

# **M3 Junction 9 Improvement**

**Scheme Number: TR010055**

## **6.1 Environmental Statement Chapter 4 Environmental Impact Assessment Methodology**

**APFP Regulations 5(2)(a)**

**Planning Act 2008**

**Infrastructure Planning (Applications: Prescribed Forms and  
Procedure) Regulations 2009**

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### Planning Act 2008

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## **6.1 ENVIRONMENTAL STATEMENT - CHAPTER 4: ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY**

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- Appendix 4.1: Major Events Screening Assessment
- Appendix 4.2: Scoping Comments and Responses

## 4 Environmental Assessment Methodology

### 4.1 Introduction

- 4.1.1 This chapter of the Environmental Statement (ES) details the approach taken to the Environmental Impact Assessment (EIA) of the Scheme.
- 4.1.2 The adopted scope, approach and method for assessment for each topic are outlined in the topic specific chapters (**Chapters 5-15 of the ES (Document Reference 6.1)**), with further details such as survey methodology provided.
- 4.1.3 The Scheme is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 (PA 2008). Therefore, the EIA has been carried out in accordance with the Infrastructure Planning (EIA) Regulations 2017 (as amended) (the EIA Regulations), as well the Design Manual for Roads and Bridges (DMRB).

### 4.2 Environmental scoping

- 4.2.1 Planning Inspectorate Advice Note 7 (EIA: Preliminary Environmental Information, Screening and Scoping) (Planning Inspectorate, 2020) identifies an effective scoping process as one which enables the refinement of the assessment and ultimately the information required to form the ES, allowing early identification of likely significant effects and also to agree where aspects and matters can be scoped out from further assessment. In order to justifiably scope out aspects from assessments, the following questions should be addressed:
- Is there an impact pathway from the Proposed Development to the aspect/matter?
  - Is the aspect/matter sensitive to the impact concerned?
  - Is the impact likely to be on a scale that may result in significant effects to the aspect/matter?
  - Could the impact contribute cumulatively with other impacts to result in significant effects to the aspect/ matter?
  - Is there a method of avoidance or mitigation that would reduce the impact on the aspect/matter to a level where significant effects would not occur?
  - Is there sufficient confidence in the avoidance or mitigation method in terms of deliverability and efficacy to support the request?
  - Is there empirical evidence available to support the request?
  - Do relevant statutory consultees agree with the request?

- Have you had regard to (a) relevant National Policy Statement(s) (NPS) and specifically any requirement stated in the NPS(s) in respect of the assessment of this aspect/matter?

4.2.2 An EIA Scoping Report was submitted by National Highways to the Secretary of State in January 2019, who adopted a Scoping Opinion in March 2019. As explained in **Chapter 3 (Assessment of Alternatives)** of the **ES (Document Reference 6.1)**, comments received through the 2019 statutory consultation process showed that whilst there was a high level of support for the Scheme, one concern raised was in relation to the weaving length for vehicles joining the A34 from junction 9 and then heading towards Kings Worthy. Subsequently, National Highways undertook to amend the design as consulted upon, to seek to resolve the identified issues.

4.2.3 Through design refinements, it was identified that there were potentially material changes when compared to the proposed scheme as considered in the original 2019 EIA scoping process. The DMRB LA 103 (Highways England, 2020) states:

***“Scoping shall be repeated where there are material changes:***

***1. In physical characteristics and/or location of the project;***

***2. In the environmental assessment assumptions; and***

***3. In the level of understanding of the current state of the environment (baseline scenario).”***

4.2.4 National Highways therefore determined that a new scoping exercise was required for the Scheme and accordingly, a request for a second Scoping Opinion, superseding the previous scoping process was submitted by National Highways to the Secretary of State in October 2020.

4.2.5 A second Scoping Opinion was received from the Secretary of State in November 2020. **Appendix 4.2 (Scoping Comments and Responses)** of the **ES (Document Reference 6.3)**, demonstrates how due consideration has been given to the Scoping Opinion. **Appendix K.1 (Section 42 Statutory Consultation Comments and the Applicant’s Responses)** of the **Consultation Report (Document Reference 5.1)** outlines how environmental comments received during the 2021 statutory consultation have been considered.

### **Scope of assessment**

4.2.6 The second Scoping Opinion identified and agreed elements / matters to be scoped in and scoped out of the assessment. Regulation 14(3) of the EIA Regulations require the ES to be based on the most recent Scoping Opinion adopted. The following section summarises the outcome of the second scoping process.

### *Scoped in*

4.2.7 The environmental assessment considers the following environmental factors in accordance with Schedule 4 of the EIA Regulations:

- Air Quality
- Cultural Heritage
- Landscape and visual
- Biodiversity
- Geology and soils
- Material assets and waste
- Noise and vibration
- Population and human health
- Road drainage the water environment
- Climate

4.2.8 This ES also considers the vulnerability of the Scheme to major accidents or disasters (within the appropriate ES Chapters), see **Section 4.8** for further information.

### *Scoped out*

4.2.9 The EIA Regulations require the emission of heat and radiation to be considered. The Scheme is a highways scheme and therefore is not anticipated to be a source of significant heat or radiation during construction or operation. The Secretary of State agreed to scope consideration of heat and radiation out on this basis.

4.2.10 Regulation 32 of the EIA Regulations also requires the consideration of any likely significant effects on the environment of another European Economic Area State.

4.2.11 Whilst the Applicant's Scoping Report sought to scope this matter out, concluding that significant effects on another European Economic Area (EEA) State would not be likely, the Scoping Opinion recommended that, for the avoidance of doubt, the ES detail any such consideration and assessment.

4.2.12 In March 2021, the Planning Inspectorate re-considered the likelihood of transboundary effects and considered that the Scheme would be unlikely to have a significant effect either alone or cumulatively on the environment in any European Economic Area State.

4.2.13 No further consideration has therefore been given to transboundary effects and is therefore not reported further in this ES.

4.2.14 The Planning Inspectorate notes that the Scheme is not anticipated to be decommissioned as it would likely have become an integral part of the national infrastructure. However, the Planning Inspectorate recommended that the ES should include an assessment of any decommissioning works required for temporary elements. Whilst the EIA Regulations do not specifically reference decommissioning of a project, any decommissioning of temporary elements of the Scheme has been assessed in the construction phase assessment within **Chapters 5-14 of the ES (Document Reference 6.1)**.

### 4.3 Surveys and predictive techniques and methods

#### Requirements of DMRB

4.3.1 All aspects of the development, environmental assessment and design requirements of motorways and all-purpose trunk road projects are governed by standards set out in the DMRB.

4.3.2 All EIA work and environmental reporting on the Scheme has (unless otherwise stated) been undertaken in accordance with the standards set out in DMRB, including the following:

- DMRB LA 101 Introduction to Environmental Assessment (Highways England, 2019)
- DMRB LA 102 Screening projects for Environmental Impact Assessment (Highways England, 2019)
- DMRB LA 103 Scoping projects for Environmental Assessment (Highways England, 2020)
- DMRB LA 104 Environmental Assessment and Monitoring (Highways England, 2020)

#### Application boundary and study area

4.3.3 The Application Boundary is based on the land anticipated to be required temporarily and/or permanently for the construction, operation and maintenance of the Scheme. **The Land Plans (Document Reference 2.2)**, illustrate temporary and/or permanent acquisition of land and/or rights as part of the Development Consent Order (DCO) Application.

4.3.4 Since completing the 2021 Preliminary Environmental Information Report (PEIR) (the purpose of which is to accompany the statutory consultation process and present information reasonably required to allow stakeholders and statutory consultees to develop an informed view of the likely significant effects of the Scheme), the design of the Scheme has continued to be developed and the

Application Boundary has been reviewed and refined as appropriate to reflect feedback from consultation. The development and refinement of the Application Boundary has not led to any changes that materially affect the content of the Scoping Opinion through the introduction of new land or development of a material nature.

- 4.3.5 Study areas have been defined individually for each environmental topic in **Chapters 5-14** of the **ES (Document Reference 6.1)**, taking account of the DMRB standards, the geographic scope of the potential impacts relevant to that topic or of the information required to assess impacts. The study areas are described within each relevant ES chapter.
- 4.3.6 The ES is based on the Application Boundary presented in the DCO application.

#### Identification of baseline and future conditions

- 4.3.7 In order to identify the effects of the Scheme on the environment, it is important to understand the environment that would be affected by the Scheme (the 'baseline conditions'). Understanding the baseline allows the measurement of changes that would be caused by the Scheme.
- 4.3.8 The baseline conditions are not necessarily the same as those that exist at the current time; they are the conditions that would exist in the absence of the Scheme either (a) at the time that construction is expected to start, for impacts arising from construction or, (b) at the time that the Scheme is expected to be open to traffic, for impacts arising from the operation of the Scheme. Therefore, the identification of the baseline and future conditions involves predicting changes that are likely to happen in the intervening period, for reasons unrelated to the Scheme. This entails taking current conditions, committed development and predicted changes resulting from climate change projections into consideration and using previous experience and professional judgment to predict what the baseline and future conditions might look like prior to start of construction and operation.
- 4.3.9 It is essential for an EIA that sufficient data is obtained to form the basis of the assessment. Each topic chapter includes a description of the current (baseline) environmental conditions and future baseline scenario. This is based on the study area identified for each topic chapter.
- 4.3.10 The ES presents baseline information representing the conditions of the environment at the time of writing (March 2022). When describing the future baseline scenario for each environmental factor within the respective topic chapters, readily available information such as local plans and climate change scenario data has been utilised to provide a description of the natural changes in the local environment over an appropriate timescale that the datasets support.



### **Defining assessment years and scenarios**

- 4.3.11 The assessment of effects in this ES involves comparing a scenario without the Scheme and a scenario with the Scheme. These are referred to as the Do-Minimum and Do-Something scenarios respectively.
- 4.3.12 The Do-Minimum scenario represents the future baseline with minimal interventions and without new infrastructure.
- 4.3.13 The likely significant environmental effects for Do-Something scenarios are assessed for the baseline year and future year or series of future years, depending on the environmental topic and the assessment requirements within the DMRB for specific topics.
- 4.3.14 For assessing construction phase effects, the baseline year represents the conditions prior to construction starting. If the DCO is granted, the construction phase is proposed to start in autumn 2024 and the Scheme proposed to be open to traffic in winter 2027.
- 4.3.15 The future year scenario (a period after the Scheme opens for traffic) is 2042, 15 years after opening, when all mitigation measures are likely to have achieved their desired outcome. It should be noted that some measures would achieve their desired outcome sooner or upon completion of their implementation.
- 4.3.16 For assessing operation phase effects (such as the effects of traffic on noise and air quality) the baseline year represents the situation prior to any effect e.g. opening the Scheme to traffic.
- 4.3.17 Where there are any potential differences in the 2027 and 2042 future baseline conditions, this is identified within the 'Future baseline' sub-section within the 'Baseline conditions' section of each topic chapter (where relevant).
- 4.3.18 Current scientific knowledge and methods of assessment have been used to identify foreseeable changes.

## **4.4 General assessment assumptions and limitations**

### **Dealing with uncertainty**

- 4.4.1 In assessing the effects of the Scheme from an environmental perspective, the principle of the 'Rochdale Envelope' has been applied as appropriate and necessary, in accordance with Planning Inspectorate advice note nine: Rochdale Envelope (Planning Inspectorate, 2018). The advice note states:

***The ‘Rochdale Envelope’ approach is employed where the nature of the Proposed Development means that some details of the whole project have not been confirmed (for instance the precise dimensions of structures) when the application is submitted, and flexibility is sought to address uncertainty.***

#### **Limits of deviation**

- 4.4.2 Limits of Deviation (LoD) are the limits within which the DCO would authorise the Scheme to be constructed. Changes to the preliminary Scheme design may occur typically as a result of ground conditions or environmental factors which it may not be possible to identify in the period prior to the DCO application being submitted. The LoD allow for a small tolerance with respect to any distances and points shown on the plans that accompany the DCO application. All works would take place within the LoD, the extent of which have been subject to full consideration as part of the EIA for the Scheme.
- 4.4.3 The DCO, if granted, would allow for the Scheme to be constructed anywhere within the maximum extent of the defined LoD. This would include a vertical deviation and a lateral deviation. As a result, there is some necessary flexibility as to the exact Scheme detail taken through to construction. A series of maximum LoD have been established and are defined in **Chapter 2 (The Scheme and its Surroundings)** of the **ES (Document Reference 6.1)**. The LoD are also outlined within the draft DCO and have been considered within **Chapters 5-15** of the **ES (Document Reference 6.1)**, having regard to the scope for change from the highway alignment. Accordingly, flexibility is accounted for within Scheme design, which is assessed in accordance with the Rochdale Envelope approach outlined above.

#### **Significance criteria**

- 4.4.4 The EIA process provides an evaluation of whether effects would be significant or not, considering the sensitivity of a specific environmental receptor, the nature and magnitude of change (for example if it is permanent or temporary, large scale or small scale) and whether it can be mitigated through good design or construction management.
- 4.4.5 The significance of effects has been determined as per DMRB LA 104 (Highways England, 2020) (i.e. by taking into account the value (sensitivity) of a receptor / resource and assessing against the magnitude of change to determine the overall significance of effect which could be either adverse or beneficial). **Tables 4.1 to 4.4** demonstrate how the overall significance of effects have been assessed using the matrix presented in DMRB LA 104.

Table 4.1: Environmental value (or sensitivity) and descriptions

Value (sensitivity) of receptor/resource	Typical description
Very high	Very high importance and rarity, international scale and very limited potential for substitution
High	High importance and rarity, national scale, and limited potential for substitution
Medium	High or medium importance and rarity, regional scale, limited potential for substitution
Low	Low or medium importance and rarity, local scale
Negligible	Very low importance and rarity, local scale

Table 4.2: Magnitude of impact

Magnitude of impact (change)		Typical description
Major	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse)
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial)
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse)
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial)
Minor	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse)
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or

Magnitude of impact (change)		Typical description
		elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial)
Negligible	Adverse	Very minor beneficial or adverse impact to one or more characteristics, features or elements.
	Beneficial	
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Table 4.3: Descriptors of the significance of effect categories

Significance category	Typical description
Very Large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

4.4.6 The significance of effects has been determined from a combination of the assessed value of the receptor / resource and the magnitude of change. Five levels of significance (very large, large, moderate, slight or neutral) are defined which apply to both adverse and beneficial impacts. An effect of moderate or above is taken to be significant in EIA terms. The matrix used to report the significance of an effect is presented in **Table 4.4**. The terms ‘impact’ and ‘effect’ have different meanings, with the effect referring to the environmental outcome caused by an impact.

Table 4.4: Significance matrix

	Magnitude of impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (sensitivity)	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

4.4.7 DMRB LA 104 recognises “the approach to assigning significance of effect relies on reasoned argument, the professional judgement of competent experts and using effective consultation to ensure the advice and views of relevant stakeholders are taken into account”.

4.4.8 **Table 4.4** illustrates how the DMRB describes the significance of effect. In arriving at the significance of effect, the assessor has also considered whether they are direct, indirect, secondary, cumulative, short, medium or long-term, permanent or temporary, positive or negative.

4.4.9 Not all of the environmental topics have used the above criteria or approach. For example, some topics do not use a matrix-based approach but instead use numerical values to identify potential impacts. Therefore, each environmental topic chapter has used the information provided above, any topic specific guidance as well as the assessor’s professional judgement to assess the significance of an effect. Where an effect could be one of two gradings (for example where a negligible impact interacts with a medium sensitivity receptor resulting in a neutral or slight significance of effect), professional judgement has been used to determine which effect is applicable and this has been explained in the associated commentary.

4.4.10 Effects determined to be slight or neutral are not deemed to be significant, whilst these are reported in the ES, they are not reported in detail and do not require specific mitigation. The exception to this is where the combination of multiple slight effects has the potential to lead to significant (i.e. moderate or above) cumulative effects (see **Chapter 15 (Cumulative Effects)** of the **ES (Document Reference 6.1)**).

#### **4.5 Duplication of assessment**

4.5.1 This ES has been prepared, taking into account other relevant environmental assessments with a view to avoiding duplication of assessment.

##### **Habitats Regulations Assessment (HRA)**

4.5.2 A HRA has been undertaken in accordance with the *Conservation of Habitats and Species Regulation 2017*. The **HRA (Document Reference 7.5)** is included within the DCO application.

##### **Water Framework Directive (WFD) Compliance Assessment**

4.5.3 A WFD Compliance Assessment has been undertaken (**Document Reference 7.7**). This considers the extent to which the Scheme could impact on the current and future target WFD status of the water bodies. The results are presented in **Chapter 13 (Road Drainage and the Water Environment)** of the **ES (Document Reference 6.1)**.

##### **Flood Risk Assessment (FRA)**

4.5.4 An **FRA (Document Reference 7.4)** has been undertaken to consider the influence of the Scheme on local flooding and the mitigation measures embedded in the Scheme design.

##### **Case for the scheme**

4.5.5 The **Case for the Scheme (Document Reference 7.1)** and **National Policy Statement for National Networks (NPS NN) Accordance Table (Document Reference 7.2)** includes consideration of the Scheme's compliance with planning policy.

#### **4.6 Design, mitigation and enhancement measures**

4.6.1 One of the key requirements of EIA is that measures are taken to avoid, reduce and, where possible, remedy significant adverse environmental effects. These are termed mitigation measures and their development is part of an iterative EIA process.

4.6.2 Environmental assessment and design incorporates mitigation measures using a hierarchical system as outlined in **Table 4.5**.

Table 4.5: Mitigation hierarchy

Mitigation hierarchy	Description
1 – Avoidance and prevention	Design and mitigation measures to prevent the effect (e.g. alternative design options or avoidance of environmentally sensitive sites).
2 – Reduction	Where avoidance is not possible, then mitigation has been used to lessen the magnitude of impact.
3 – Compensation/remediation	Where it is not possible to avoid or reduce a significant adverse effect, the measures to offset the effect have been considered.
4 – Enhancement	Where possible enhancement measures have been incorporated into the Scheme. Enhancement measures are considered to be over and above any avoidance, mitigation and compensation measures required to remove the adverse impacts of the Scheme. Enhancement measures are not factored into the determination of residual significant effects. However, the potential additional benefits are still identified within the ES.

4.6.3 Mitigation measures have been developed in response to the findings of surveys, assessments and consultation. These mitigation measures are designed principally to address impacts whose occurrence, timing and location can be predicted in advance and are intrinsic to the design of the Scheme.

4.6.4 The ES reports the following categories of mitigation:

- Embedded mitigation: matters forming part of the design of the Scheme which are fixed and without which the Scheme cannot be delivered. They are integrated into a project for the purpose of minimising environmental effects and secured through the granting of the DCO
- Essential mitigation: mitigation critical for the delivery of a project, the deliverability of which is flexible

4.6.5 The first preference in mitigating any impact is to seek engineering design measures to entirely avoid or eliminate the impact. Where this is not possible, the mitigation should seek to reduce the magnitude of the impact. Impacts can be avoided or reduced, for instance, through changes to the horizontal or vertical alignment of the scheme, junction strategy or other aspects of the Scheme layout; or through changes in the methods and/or materials to be used in construction.



4.6.6 The Scheme assessed within this ES includes a number of engineering design measures that have been designed to avoid or reduce significant adverse environmental effects arising, where practicable. Those measures forming part of the Scheme design are outlined in the paragraphs that follow:

- Reuse of earth arisings to facilitate construction of the Scheme where possible to minimise fill material being needed to be brought on to site or taken offsite
- Reuse of excess earth arisings to facilitate landscape mitigation within the Application Boundary
- Design of the new bridge over the River Itchen to be a clear span structure with abutments set back from the river channel
- Use of underpasses where possible rather than bridges to reduce visual impact of the Scheme
- Use of low noise road surface finishing where new roads surfaces are to be laid
- Non-intrusive temporary construction measures within the River Itchen to facilitate cleaning of an existing headwall, and installation of two new headwalls to serve the operational drainage strategy
- Retention of existing vegetation where possible, particularly established/mature woodland habitats, and measures for their protection
- Retention of existing pavements where possible to provide efficiencies and reduce the need for construction of new pavements
- The drainage strategy has been designed to reduce the opportunity for pollutants from road drainage to be discharged to the sensitive chalk aquifer by restricting infiltration of captured drainage water until after pollutants have been removed
- The concurrent works to install new drainage outfalls and the new bridge over the River Itchen, resulting in reduced duration for associated PRoW closures
- Use of warm rolled asphalt for installation of road surfacing, not hot rolled asphalt (resulting in reduced carbon emissions and energy requirements)

4.6.7 Embedded mitigation measures are summarised in the Register of Environmental Actions and Commitments (REAC), contained within the **first iteration Environmental Management Plan (fiEMP) (Document Reference 7.3)**.



4.6.8 Where avoidance of an impact through engineering design measures is not possible, or is only partly effective, further (essential) mitigation measures may be required. Essential mitigation falls into three broad categories:

- Measures that do not remove an impact but make it less significant. A typical example on the Scheme includes the use of cuttings or reprofiled earthworks to screen views of the road where it is visually intrusive
- The like-for-like replacement of a feature that would be lost. For example, the creation of woodland on the Scheme alignment to replace those that required to be removed to facilitate the construction of the Scheme
- The provision of a beneficial effect that is related to the impact but is not a like-for-like replacement of the feature to be lost. For example, creation of new ecological habitat (woodland, chalk grassland) to address other habitat lost to facilitate construction

4.6.9 The following bullet points provide examples of essential mitigation measures to avoid, prevent or reduce adverse environmental effects:

- Any litter items such as packaging would be regularly removed from the work area around the River Itchen and in the interim to prevent litter being blown into the river area netted bins would be provided
- During the construction phase the risk of a hydraulic failure on a machine resulting in fluid leakage into the River Itchen would be controlled by bunds situated around the machine and plant nappies installed underneath the machine
- To reduce the impact on the remaining trees during construction of the bridge abutments near the River Itchen and placement of the main span, ground protection mats would be utilised and exclusion zones provided to prevent root damage. Liaison would be carried out with vegetation clearance specialists to ensure the optimum route is utilised taking safety and minimum clearance into account
- A dust protection frame with cover would be placed across the river in the works area for the duration of the Kingsworthy Bridge strengthening during operation. The design of any dust protection frames for pontoons would be undertaken in consultation with an ecologist
- Reduce the need for dewatering through the prevention of water entering excavations by limiting their time of opening to only that required
- Minimising the amount of exposed ground and soil stockpiles, stripping topsoil only when needed and minimising time that the ground is exposed where possible
- Soil stockpiles would be located away from watercourses

- Rapid re-seeding/ planting of soil stockpiles to limit soil erosion and run-off
- Use of silt fences to minimise silt entry into aquatic systems
- Plant and wheel washing, as well as haul road dampening
- Plant re-fuelling to take place in designated locations at a safe distance from water courses and good practice measures installed to reduce pollution (for example, adequate bunding)
- Spill kits to be positioned at strategic locations on site and comprehensive training provided for staff to ensure a rapid and effective response to incidents
- Use of settlement tanks as required
- Use of an Environmental Manager / Ecological Clerk of Works
- Toolbox talks to ensure contractors are aware of potential risks and mitigating measures
- Creation of an Incident Response Plan

4.6.10 The essential mitigation measures identified in the topic chapters of the ES are contained within the **fiEMP (Document Reference 7.3)**. Details of essential mitigation are also included in **Figure 2.3 (Environmental Masterplan)** of the **ES (Document Reference 6.2)** where relevant and described in the relevant ES topic chapters.

4.6.11 The significance of an effect is reported after an assessment of the effectiveness of the design and mitigation measures (the residual effect).

#### **Implementation and enforcement of mitigation**

4.6.12 Mitigation would be secured by way of requirements in the DCO. The Scheme must comply with these requirements.

4.6.13 The second iteration Environmental Management Plan (siEMP) would be implemented and is secured through a Requirement in the DCO. The siEMP would need to be prepared in accordance with the **fiEMP (Document Reference 7.3)** submitted with the DCO application as part of the ES.

4.6.14 Construction works would be legally obliged to comply with the Requirements in the DCO.

#### **Environmental enhancement**

4.6.15 Enhancement is a measure that is over and above what is required to mitigate the adverse effects of a scheme. Enhancement opportunities have been

considered throughout the design development and are reported within the ES topic chapters.

4.6.16 The following items may be relevant to the design and delivery of enhancement opportunities:

- National and local policy requirements
- Policy and performance requirements of the overseeing organisation
- Scheme specific objectives

4.6.17 Enhancements are also outlined within the **fiEMP (Document Reference 7.3)**.

## 4.7 Monitoring

4.7.1 The EIA Regulations require “*the monitoring of any significant adverse effects on the environment of proposed development*”. It is important to note that the EIA Regulations only require the monitoring of significant adverse effects.

4.7.2 Regulation 21 (3) of the EIA Regulations states that the Planning Inspectorate should:

*“(b) take steps to ensure that the type of parameters to be monitored and the duration of the monitoring are proportionate to the nature, location and size of the proposed development and the significance of its effects on the environment; and*

*(c) consider, in order to avoid duplication of monitoring, whether any existing monitoring arrangements carried out in accordance with an obligation under the law of any part of the United Kingdom, other than under the Directive, are more appropriate than imposing a monitoring measure.”*

4.7.3 Schedule 4 to the EIA Regulations states that an ES should identify “*any proposed monitoring arrangements*”. The **fiEMP (Document Reference 7.3)** includes a Record of Environmental Actions and Commitments to clearly identify the monitoring that is proposed in relation to any significant adverse effects that have been identified. Any such monitoring would be proportionate, as noted above.

## 4.8 Major accidents and disasters

4.8.1 The assessment of major accidents and disasters, hereafter referred to as “major events”, as required by the EIA Regulations should cover:

- Vulnerability of the Scheme to risks of major events
- Any consequential changes in the predicted effects of the Scheme on environmental topics

4.8.2 In the absence of a current industry definition of major events in the context of EIA, the following definitions have been used to inform the identification of potential major events related to the Scheme.

4.8.3 The Control of Major Accidents and Hazards (COMAH) 2015 Regulations define major accidents as follows:

*“Major accident means an occurrence such as a major emission, fire, or explosion ... leading to serious danger to human health or the environment;*

*Serious danger to human health means a risk of death, physical injury or harm to health, e.g.: (a) a substantial number requiring medical attention; (b) some people seriously injured, requiring prolonged treatment”.*

4.8.4 The United Nations Office for Disaster Risk Reduction (UNISDR, 2017) defines disaster as follows:

*“A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts”.*

4.8.5 As such major accidents and disasters are very closely linked. They can be natural or man-made and could include:

- Severe weather, for example, floods, earthquakes, hurricanes, storms, drought
- Tsunamis, extremes of temperature – hot and cold
- Transport accidents, for example, rail accidents, motorway pileups, plane crash
- Industrial (for example, explosions, pollution and fire)
- Terrorism
- Disease outbreaks

4.8.6 With regards to the Scheme, the following potential major events have been identified (**see Appendix 4.1 (Major Events Screening Assessment) of the ES Document Reference 6.3**):

- Severe weather: storms, floods
- Transport accidents: road
- Ground Instability

- Chalk dissolution/sinkholes

4.8.7 These were identified based on the site location, nature of the Scheme, likelihood of occurrence and surrounding land uses. They have also been informed by the PCF Stage 2 Environmental Assessment Report (EAR) (WSP, 2017i), the PCF Stage 2 Safety Plan and the PCF Stage 2 Health and Safety Risk Register.

4.8.8 The assessment of major events has been inherently conducted within the relevant technical chapters of this ES, as referred to below in **Table 4.6**.

Table 4.6: Major events and associated EIA topics applicable to the Scheme

Major Event	Potential environmental impacts	EIA topic
Storms	Flooding High winds causing damage to environmental receptors and structures	Chapter 13 - Road Drainage and the Water Environment Chapter 14 - Climate
Floods	Flooding	Chapter 13 - Road Drainage and the Water Environment
Transport accidents – road	Environmental pollution incidents, emissions to air, ground and water	Chapter 5 - Air Quality Chapter 8 - Biodiversity Chapter 9 - Geology and Soils Chapter 13 - Road Drainage and the Water Environment
Ground Instability	Unstable ground from geological units or made ground causing potential for collapsible/compressible ground or landslides.	Chapter 9 - Geology and Soils
Chalk Dissolution/Sinkholes	Subsidence	Chapter 9 - Geology and Soils

## 4.9 Consideration of climate change

4.9.1 The ES considers effects related to climate change as per the requirements of the EIA Regulations. **Chapter 14 (Climate)** of the **ES (Document Reference 6.1)** outlines an assessment of the effect of the Scheme on climate and the vulnerability of the Scheme to climate change.

4.9.2 Climate change projections have been embedded into the future baseline of the technical assessments. Current and future climate baselines are outlined in

**Chapter 14 (Climate)** of the **ES (Document Reference 6.1)** for key climate parameters, including winter and summer temperature and precipitation. The projections have been obtained from the *Met Office UK Climate Projections 2018 (UKCP18)*, which provides the most up-to-date assessment of how the climate of the UK may change over the 21st century.

- 4.9.3 Climate change is considered in both the assessment of the Scheme effects and the design of mitigation and enhancement measures. The consideration of the Scheme's resilience to climate change is assessed qualitatively, based on the future climate trends outlined in **Chapter 14 (Climate)** of the **ES (Document Reference 6.1)**. The assessment of the Scheme's contribution to climate change, through release of greenhouse gas emissions, is a quantitative assessment against the legislated UK Government's carbon budgets.
- 4.9.4 The potential for climate change to exasperate the residual effects of each assessment is also considered within **Chapters 5-14** of the **ES (Document Reference 6.1)**.

#### **4.10 Cumulative effects**

- 4.10.1 Cumulative effects result from multiple actions on receptors over time and are generally additive or interactive (synergistic) in nature. They can also be considered as effects resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the Scheme, identified as:
- Combined effects from the Scheme (i.e. the interrelationship between different environmental factors where numerous different effects impact a single receptor).
  - Cumulative effects from different projects (together with the Scheme being assessed).
- 4.10.2 The methodology for cumulative effects with 'other development' is presented in **Chapter 15 (Cumulative Effects)** of the **ES (Document Reference 6.1)**.