAWRAT) analysis.
- To isolate the water treatment components from the underlying groundwater any new SuDS are to be lined to prevent infiltration.
- Foundation design has not been undertaken at this stage of project. Shallow foundations are unlikely to have any significant impact on the groundwater body(s), but if deeper piled foundations are required then a FWRA will be completed to identify any necessary measures required to mitigate the potential contaminative risks to the groundwater body(s), in accordance with relevant EA guidance. This is expected to be secured as a requirement in the DCO.

3. WATER BODY INFORMATION

River Humber River Basin Management Plan

3.1 The EMG2 Project is located across three operational surface water bodies, and two ground waterbodies which fall within the River Humber RBMP. The EA Humber RBMP describes the River Basin District, and the pressures that the water environment faces. It shows what this means for the current state of the water environment, and what actions will be taken to address the pressures under the requirements of the WFD.

3.2 The latest version of the Humber RBMP[5], undertaken by Defra and the EA, includes an assessment of river basin characteristics, a review of the impact of human activities, statuses of water bodies and an economic analysis of water use and progress since the first plan was published in 2009.

Surface Water Bodies

3.3 The surface water bodies within the vicinity of the EMG2 Project are illustrated within **Figure 3.1**, with the latest cycle 3 classification summarised in **Table 3.1**.

Long Whatton Brook Catchment (trib of Soar) - GB104028047170

3.4 This is classified by the EA as having an overall poor ecological status. This is due to poor biological quality elements (specifically fish), and physico-chemical quality elements (specifically phosphate pollution).

3.5 The reasons for not achieving good status and reasons for deterioration are identified as:

- Diffuse pollution from riparian and in-river activities associated with agriculture and rural land management
- Diffuse pollution from livestock management associated with agriculture and rural land management (phosphate pollution)
- Physical barriers creating ecological discontinuity
- Point source pollution associated with an abandoned mine
- Diffuse pollution from urban and transport drainage (phosphate pollution)
- Point source pollution from sewage discharge (phosphate pollution)
- Other pollutants, including Polybrominated diphenyl ethers (PBDE) and Mercury and Its Compounds.

3.6 The EA identify that there is a low confidence in achieving the objective of a good ecological status by 2027 as it would be disproportionately expensive.

3.7 The waterbody includes a proportion of the Soar R NVZ (S309) and Burton (G34) Nitrates Directive protected areas.

[5] Humber River Basin District River Basin Management Plan, Defra and Environment Agency (2024)

Hemington Brook Catchment (trib of Soar) - GB104028047410

3.8 This is classified by the EA as having a bad ecological status. This is due to biological quality elements (specifically macrophytes and phytobenthos), and physico-chemical quality elements (specifically dissolved oxygen).

3.9 The reasons for not achieving good status and reasons for deterioration are identified as:

- Diffuse pollution from riparian and in-river activities associated with agriculture and rural land management (dissolved oxygen)
- Natural drought (dissolved oxygen)
- Other pollutants, including Polybrominated diphenyl ethers (PBDE), Perfluorooctane sulphonate (PFOS), and Mercury and Its Compounds.

3.10 Additionally, during the WFD screening consultation the EA also advised that another reason for not achieving a good status is likely to be the density of transport and urban related infrastructure within the catchment, which may contribute to poor water quality.

3.11 The EA identify that there is a low confidence in achieving the objective of good ecological status by 2027 as it would be disproportionately expensive. However, during the WFD screening consultation the EA advised that they are working with the Soar Catchment Partnership to develop projects to help improve the environmental quality of these brooks.

3.12 The waterbody includes a proportion of the Soar R NVZ (S309) Nitrates Directive protected area. It also includes the Lockington Marshes Site of Special Scientific Interest (SSSI) which is located at the downstream extent of the surface water body. This is a SSSI which is reliant on water supply for Willow Carr.

Soar from Long Whatton Brook to Trent - GB104028047212

3.13 This surface water body is located downstream of Long Whatton Brook Catchment (trib of Soar) and Hemington Brook Catchment (trib of Soar).

3.14 This is classified by the EA as having a moderate ecological status. This is due to moderate biological quality elements (specifically macrophytes and phytobenthos), and physico-chemical quality elements (specifically phosphate pollution).

3.15 The reasons for not achieving good status and reasons for deterioration are identified as:

- Diffuse pollution from livestock management associated with agriculture and rural land management (phosphate pollution)
- Point source pollution from sewage discharge (phosphate pollution)
- Physical modifications affecting fish navigation
- Other pollutants, including Polybrominated diphenyl ethers (PBDE) and Mercury and Its Compounds.

3.16 The EA identify that there is a low confidence in achieving the objective of good ecological status by 2027 as it would be disproportionately expensive.

3.17 The waterbody includes the Soar R NVZ (S309), the River Trent from River Soar to Carlton-on-Trent NVZ (S320) and Burton (G34) Nitrates Directive protected areas, as well as the River Soar (UKENRI103) Urban Weste Water Treatment Directive protected area.

Grace Dieu Brook Catchment (trib of Black Brook) - GB104028047090

3.18 This is classified by the EA as having an overall moderate ecological status. This is due to moderate biological quality elements, and bad physico-chemical quality elements (specifically Biochemical Oxygen Demand).

3.19 The reasons for not achieving good status and reasons for deterioration are identified as:

- Diffuse pollution associated with agriculture and rural land management
- Point source pollution from sewage discharge
- Other pollutants, including Polybrominated diphenyl ethers (PBDE) and Mercury and Its Compounds.

3.20 The EA identify that there is a low confidence in achieving the objective of a good ecological status by 2027 as it would be disproportionately expensive.

3.21 The waterbody includes a proportion of the Soar R NVZ (S309) and Burton (G34) Nitrates Directive protected areas.

Downstream Water Bodies

3.22 The Trent from Soar to The Beck Water Body (GB104028053110) is located downstream of the Soar from Long Whatton Brook to Trent. This is located in the region of 3.4km downstream of the proposed EMG2 Project, and so falls outside of the 2km buffer adopted for hydrologically connected WFD water bodies.

3.23 The Black Brook from Grace Dieu Brook to Soar Water Body (GB104028047100) is located downstream of the Grace Dieu Brook Catchment. While this is located within 2km of the EMG2 Project, the works within the upstream water body are limited to minor signage alterations on the M1 that will have no material impact on the waterbody. Therefore, this downstream waterbody has been omitted from the screening report.

Groundwater Bodies

3.24 The groundwater bodies within the vicinity of the EMG2 Project are illustrated within **Figure 3.2**, with the latest cycle 3 classification summarised in **Table 3.2**.

Soar - Secondary Combined Water Body - GB40402G990600

3.25 This is classified by the EA as having a good overall status.

3.26 The water body includes a source protection zone at Melton Mowbray, approximately 30km to the east of the site, and at Coalville 7.5km to the south of the site, both of these are located upstream of the site.

3.27 The water body includes drinking water protected areas 1.3km to the west and 13km to the south-east. These areas are also located upstream of the site.

3.28 The waterbody includes multiple Nitrate Vulnerable Zones which are associated with designated areas at risk from agricultural nitrate pollution.

Soar - PT Sandstone Water Body - GB40401G302800

3.29 This is classified by the EA as having a poor overall status. This is due to the poor chemical condition of the groundwater within a drinking water protected area, and the general chemical condition.

3.30 The reasons for not achieving good status and reasons for deterioration are identified as:

- Diffuse pollution from agriculture and rural land management
  - Poor livestock management, and
  - Poor nutrient management

3.31 The EA identify that there is a low confidence in achieving the objective of a good ecological status by 2027 as it would be disproportionately expensive.

3.32 The water body includes a source protection zone at Coalville 7.5km to the south in disparate region located upstream of the site.

3.33 The water body includes drinking water protected areas 1.3km to the west and 6.6km to the south, in disparate regions located upstream of the site.

3.34 The waterbody includes multiple Nitrate Vulnerable Zones which are associated with designated areas at risk from agricultural nitrate pollution.

Lower Trent Erewash - Secondary Combined Water Body - GB40402G990300

3.35 This is classified by the EA as having a good overall status.

3.36 The water body includes multiple source protection zones within its large coverage. The nearest is at Long Eaton 5.2km to the north of the site and on the far side of the River Trent.

3.37 The water body also includes drinking water protected and safe guarded areas. The nearest is located 1.3km to the west and upstream of the site. The next nearest is located approximately 26km to the north-east at Lowdham.

3.38 The waterbody includes multiple Nitrate Vulnerable Zones within its large coverage which are associated with designated areas at risk from agricultural nitrate pollution.

3.39 The waterbody includes within its coverage Thorne Moor (SAC) and the Humber Estuary (SAC, RAMSAR, SPA). These are located well over 100km downstream of the site.

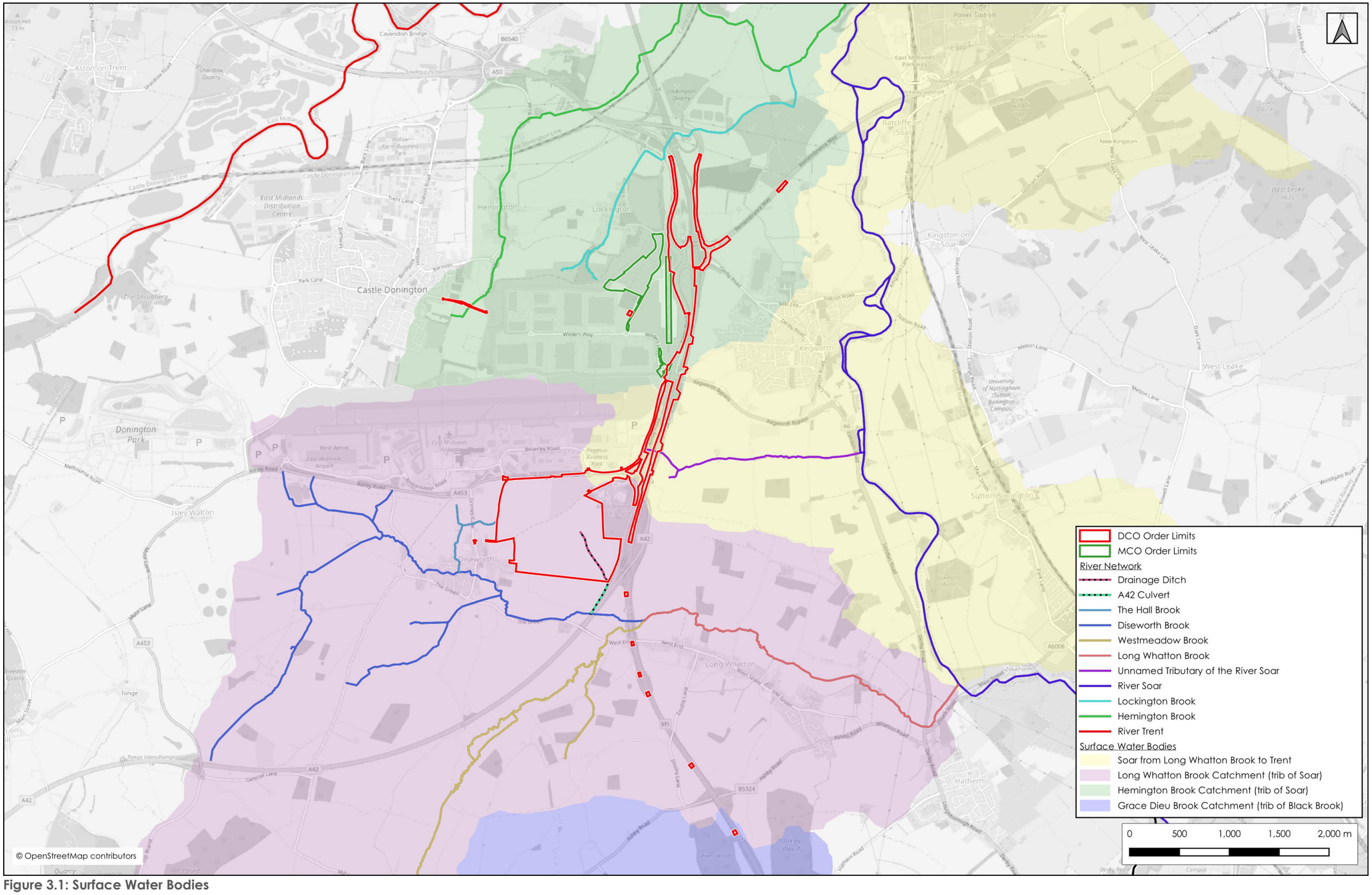

Figure 3.1: Surface Water Bodies

Table 3.1: Surface Water Body Classifications (Cycle 3 2022)

Water Body Name	Water Body ID	Catchment Area (km²)	Length (km)	Hydromorphological Designations	Overall Status	Classifications																	
						Ecological																	Chemical
						Biological quality elements					Phsico-chemical quality elements					Hydromorphological Supporting Elements					Specific pollutants	
						Overall	Fish	Invertebrates	Macrophytes and Phytobenthos	Macrophytes Sub Element	Overall	Ammonia	Biochemical Oxygen Demand	Dissolved oxygen	Phosphate	Temperature	pH	Overall	Hydrological Regime	Morphology		
Long Whatton Brook Catchment (trib of Soar) Water Body	GB104028047170	40.713	15.921	not designated artificial or heavily modified	**Poor**	Poor	Poor	High	Good	Good	Moderate	High	High	High	Poor	High	High	Supports good	Supports good	Supports good	High (zinc)	Not Assessed
Hemington Brook Catchment (trib of the Soar) Water Body	GB104028047410	13.411	7.914	not designated artificial or heavily modified	**Bad**	Bad	-	Moderate	Bad	Bad	Good	High	High	Good	High	High	High	Supports good	Supports good	Supports good	-	Not Assessed
Soar from Long Whatton Brook to Trent Water Body	GB104028047212	22.237	10.509	not designated artificial or heavily modified	**Moderate**	Moderate	High	Good	Moderate	Moderate	High	High	High	High	Poor	High	High	Supports good	Supports good	-	High (Arsenic, Copper, iron, Manganese, Zinc)	Not Assessed
Grace Dieu Brook Catchment (trib of Black Brook)	GB104028047090	2013	9.841	not designated artificial or heavily modified	**Moderate**	Moderate	-	Moderate	Moderate	Moderate	High	Moderate	Bad	High	Moderate	High	High	Not high	Supports good	Not high	High (Copper, Iron, Manganese Triclosan, Zinc)	Not Assessed

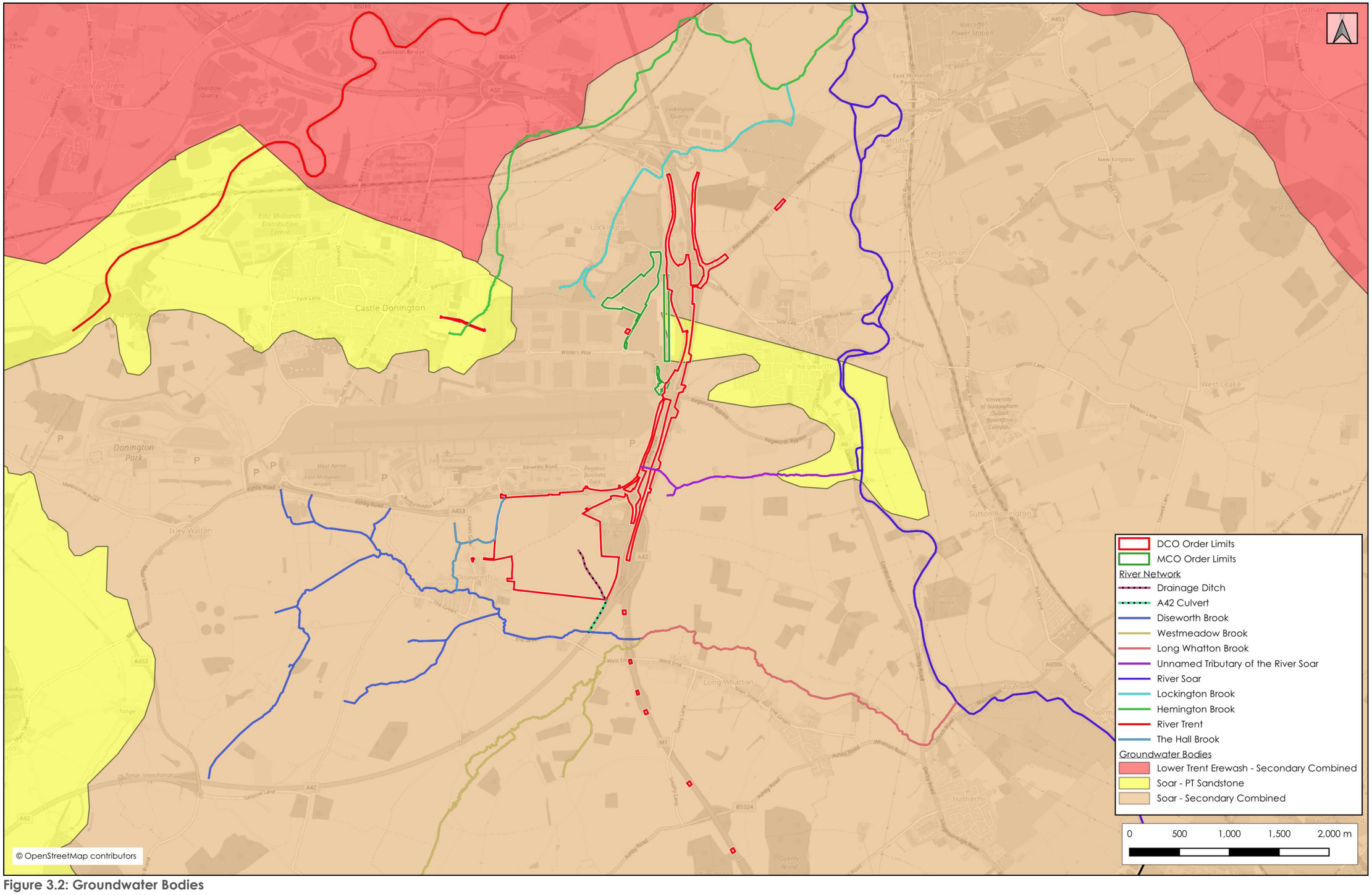

Figure 3.2: Groundwater Bodies

Table 3.2: Ground Water Body Classifications (Cycle 3 2022)

Water Body Name	Water Body ID	Surface area (km²)	Overall Status	Classifications														
				Quantitative						Chemical (GW)							Supporting elements (Groundwater)	
				Overall	Quantitative Status element	Quantitative Dependent Surface Water Body Status	Quantitative GWDTEs test	Quantitative Saline Intrusion	Quantitative Water Balance	Overall	Chemical Status element	Chemical Dependent Surface Water Body Status	Chemical Drinking Water Protected	Chemical GWDTEs test	Chemical Saline Intrusion	General Chemical Test	Prevent and Limit Objective	Trend Assessment
Soar - Secondary Combined Water Body	GB40402G990600	1359.378	**Good**	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Active	No Trend
Soar - PT Sandstone Water Body	GB40401G302800	44.812	**Poor**	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Poor	Good	Good	Poor	Active	No Trend
Lower Trent Erewash - Secondary Combined Water Body	GB40402G990300	1924.402	**Good**	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Active	No Trend

4. WFD SCREENING – OPERATIONAL PHASE

4.1 **Section 4** summarises the WFD screening stage for the proposed completed development. A desktop exercise has been completed to review the proposed development activities. The purpose of which is to identify whether there is potential for an activity to affect each of the identified water bodies. Any activity which has the potential to affect a water body is screened in. The embedded mitigation has been considered in the screening stage.

4.2 Given the distributed nature of the EMG2 Project, the screening assessment has been split into the **EMG2 Works**, **EMG1 Works**, and **Highway Improvements**.

EMG2 Main Site

Table 4.1: WFD Screening - Surface Water Bodies - EMG2 Main Site – Operational Phase

Surface water Body	Potential Impacts on Biological, Physico-chemcial, Specific Pollutants, Hydromorphological, and Chemical Elements							Conclusion
	Changes in Flood Mechanisms	Loss or Alteration of Open Channel	Creation of New Habitats	Habitat Severance	Shading	Changes in Water Quantity	Changes in Water Quality	
Long Whatton Brook Catchment (trib of Soar) - GB104028047170	**Betterment expected** The embedded sustainable surface water drainage will increase the storage of storm water on the site, reducing flood risk to the downstream village of Diseworth. Surface water runoff will be discharged to the Diseworth Brook at the equivalent greenfield QBAR.	**No significant change expected** Development has been offset from the Hall Brook and Diseworth Brook. The development will result in the loss of the on-site land drainage channels/ditches, but these only serve agriculture runoff from the site itself. They have observed to be seasonally dry, canalised, and to not contain any aquatic or riparian ecology of importance. They are also isolated from the downstream surface water body by over 380m of culverting. Therefore, these are not considered to be an ecological asset of the surface water body, and their loss is not expected to affect its WFD designation.	**No significant change expected** The SuDS will be designed to promote biodiversity in accordance with sustainable drainage principles. However, the designs will also need to be sensitive to the proximity of the airport and the risk of attracting birds.	**No significant change expected** The Main Site is already isolated from the downstream Diseworth Brook by a significant length of culverting.	**No significant change expected**	**No significant change expected** To offer improvement to flood risk in Diseworth, the development will alter the drainage catchment to direct the contributing runoff currently outfalling upstream of Diseworth, to outfall downstream of Diseworth instead – thus bypassing the village. This will reduce the surface water runoff entering the Hall Brook from the site during flood/storm conditions – which is considered a betterment. The available ground condition data (cohesive soils with little to no infiltration) suggests that runoff from the site to the Hall Brook predominately occurs during storm events; there does not appear to be a significant contribution from the EMG2 Main Site towards dry weather flow rates in the brook. As the permeability of the underlying geology is already low, the introduction of impermeable surfacing by the EMG2 Project is not expected to have a significant impact on through-flow towards the Brook. Therefore, no significant deterioration in dry weather flow in the watercourse is expected.	**Betterment expected** The development will replace the current agricultural land use on the site, a potential source of suspended solids, and nitrate and phosphate pollution within the surface water body. While the development will introduce potential sources of pollution from trafficked areas, service yards and roads (e.g.: road film, oil, litter, etc.), embedded mitigation is included in the form of sustainable surface water drainage. This will include appropriate levels of treatment to safeguard water quality leaving the site. Regular inspection and maintenance of the drainage systems will take place throughout the life span of the EMG2 Project to ensure that they remain in good operational condition and work efficiently.	**Screened out** The EMG2 Project will not result in a deterioration of the water body status or prevent it from achieving a good status in the future.
Hemington Brook Catchment (trib of Soar) - GB104028047410	**No significant change expected** This component of the EMG2 Project will have no significant interaction with this water body.							
Soar from Long Whatton Brook to Trent - GB104028047212	**No significant change expected** The betterment offered in the upstream surface water body is expected to have dissipated by this point.	**No significant change expected**	**No significant change expected**	**No significant change expected**	**No significant change expected**	**No significant change expected**	**No significant change expected** The betterment offered in the upstream water body is expected to have dissipated by this point.	
Grace Dieu Brook Catchment (trib of Black Brook) - GB104028047090	**No significant change expected** This component of the EMG2 Project will have no significant interaction with this water body.							

Table 4.2: WFD Screening - Groundwater Bodies - EMG 2 Main Site - Operational Phase

Groundwater Body	Potential Impacts on Quantitative and Chemical Elements				Conclusion
	Barrier to Groundwater Flow	Groundwater Control Measures / Abstraction	Altering pathways between surface and Aquifer (Infiltration & groundwater recharge)	Water Quality / Contamination	
Soar - Secondary Combined Water Body	**No significant change expected** The development will include reprofiling of the ground, but due to the elevated location of the site above the local floodplains and the low permeability of the soils and aquifer, the introduction of significant barriers to groundwater flow is not expected. No deterioration in status of is anticipated at the water body scale. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body.	**No significant change expected** At this stage no significant groundwater control measures or abstractions are expected to be required. STW have confirmed that there is sufficient capacity in the existing network to supply the development.	**No significant change expected** The permeability of the underlying geology is low. Infiltration testing has returned very low rates, therefore the current groundwater recharge from the site is not considered to be significant. Therefore, the areas of impermeable surfacing introduced to the EMG2 Main Site by the EMG2 Project are not expected to have a significant impact on infiltration rates. No significant deterioration in the groundwater recharge rate is expected. While the soils have been identified to be cohesive with little to no infiltration, the reprofiling of the EMG2 Main Site could potentially expose more permeable sub-soils/ geology creating a potential pollution pathway between the SuDS and the groundwater. Therefore, to isolate the water treatment components from the underlying groundwater, the SuDS are to be lined to prevent infiltration. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body. No deterioration in status is anticipated at the water body scale.	**Betterment expected** The development will replace the current agricultural land use on the site, a potential source of nitrate and phosphate pollution within the groundwater body. While the development will introduce new trafficked areas, service yards and roads, embedded mitigation is included in the form of sustainable surface water drainage. This will include appropriate levels of treatment to safeguard water quality leaving the site. The SuDS will be lined to prevent pollutants filtered out by the SuDS from entering the groundwater body. Regular inspection and maintenance of the drainage systems will take place throughout the life span of the EMG2 Project to ensure that they remain in good operational condition and work efficiently.	**Screened out** The EMG2 Project will not result in a deterioration of the water body status.
Soar - PT Sandstone Water Body	**No significant change expected** This component of the EMG2 Project is removed from this water body.	**No significant change expected** This component of the EMG2 Project is removed from this water body.	**No significant change expected** This component of the EMG2 Project is removed from this water body.	**No significant change expected** The betterment offered in the upstream water body is expected to have dissipated by this point.	**Screened out** The EMG2 Project will not result in a deterioration of the water body status.
Lower Trent Erewash - Secondary Combined Water Body	**No significant change expected** This component of the EMG2 Project is removed from this water body.	**No significant change expected** This component of the EMG2 Project is removed from this water body.	**No significant change expected** This component of the EMG2 Project is removed from this water body.	**No significant change expected** The betterment offered in the upstream water body is expected to have dissipated by this point.	**Screened out** The EMG2 Project will not result in a deterioration of the water body status.

EMG1 Works

Table 4.3: WFD Screening - Surface Water Bodies - EMG1 Works - Operational Phase

Surface water Body	Potential Impacts on Biological, Physico-chemcial, Specific Pollutants, Hydromorphological, and Chemical Elements							Conclusion
	Changes in Flood Mechanisms	Loss or Alteration of Open Channel	Creation of New Habitats	Habitat Severance	Shading	Changes in Water Quantity	Changes in Water Quality	
Long Whatton Brook Catchment (trib of Soar) Water Body	**No significant change expected** This component of the Project will have no significant interaction with this water body.							**Screened out** The Project will not result in a deterioration of the water body status or prevent it from achieving a good status in the future.
Hemington Brook Catchment (trib of Soar) - GB104028047410	**No significant change expected** The Project at EMG1 is well removed from the Hemington and Lockington Brook floodplain. The Project at EMG1 is located within the EMG1 development's drainage catchment. While the Project will introduce new impermeable surfaces to the catchment, subject to the required enhancements to the EMG1 drainage infrastructure (embedded mitigation), there is not expected to be any changes to flood mechanisms in the water body.	**No significant change expected**	**No significant change expected** The SuDS will be designed to promote biodiversity in accordance with sustainable drainage principles. However, the designs will also need to be sensitive to the proximity of the airport and the risk of attracting birds.	**No significant change expected**	**No significant change expected**	**No significant change expected** The Project at EMG1 is located within the EMG1 development's drainage catchment. While the Project will introduce new impermeable surfaces to the catchment, subject to the required enhancements to the EMG1 drainage infrastructure (embedded mitigation), there is not expected to be any changes to surface water discharge into the Lockington Brook.	**No significant change expected** While the development will introduce new trafficked areas and service yards to EMG1, embedded mitigation is included in the form of sustainable surface water drainage. This will include appropriate levels of treatment to safeguard water quality leaving the site. Regular inspection and maintenance of the drainage systems will take place throughout the life span of the Project to ensure that they remain in good operational condition and work efficiently.	**Screened out** The Project will not result in a deterioration of the water body status or prevent it from achieving a good status in the future.
Soar from Long Whatton Brook to Trent - GB104028047212	**No significant change expected** This component of the Project will have no significant interaction with this water body.							**Screened out** The Project will not result in a deterioration of the water body status or prevent it from achieving a good status in the future.
Grace Dieu Brook Catchment (trib of Black Brook) - GB104028047090	**No significant change expected** This component of the Project will have no significant interaction with this water body.							**Screened out** The Project will not result in a deterioration of the water body status or prevent it from achieving a good status in the future.

Table 4.4: WFD Screening - Groundwater Bodies - EMG1 Works - Operational Phase

Groundwater Body	Potential Impacts on Quantitative and Chemical Elements				Conclusion
	Barrier to Groundwater Flow	Groundwater Control Measures / Abstraction	Altering pathways between surface and Aquifer (Infiltration & groundwater recharge)	Water Quality / Contamination	
Soar - Secondary Combined Water Body	**No significant change expected** The development will include reprofiling of the ground, but due to the elevated location of the site above the local floodplains and the low permeability of the soils and aquifer, the introduction of significant barriers to groundwater flow is not expected. No deterioration in status of is anticipated at the water body scale. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body.	**No significant change expected** At this stage no significant groundwater control measures or abstractions are expected to be required at the operational stage. STW have confirmed that there is sufficient capacity in the existing network to supply the development.	**No significant change expected** The permeability of the underlying geology is low. Infiltration testing has returned very low rates, therefore the current groundwater recharge from the site is not considered to be significant. Therefore, the areas of impermeable surfacing introduced to the site by the Project are not expected to have a significant impact on infiltration rates. No significant deterioration in the groundwater recharge rate is expected. While the geology offers little to no infiltration, the localised reprofiling could potentially expose more permeable sub-soils/ geology creating a potential pollution pathway between the SuDS and the groundwater. Therefore, to isolate the water treatment components from the underlying groundwater the SuDS are to be lined to prevent infiltration. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body. No deterioration in status is anticipated at the water body scale.	**No significant change expected** While the development will introduce new trafficked areas and service yards to EMG1, embedded mitigation is included in the form of sustainable surface water drainage. This will include appropriate levels of treatment to safeguard water quality leaving the site. The SuDS will be lined to prevent pollutants filtered out by the SuDS from entering the groundwater body. Regular inspection and maintenance of the drainage systems will take place throughout the life span of the Project to ensure that they remain in good operational condition and work efficiently.	**Screened out** The Project will not result in a deterioration of the water body status.
Soar - PT Sandstone Water Body	**No significant change expected** No material changes to the existing EMG1 development, other than a change in the gantry crane heights, is proposed in this location.				**Screened out** The Project will not result in a deterioration of the water body status.
Lower Trent Erewash - Secondary Combined Water Body	**No significant change expected** This component of the Project is removed from this water body.				**Screened out** The Project will not result in a deterioration of the water body status.

Highway Works

Table 4.5: WFD Screening - Surface Water Bodies - Highway Works - Operational Phase

Surface water Body	Potential Impacts on Biological, Physico-chemcial, Specific Pollutants, Hydromorphological, and Chemical Elements							Conclusion
	Changes in Flood Mechanisms	Loss or Alteration of Open Channel	Creation of New Habitats	Habitat Severance	Shading	Changes in Water Quantity	Changes in Water Quality	
Long Whatton Brook Catchment (trib of Soar) Water Body	**No significant change expected** The highway works are generally located outside of and/or above the floodplain within this water body.	**No significant change expected** The highway works are generally located away from the watercourses in this waterbody.	**No significant change expected**	**No significant change expected** The highway works are generally located away from the watercourses in this waterbody.	**No significant change expected** The highway works are generally located away from the watercourses in this waterbody.	**No significant change expected** The Highway Works will introduce new impermeable surfaces to the catchment. However, subject to the required enhancements to the existing highway drainage infrastructure there is not expected to be any significant changes to the surface water quantity discharged into the surface water bodies.	**No significant change expected** While the development will introduce new trafficked areas, embedded mitigation is included in the form of sustainable surface water drainage. This will include appropriate levels of treatment to safeguard water quality leaving the site.	**Screened out** The EMG2 Project will not result in a deterioration of the water body status or prevent it from achieving a good status in the future.
Hemington Brook Catchment (trib of Soar) - GB104028047410	**No significant change expected** The highway works are generally located outside of and/or above the floodplain within this water body. The upgrade to the L57 footpath will include an upgrade to the existing culvert crossing of the Hemington Brook, but this will include replacing it with a larger diameter culvert and so will represent an improvement as the footpath will be less likely to flood. As the proposed footpath upgrade is associated with replacing an existing smaller culvert, no deterioration in status is anticipated at the water body scale.			**No significant change expected** The highway works are generally located away from the watercourses in this waterbody. As the proposed L57 footpath upgrade is associated with replacing an existing smaller culvert, no deterioration in status is anticipated at the water body scale.				
Soar from Long Whatton Brook to Trent - GB104028047212	**No significant change expected** The highway works are generally located outside of and/or above the floodplain. However, the Active Travel Link could require a new crossing of an unnamed minor tributary of the River Soar. However, it expected that the footpath improvements will be undertaken at grade, and any required crossing of the channel will be made with an appropriate culvert to convey design flows. Therefore, the footpath improvements are not expected to result in a significant loss of floodplain or interruption of flow routes. The new crossing of the unnamed minor tributary of the River Soar would occur immediately upstream of the A453 and M1 culverts (both of which are in the region of 80m in length). Therefore, the relatively minor width of the footpath (approximately 3m) is not considered to represent a significant loss of open channel. No deterioration in status of is anticipated at the water body scale.			**No significant change expected** The new crossing of the unnamed minor tributary of the River Soar would occur immediately upstream of the A453 and M1 culverts (both of which are in the region of 80m in length). Therefore, the relatively minor width of the footpath (approximately 3m) is not considered to represent a significant barrier between habitats No deterioration in status of is anticipated at the water body scale.				
Grace Dieu Brook Catchment (trib of Black Brook) - GB104028047090	**No significant change expected** The highway works within this waterbody are limited to signage alterations, located away from the watercourses.							

Table 4.6: WFD Screening - Groundwater Bodies - Highway Works - Operational Phase

Groundwater Body	Potential Impacts on Quantitative and Chemical Elements				Conclusion
	Barrier to Groundwater Flow	Groundwater Control Measures / Abstraction	Altering pathways between surface and Aquifer (Infiltration & groundwater recharge)	Water Quality / Contamination	
Soar - Secondary Combined Water Body	**No significant change expected** The Highway Works may require reprofiling of the ground and but due to the elevated location of the site above the local floodplains and the low permeability of the soils and aquifer, the introduction of significant barriers to groundwater flow is not expected. No deterioration in status of is anticipated at the water body scale. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body.	**No significant change expected** At this stage no significant groundwater control measures or abstractions are expected to be required.	**No significant change expected** The permeability of the underlying soils and geology is expected to be low, therefore the current groundwater recharge from the area is not considered to be significant. The additional areas of impermeable surfacing introduced by the Highway Improvements are not expected to have a significant impact on infiltration rates. No significant deterioration in the groundwater recharge rate is expected. The permeability of the underlying geology is expected to be low. Therefore, the additional impermeable surfacing introduced by the Highway Improvements are not expected to have a significant impact on any pathways in to the underlying groundwater bodies. However, where new SuDS are required, they will be lined to prevent infiltration and isolate the water treatment components from the groundwater body as a precaution. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body. No deterioration in status of is anticipated at the water body scale.	**No significant change expected** While the development will introduce new trafficked areas, embedded mitigation is included in the form of surface water drainage measures. This will include appropriate levels of treatment to safeguard water quality leaving the site. Where new SuDS are required, they will be lined to prevent pollutants filtered out by the SuDS from entering the groundwater body.	**Screened out** The EMG2 Project will not result in a deterioration of the water body status.
Soar - PT Sandstone Water Body	**No significant change expected** This proposed Highway Works within this waterbody are generally limited to enhancements of existing infrastructure Junction 24 of the M1. No major alterations that could create a barrier to groundwater flow are expected. No deterioration in status of is anticipated at the water body scale. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body.		**No significant change expected** The EMG2 Project's interaction with this groundwater body is limited to enhancements to existing the existing public footpath (L57) and the highway infrastructure at Junction 24 of the M1. Therefore, while the Highway Improvements will result in a relatively minor increase in impermeable areas, any change to the groundwater recharge rate would be negligible at the scale of the groundwater body. Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body. To prevent potential new pollution pathways from being created, where new SuDS are required, they will be lined to prevent infiltration and isolate the water treatment components from the groundwater body.		**Screened out** The EMG2 Project will not result in a deterioration of the water body status.
Lower Trent Erewash - Secondary Combined Water Body	**No significant change expected** This component of the EMG2 Project EMG2 Project is removed from this water body.				**Screened out** The EMG2 Project will not result in a deterioration of the water body status.

5. WFD SCREENING – CONSTRUCTION PHASE

5.1 **Section 5** summarises the WFD screening stage for the construction phase of the EMG2 Project. A desktop exercise has been completed to review the proposed construction activities. The purpose of which is to identify whether there is potential for an activity to affect each of the identified water bodies. Any activity which has the potential to affect a water body is screened in.

5.2 The mitigation from the emerging draft Construction Environmental Management Plan (CEMP) has been considered in the screening stage, as detailed below:

- All construction activities will be undertaken by a competent contractor in accordance with the Construction Environmental Management Plan (CEMP).
- During the construction phase, all site works will be undertaken in accordance with CIRIA 532 (2001) Control of Water Pollution from Construction sites which promotes environmental good practice for control of water pollution arising from construction activities.
- Any works undertaken near a watercourse will be undertaken in accordance with Pollution Prevention Guidance 5 (PPG5), in the absence of any more recent guidance documents from the EA.
- The CEMP will include surface water and silt management plans to provide treatment to surface water runoff from the sites prior to it being discharged.
- Surface water management measures will be included to prevent an increase in runoff and subsequently increased flood risk to downstream receptors. This includes designated pathways for large vehicles to limit the areas of sediment compaction, and the implementation of temporary attenuated storage measures which will ensure surface water runoff is intercepted, safely stored, and discharged from the construction sites at a rate no greater than existing.
- A Soil Management Plan will ensure topsoils and subsoils are stripped, moved, stockpiled, monitored, and respread in a manner that minimises erosion and entrainment.
- The surface of stockpiles of soil and large areas of bare ground will be appropriately covered or treated through the use of methods such as hydroseeding or similar, to help secure sediments and reduce the risk of them being mobilised during a storm event. Steep slopes and bare earth will include appropriate drainage to intercept runoff and limit the propagation of overland flows routes which could otherwise cause erosion and mobilise sediments.
- Treatment facilities such basins, swales, and storm fencing, will be used capture and remove pollutants and suspended sediments prior to runoff leaving the construction sites. In preliminary consultations, the EA identified that the typical suspended solid limit of 40 mg/l would likely apply when discharging surface water. The minimum standard will be confirmed at the permitting stage and factored into the detailed design of the construction phase surface water treatment facilities.
- Temporary ponds or above ground containment will be provided on each plot to remove the bulk of the sediment and pollution load. Surface water runoff will then pass through secondary or tertiary treatment, as necessary to achieve the require quality, before being discharged. In the event that permeable soils or geology are encountered during excavations/ reprofiling, then the SuDS basins and swales will be lined to prevent the formation of pollution pathways into the ground.

- Where the suspended solids are particularly fine, flocculants may be used to help maximise removal. This may constitute a water discharge activity and therefore an environmental permit may be required. The permit requirements will be discussed and confirmed with the EA at the appropriate time.
- Temporary surface water conveyance routes, ditches, swales, and basins will be lined as necessary to minimise erosion and the mobilisation of sediments.
- Existing outfalls from the construction sites, including land drainage, that do not form part of the drainage strategy will be stopped up to prevent treatment measures from being bypassed.
- A penstock will be provided on the outfalls so that the discharge into the receiving watercourse or drainage system can be stopped in the event of a pollution incident.
- Wheel washing facilities and regular sweeping will be undertaken to prevent the build-up of dust and silt on roads. Wheel washing facilities will be located in a designated bunded impermeable area a minimum of 10m from any surface water bodies. Any surplus water from these facilities will be disposed of via the foul water system or treated adequately prior to discharge from the EMG2 Project.
- Concrete will be mixed off site where possible. Where this is not possible, waste water from concrete production and lorry washing will be limited to a designated bunded impermeable area to prevent runoff or infiltration. Wastewater will be directed to the foul water network or adequately treated prior to disposal.
- To avoid the pollution of watercourses from vehicles or accidental spillage, vehicles used on the site will undergo regular inspection and maintained to reduce the risk of leakages. Vehicle washing areas will be located at least 10m from any surface water bodies in designated bunded impermeable areas. Any runoff from this area will be treated prior to discharge.
- On-site refuelling will be undertaken in a designated bunded impermeable area to prevent runoff/infiltration. The EA Pollution Prevention Guidance, while revoked, provides useful information regarding best practices for refuelling, including frequent testing and maintenance of storage tanks.
- Oil and fuel storage facilities will be located in appropriate above ground storage tanks. Drip trays are to be used under vehicles, where appropriate to ensure that oil is collected to prevent contaminated runoff.
- Regular monitoring of the downstream water quality will be undertaken during the construction phase to ensure that the sediment and pollution control measures are working effectively.

Table 5.1: WFD Screening - Surface Water Bodies – All Activities – Construction Phase

Surface water Body	Potential Impacts on Biological, Physico-chemcial, Specific Pollutants, Hydromorphological, and Chemical Elements				Conclusion
	Changes in Flood Mechanisms	Loss or Alteration of Open Channel	Changes in Water Quantity	Changes in Water Quality	
Long Whatton Brook Catchment (trib of Soar) Water Body	**No significant change expected** As per the operational phase, the construction phase will largely occur away from the local watercourses and the floodplain. Where construction works are required in proximity to a watercourse (such as the L57 footpath at the Hemington Brook, and the active travel link over the minor tributary of the River Soar), then the works will be undertaken in line with PPG5, CIRIA 532, and the CEMP.		**No significant change expected** The CEMP will include surface water management measures to prevent an increase in runoff and subsequently increased flood risk to downstream receptors. This will include implementation of temporary attenuated storage measures which will ensure surface water runoff is intercepted, safely stored, and discharged from the construction sites at a rate no greater than existing.	**No significant change expected** The CEMP will include surface water and silt management plans to provide treatment to surface water runoff from the sites prior to it being discharged. Regular monitoring of the downstream water quality will be undertaken during the construction phase to ensure that the sediment and pollution control measures are working effectively	**Screened out** The EMG2 Project will not result in a deterioration of the water body status or prevent it from achieving a good status in the future.
Hemington Brook Catchment (trib of Soar) - GB104028047410					
Soar from Long Whatton Brook to Trent - GB104028047212					
Grace Dieu Brook Catchment (trib of Black Brook) - GB104028047090					

Table 5.2: WFD Screening - Groundwater Bodies – All Activities – Construction Phase

Groundwater Body	Potential Impacts on Quantitative and Chemical Elements			Conclusion
	Groundwater Control Measures / Abstraction	Altering pathways between surface and Aquifer (Infiltration & groundwater recharge)	Water Quality / Contamination	
Soar - Secondary Combined Water Body	**No significant change expected** Some relatively minor local dewatering may be required at the construction stage in any shallow perched groundwater that may be encountered, but providing appropriate permits are secured and best practise followed then, no deterioration in status of is anticipated at the water body scale.	**No significant change expected** The permeability of the underlying geology is generally low to very low, therefore no significant deterioration in the groundwater recharge rate is expected for the limited duration of the construction phase. The CEMP will implement mitigation to help prevent the formation of pollution pathways into the groundwater body for the limited duration of the construction phase. No deterioration in status of is anticipated at the water body scale.	**No significant change expected** The CEMP will implement mitigation to help prevent the formation of pollution pathways into the groundwater body for the limited duration of the construction phase.	**Screened out** The EMG2 Project will not result in a deterioration of the water body status.
Soar - PT Sandstone Water Body				**Screened out** The EMG2 Project will not result in a deterioration of the water body status.
Lower Trent Erewash - Secondary Combined Water Body				**Screened out** The EMG2 Project will not result in a deterioration of the water body status.

6. CONCLUSIONS

6.1 This Water Framework Directive (WFD) Screening report has been produced on behalf of SEGRO (Properties) Ltd in respect of the proposed second phase of development at East Midlands Gateway (EMG2).

6.2 The following points, derived from the WFD Environmental Objectives, were identified to determine whether the proposed development supports the overarching objectives of the WFD:

- The proposed development will not cause deterioration in the status of the water body.
- The proposed development will not compromise the ability of the water body to achieve its WFD status objectives.
- The proposed development will contribute to the delivery of the WFD status objectives of the water body.

6.3 Firstly, the proposed development will incorporate mitigation to ensure that the status of the surface and groundwater bodies are not affected.

6.4 Secondly, the proposed built development will not compromise the ability of the water body to achieve its objectives.

6.5 Finally, while the proposed development will introduce potential new sources of pollution from trafficked areas, service yards and roads, embedded mitigation is included in the form of sustainable surface water drainage. These will include appropriate levels of treatment to safeguard water quality. This will replace the existing agricultural use (which may be contributing to diffuse phosphate and nitrate pollution within the water bodies), thus contributing to the delivery of the WFD status objectives of the surface and groundwater bodies.

6.6 This conclusion has been reached assuming the following embedded mitigation will be implemented:

- Sequential Layout of the EMG2 Project to avoid the floodplain and watercourses wherever possible.
- Where a crossing of a watercourse is required (a new footpath crossing) the culvert will be sized to convey predicted design flood flows.
- The EMG2 Project will include sustainable drainage to manage the quantity and quality of runoff from the development to the receiving water body. Appropriate levels of treatment will be provided in accordance with the pollution hazard indices set out in the SuDS manual (C753) or as identified in HAWRAT analysis.
- Depending on the foundation solution, a FWRA will be completed to identify any necessary measures required to mitigate the potential impacts to the groundwater body.
- The construction will be completed by a competent contractor adhering to the requirements set out within a comprehensive CEMP.