A12 Chelmsford to A120 widening scheme

TR010060

9.58 Case for the Scheme: Appendices H & I – Draft Energy & Gas Supply Accordance Tables

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A12 Chelmsford to A120 widening scheme

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Introduction

The A12 Chelmsford to A120 widening scheme (the proposed scheme) comprises improvements to the A12 between junction 19 (Boreham interchange) and junction 25 (Marks Tey interchange), a distance of approximately 24km, or 15 miles, as seen on the Location Plan [APP-005]. The proposed scheme involves widening the A12 to three lanes throughout (where it is not already three lanes) with a bypass between junctions 22 and 23 and a second bypass between junctions 24 and 25. It also includes safety improvements, including closing off existing private and local direct accesses onto the main carriageway, and providing alternative provision for walkers, cyclists and horse riders (WCH) to existing routes along the A12, which would be removed. The proposed scheme is classed as a Nationally Significant Infrastructure Project (NSIP), and an Environmental Impact Assessment (EIA) has been submitted to support the application for a DCO.

National Highways, formerly known as Highways England, announced in October 2019 its preferred route from junction 19 to junction 23. In 2019 the Local Authorities of Colchester, Braintree and Tendring pursued a joint Local Plan which proposed several garden communities that could impact on the route options for junction 23 to junction 25. In May 2020, the Planning Inspectorate made the recommendation that the proposed Colchester/Braintree Border Garden Community be removed from the North Essex Authorities draft Section 1 local plan which is detailed in Chapter 3: Assessment of alternatives, of the Environmental Statement (ES) [APP-070] and in the Case for the Scheme (CftS) [APP-249]. This resulted in National Highways making a Preferred Route Announcement for the remaining section between junctions 23 and 25 (August 2020) based on October 2017 stakeholder consultation routes. Preliminary design (Project Control Framework Stage 3) then commenced for the entire route, initiating the DCO pre-application process with the intention of submitting the application for development consent in Summer 2022.

Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)

In order to construct the proposed scheme, the Cadent owned gas main named "The Witham South to Little Braxted Gas Governor High Pressure Gas Main (AIA2)" (hence forward gas main diversion) between Witham bypass and Little Braxted needs to be diverted (see the Case for the Scheme [APP-249]. As discussed in the Case for the Scheme (paragraphs 4.5 and 4.6), this diversion fulfils the criteria set out in section 20 of the Planning Act 2008 by which a gas pipeline qualifies as a Nationally Significant Infrastructure Project (NSIP) in its own right.

The gas main diversion, although an NSIP in its own right, is part of the proposed scheme (road widening) which requires an EIA. The Environmental Statement [APP-068- APP-085] has been prepared by competent experts to provide specified information to enable the Examining Authority, the Secretary of State and all stakeholders to understand the likely significant environmental effects of the proposed scheme including the gas main diversion. However, due to the scale and location of the gas main diversion, a separate EIA screening exercise was undertaken by the Applicant against the EIA Regulations, which can be found in Appendix 5.2 of the Environmental Statement [APP-097]. The gas main diversion is also assessed in each topic chapter of the ES in conformity with the relevant adopted and draft Energy NPS. The ES [APP-068- APP-085] topic specific chapters have each a section dedicated to the gas main diversion and how the diversion was assessed, there is also the EIA screening exercise specific to the gas main. When referring to the topic specific ES chapter for the gas main diversion, this table refers to the gas main diversion as part of the proposed scheme. When referring to the gas main diversion on its own screening exercise then its referred to as just gas main diversion.

This draft Energy (EN-1) and Gas Supply National Policy Statement (EN-4) Accordance Table is supplementary to Case for the Scheme: Appendices B,C,D,E: National Networks National Policy Statement Accordance Table [APP-251] and has been prepared as a result of the draft Energy NPS' being released for consultation in March 2023.

As the proposed scheme was accepted for examination before the designation of the 2023 amendments, the 2011 energy NPS's will remain in force in its entirety and have affect as per the Consultation Planning for New Energy Infrastructure from the Department for Energy Security & Net Zero. It is noted by the Applicant that the draft Energy NPS' are potentially capable of being important and relevant considerations in the decision-making process and therefore has produced this document to assist the Secretary of State in considering the extent to which they are relevant.

Table 1. Overarching National Policy Statement for Energy (EN-1)

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
4.2 Environmental Principles		
4.2.1	All proposals for projects that are subject to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) must be accompanied by an Environmental Statement (ES) describing the aspects of the environment likely to be significantly affected by the project.	The gas main diversion is an 'EIA development' because it is of a type of development listed within schedule 2, regulation 3(1), part 3(b) (energy industry) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations) and could generate significant environmental effects by virtue of its nature, scale and location. The EIA screening exercise is documented in Appendix 5.2: Gas main diversion screening assessment [APP-097]. In accordance with paragraph 4.2.1 of EN-1 an EIA has been undertaken which describes and assesses the effects of the gas main diversion on humans, fauna and flora, soil, water, air, climate, the landscape, material assets and cultural heritage. The findings of the EIA are presented in the Environmental Statement (ES) for the proposed scheme [APP-068- APP-085] which includes a description of the gas main diversion, the likely significant environmental effects, the measures to avoid, reduce, or offset such effects and the alternatives considered. Combined effects of the different aspects are reported within individual chapters of the ES in accordance with Chapter 5: Environmental Assessment Methodology [APP-072].

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4.2.2	The Regulations specifically refer to effects on population, human health, biodiversity, land, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them.	The social and economic effects of the gas main diversion are assessed as part of Chapter 13: Population and human health, of the ES [APP-080 APP-080] and in Appendix 13.4: Mental Wellbeing Impact Assessment [APP-156]. The Equality Impact Assessment [APP-270] discusses how the requirements of the Equality Act 2010 have been embedded in the scheme's development, including design, communication and engagement strategy, and mitigation strategies.
4.2.3	The Regulations require an assessment of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, transboundary, short, medium, and long-term, permanent, and temporary, positive and negative effects at all stages of the project, and also of the measures envisaged for avoiding or mitigating significant adverse effects.	The cumulative assessment can be found in Chapter 16: Cumulative Effects, of the ES [APP-083]. It has been carried out in accordance with the Planning Inspectorate's Advice Note Seventeen: Cumulative Effects Assessment (published August 2019). The assessment sets out how the effects of the proposed scheme (which includes the gas main diversion) would combine and interact with the effects of other development projects, whether existing, awaiting consent, already consented or otherwise reasonably foreseeable. In addition, an assessment has been made of potential cumulative impacts from the proposed scheme (which includes the gas main diversion) on the socio-economic aspects of housing and access to services, facilities, employment, education, and skills. This assessment has been made in recognition that there are several nationally significant infrastructure projects in the region beyond the population and human health study area, which may contribute to potentially significant cumulative impacts for

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
		the proposed scheme. Chapter 16 also assesses the significance of cumulative effects for both the construction and operation phases of the proposed scheme (which includes the gas main diversion).
4.2.4	To consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, biodiversity net gain, community cohesion, health and well-being.	The social and economic effects of the gas main diversion are assessed as part of Chapter 13: Population and human health, of the ES [APP-080] and in Appendix 13.4: Mental Wellbeing Impact Assessment [APP-156]. The Equality Impact Assessment [APP-270] discusses how the requirements of the Equality Act 2010 have been embedded in the scheme's development, including design, communication and engagement strategy, and mitigation strategies.
4.2.5 and 4.2.7	For the purposes of this NPS and the technology specific NPSs the ES should cover the environmental, social and economic effects arising from pre-construction, construction, operation and decommissioning of the project. In the absence of any additional information on additional assessments, the principles set out in this Section will apply to all assessments	The social and economic effects of the gas main diversion are assessed as part of Chapter 13: Population and human health, of the ES [APP-080] which considers, construction and operational effects. It is highly unlikely that the gas main diversion would be decommissioned as the improvements would become an integral part of Cadent's gas network. In the unlikely event of the pipeline needing to be demolished, this would conform to the statutory process in place at that time, including any requirements for EIA as appropriate.
4.2.11	In some instances, it may not be possible at the time of the application for development consent for all aspects of the	The gas main diversion is part of a number of utilities being diverted by the respective statutory undertakers. These diversions are subject to feasibility studies and preliminary

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	proposal to have been settled in precise detail. Where this is the case, the applicant should explain in its application which	design carried out by the statutory undertakers, (as defined in the New Road and Street Works Act 1991). The gas main diversion currently has a draft scheme and budget estimate, this has formed the basis of the information presented in this application. As part of the development of the proposed scheme the Applicant carried out a gas main diversion screening assessment available at Appendix 5.2 of the ES [APP-097where an initial desk assessment of the possible environmental effects is captured. The Case for the Scheme (CftS) [APP-249] includes a gas main diversion statement which explains the characteristics of the pipeline, the need for its diversion and work done to identify possible routes. This section also contains details of the diverted pipeline in accordance with regulation 6(4) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009. The draft DCO [REP3-002] provides the limits of deviation both laterally and vertically. These limits have been included in the proposed scheme in order to allow a necessary, but proportionate, degree of flexibility to facilitate the detailed design and construction stages of the proposed scheme. The limits of deviation have been considered when undertaking all technical assessments, including those specific to the gas main diversion, in relation to the proposed scheme. Chapter 5: Environmental assessment methodology, of the ES [APP-072] sets out the assessment methodology and

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		approach taken to prepare the EIA. Chapter 5 also includes details of how the proposed scheme has been assessed where information was not available to inform the assessment. In addition, each of the aspect chapters gives a description of the assumptions made and the limitations of the assessment in relation to the scheme as a whole and the gas main diversion.
4.2.12	Where some details are still to be finalised, the ES should, to the best of the applicant's knowledge, assess the likely worst-case environmental, social and economic effects of the proposed development to ensure that the impacts of the project as it may be constructed have been properly assessed.	The location and Order Limits of the proposed scheme are illustrated on Figure 1.1: Location Plan [AS-024]. Limits of deviation have been incorporated within the Order Limits to allow minor modifications to be made to the proposed scheme during the detailed design and construction stages. The ES [APP-068- APP-085] approach is to provide an assessment of the proposed scheme design based on the realistic worst-case scenario afforded by the limits of deviation to be sought within the DCO application. This is therefore the maximum possible extent of the proposed scheme and as such has been assessed within the ES. The EIA screening exercise documented in Appendix 5.2 of the ES [APP-097] provides a desk based study of the area where the proposed gas main diversion is to be installed, reporting on possible significant effects on the environment.
4.2.15 and 4.2.17	Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and	Chapter 3: Assessment of alternatives, of the ES [APP-070] sets out in Table 3.5 the main alternatives for the gas main diversion, considered by the Applicant and how the preferred option was determined through consideration of environmental effects. This is in line with the requirements

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
	economic effects and including, where relevant, technical and commercial feasibility. Where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements.	of the EIA Directive. The Consultation Report [APP-045] also sets out the options that the public were consulted on. A Detailed Water Environment Regulations Compliance Assessment (WFD) has been carried out and is presented in Appendix 14.2 [APP-159]. It shows compliance for all designated water bodies assessed therefore no consideration of WFD alternatives is required. A Habitats Regulations Directive (HRA) assessment has been carried out and is presented in Appendix 6.8 Habitats Regulations Assessment No Significant Effects Report [APP-201]. It concludes that no likely significant effects on any sites within the national site network are anticipated, when considered alone or in combination with other plans or projects. Therefore, no consideration of alternatives is required. A flood risk sequential test has been carried out and is reported within Appendix 14.5: Flood Risk Assessment (FRA) [APP-162]. Subsequently an exception test was required, the results of which show that the proposed scheme passes the requirements of the test. The proposed scheme is not located within or near any National Park, The Broads or any Area of Outstanding Natural Beauty (AONB). Therefore, no alternatives assessment relating to these features is required. The proposed scheme is identified in both RIS1 (2015-2020) and RIS 2 (2020-2025). Therefore, option-testing does not need to be considered by the Examining Authority

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		or the decision maker as this assessment has already been undertaken. Design options considered and appraised as part of the proposed scheme's development process are presented in Chapter 3: Assessment of alternatives, of the ES [APP-070) and Section 3.2 of the CftS [APP-249]. The main development stages included: • Initial options identification, assessment and sifting. • Options development and shortlisting. • Assessment of shortlisted options to identify viable options for consultation. • Consultation and option selection. • Preferred Route Announcement (PRA). • Design development for statutory consultation. • Continued design development post statutory consultation.
4.3 Health		
4.3.4 - 4.3.5	As described in the relevant sections of this NPS and in the technology specific NPSs, where the proposed project has an effect on humans, the ES should assess these effects for each element of the project, identifying any potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate.	The cumulative impacts of the proposed scheme (which includes the gas main diversion) on health have been assessed in Chapter 16: Cumulative Effects, of the ES [APP-083]. This has been informed by Chapter 13: Population and human health, of the ES [APP-080].

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	The impacts of more than one development may affect people simultaneously, so the applicant should consider the cumulative impact on health in the ES where appropriate	
4.3.6	Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society, i.e. those groups which may be differentially impacted by a development compared to wider society as a whole	Opportunities to limit adverse impacts on health and maximise benefits have been identified within Chapter 13: Population and human health, of the ES [APP-080]. This chapter also references other relevant aspect chapters, including Chapter 6: Air quality [APP-073], Chapter 8: Landscape and visual [APP-075], Chapter 12: Noise and vibration, and Chapter 15: Climate, of the ES [APP-082], which include impacts on human health. Examples of mitigation contained in the REAC within the first iteration of the EMP [APP-185] include: • use of best practice construction measures, including careful scheduling of road and footpath closures/diversions • maintaining access along routes used by WCH during construction • control of noise, vibration and dust during construction • air quality improvements • new and improved WCH provision • the use of low noise surfacing, bunds and barriers to mitigate adverse noise impacts

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		• setting the alignment into the existing landscape with the addition of planting to screen views and limit adverse visual impacts The assessment of impacts against determinants of health scoped into the assessment is provided in Section 13.11 of Chapter 13: Population and Health of the ES [APP-080]. 'Human health' considers the potential impacts on each identified determinant from all relevant pathways (including, but not limited to, changes in air quality and noise, land-take, vegetation removal, disruption in access or amenity to routes used by WCH, access to community facilities and assets, and employment opportunities). Chapter 16: Cumulative effects assessment, of the ES [APP-083], assesses the potential for cumulative impacts on health which might arise in combination with other developments.
4.5 Environment and Biodiversity Net Gain		
4.5.4	Energy NSIP proposals, whether onshore or offshore, should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, or the wider environment where possible.	The Applicant has sought to maximise biodiversity delivery, with the proposed scheme forecasting an overall net gain of 25% for habitats, 36% for hedgerows and 157% for rivers (Table 9.32 of Chapter 9 Biodiversity [APP-076]) on-site post-construction. This includes habitat retention, creation and enhancement. One example of seeking enhancement opportunities relates to hedgerows, whereby a detailed assessment identified 45 hedgerows across the proposed scheme with potential for

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		enhancement. The aim would therefore be to increase their overall condition, with the added benefit of improving diversity for the species they support and connectivity across the landscape (paragraph 9.10.121 of Chapter 9 [APP-076]). Full details of proposed enhancements are provided in Section 9.10 of Chapter 9 [APP-076].
4.5.5	In England applicants for onshore elements of any development are encouraged to use the most current version of the Defra biodiversity metric106 to calculate their biodiversity baseline and present planned biodiversity net gain outcomes. This calculation data should be presented in full as part of their application.	Biodiversity Net Gain (BNG) for the proposed scheme has been calculated using Natural England's Biodiversity Metric 3.0 Calculation Tool, which was the latest version of the metric available at the time (Appendix 9.14 Biodiversity Net Gain Report [APP-138]). This is an updated version of the original Defra Biodiversity Metric. It is noted that the Biodiversity Metric 3.1 has since been released (April 2022). This tool will be considered for future metric calculations.
4.5.6	Where possible, this data should be shared with the Local Authority and Natural England for discussion at the pre-application stage as it can help to highlight biodiversity and wider environmental issues which may later cause delays if not addressed.	The Applicant has sought the advice of Natural England throughout the development of the proposed scheme. A Stage 1 Screening Assessment concluded that no likely significant effects on any European sites are anticipated when considered alone or in combination with other plans and projects. The response received from Natural England is contained in Appendix E of the Habitats Regulations Assessment No Significant Effects Report [APP-201], which states that they are in agreement with the assessment. The Applicant has engaged with Natural England (using the Discretionary Advice Service) regarding mitigation proposals (see Table 9.1 of Chapter 9 Biodiversity [APP-076]). In their response to 3.0.4 of the Examining

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		Authority's written questions [REP3-016] Natural England commented that they are satisfied that their Standing Advice has been followed with respect to the approach towards mitigation of impact upon protected species.
4.5.8	Biodiversity net gain should be applied after compliance with the mitigation hierarchy and does not change or replace existing environmental obligations.	The proposed scheme has taken into account the locations of valuable and priority habitats, including important connective habitats (i.e. hedgerows, watercourses and treelines) and the location of protected species. The mitigation hierarchy has been followed to modify the design to avoid impacts to these features where practicable. In addition, opportunities to enhance biodiversity have been proposed. Mitigation and enhancement measures are described within Section 9.10 of Chapter 9: Biodiversity, of the ES [APP-076].
4.5.9 - 4.5.10	Biodiversity net gain can be delivered onsite or wholly or partially off-site. Any off-site delivery of biodiversity net gain should also be set out within the application for development consent When delivering biodiversity net gain off-site, developments should do this in a manner that best contributes to the achievement of relevant wider strategic outcomes, for example by increasing habitat connectivity or enhancing other ecosystem service outcomes. Reference should be made to relevant national or local plans and strategies, to inform off-site biodiversity net gain delivery. If published, the relevant strategy is the Local Nature Recovery Strategy (LNRS). If an LNRS has not been published, the relevant consenting body or planning	As per Appendix 19.4 Biodiversity Net Gain of the ES [APP-138] and shown in Table 3, b the baseline for the proposed scheme was assessed on-site and would be delivered on-site and therefore no off-site mitigation or compensation is proposed. Design principles which consider green infrastructure objectives to reduce significant effects on green infrastructure assets are presented in the Design Principles document [APP-280] and cover multiple aspects relevant to green infrastructure, including biodiversity. The Environmental Masterplan [APP-086 - APP-088] visually presents the proposed onsite biodiversity net gain.

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	authority may specify alternative plans, policies or strategies to use	
4.5.11	In addition to delivering biodiversity net gain, developments may also deliver wider environmental gains and benefits to communities relevant to the local area, and to national policy priorities, such as • reductions in GHG emissions, • reduced flood risk, • improvements to air or water quality, • climate adaptation, landscape enhancement, or • increased access to natural greenspace including trees and woodlands. The scope of potential gains will be dependent on the type, scale, and location of specific projects. Applicants should look for a holistic approach to delivering wider environmental gains and benefits through the use of nature-based solutions and Green Infrastructure.	The Design and Access Statement (DAS) [APP-268] shows how design was considered on the proposed scheme as a whole and how the proposed scheme will promote access to green space.. Figure 2.1: Environmental Masterplan [REPI4-015] is also available to demonstrate how maximising biodiversity and mitigation of environmental impacts is proposed. Reductions in flood risk are discussed within Chapter 14: Road drainage and the water environment, of the ES [APP-081]. Where significant, beneficial and adverse effects are recorded within Tables 14.18 and 14.19. No significant effects have been recorded for water quality.
4.5.13	Applications for development consent should be accompanied by a statement demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into proposals as part of good design (including any relevant operational aspects) of the project.	The Defra 3 biodiversity metric is being applied to the proposed scheme (including the gas main diversion), with the aim of maximising biodiversity value. The proposed scheme is exceeding 10% net gain. Further details of the methodology can be found within Appendix 9.14: Biodiversity Net Gain report [APP-138].

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4.5.14	Applicants should make use of available guidance and tools for measuring natural capital assets and ecosystem services, such as the Natural Capital Committee's 'How to Do it: natural capital workbook', Defra's guidance on Enabling a Natural Capital Approach (ENCA)109, and other tools that aim to enable wider benefits for people and nature.	In line with HM Treasury Green Book guidance, an Appraisal Summary Table was produced which includes appraisal of several environmental topics. This is presented in the Combined Modelling and Appraisal Report - Appendix E: Economic Appraisal Package - Appraisal Summary Table and Supporting Worksheets Report [APP-266]. The scope of this appraisal was agreed with the Department for Transport and did not include an appraisal of natural capital, which the Green Book does not prescribe for projects such as the scheme. However, as the proposed scheme develops, its Business Case will be refined further. As part of this refinement, the need to include a natural capital appraisal will be discussed with the Department for Transport.
4.5.15	Where environmental net gain considerations have featured as part of the strategic options appraisal process to select a project, applicants should reference that information to supplement the site-specific details.	The Options Assessment Report (Highways England, 2016) details the appraisal process for the proposed scheme. The OAR was carried out in accordance with the Department for Transport's Road Investment Strategy (RIS), the objectives of which include delivering better environmental outcomes. Other policies including the National Planning Policy Framework as well as local policies were also used to inform the OAR. At the time of producing the OAR, environmental net gain was not a policy requirement and was therefore not explicitly explored. However, environmental effects were assessed and this information was used to inform the selection of the preferred route as evidenced within the A12

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		Chelmsford to A120 widening: Scheme Assessment Report (Highways England, 2017) and A12 Chelmsford to A120 Widening Scheme: Scheme Assessment Report Addendum (Highways England, 2020).
4.6 Criteria for "Good design" for Energy Infrastructure		
4.6.5 Good design, project board level design champion	To ensure good design is embedded within the project development, a project board level design champion could be appointed, and a representative design panel used to maximise the value provided by the infrastructure. Design principles113 should be established from the outset of the project to guide the development from conception to operation.	Appendix 5.2: Gas main diversion screening assessment [APP-097] was prepared to explain the corridor choice and mitigations proposed to manage impacts of the project. A Design Principles Statement [APP-280] was prepared to explain how design is imbedded onto the overall scheme design, including the gas main diversion.
4.6.6	Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, land form and vegetation. Furthermore, the design and sensitive use of materials in any associated development such as electricity substations will assist in ensuring that such development contributes to the quality of the area. Applicants should also, so far as is possible, seek to embed opportunities for nature inclusive design within the design process	Consideration of aesthetics and good design would consist of replanting along the easement of the gas main diversion and would be carried out in accordance with Cadent Gas guidance and best practice standards. Where woodland vegetation would be lost and trees could not be replaced in situ due to the restrictions of the pipeline easement, native shrub planting would be used in line with that guidance. Where tree lines and tree belts would be lost and could not be replaced due to the restrictions of pipeline easement, native hedgerow planting would be used in line with the guidance.
4.6.7	Applicants must demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were	The CftS [APP-249] sets out how the proposed scheme's design evolved, whilst Chapter 3: Assessment of

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
	considered, applicants should set out the reasons why the favoured choice has been selected.	alternatives, of the ES[APP-070] describes the other options considered. The results of the Applicant's formal assessment, together with accumulated local knowledge and responses from the consultation exercise were passed on to Cadent to inform their ongoing draft scheme which is still in the earlier stages of design.
4.6.8	Applicants should consider taking independent professional advice on the design aspects of a proposal. In particular, the Design Council can be asked to provide design review for nationally significant infrastructure projects and applicants are encouraged to use this service. Applicants should also consider any design guidance developed by the local planning authority.	The Applicant held two design workshops with the Design Council on the 10th and 11th February 2021. Following the workshops, the Design Council provided the proposed scheme with constructive comments and opportunities which are discussed in paragraph 3.4.2 of the Design & Access Statement [APP-268]. The Applicant met with the Design Council again in November 2022 to present the finalised design and use the opportunity to discuss detailed design elements including materials.
4.6.10 and 4.6.11 -	Criteria for ‘’good design’’ for energy infrastructure In the light of the above and given the importance which the Planning Act 2008 places on good design and sustainability, the Secretary of State needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable, and adaptable (including taking account of natural hazards such as flooding) as they can be.	Appendix 5.2: Gas main diversion screening assessment [APP-097] sets out the likely significant effects identified along the preferred diversion corridor. The proposed scheme also carried out a supplementary consultation (Annex N [APP-062]) where five feasible corridors were presented to members of the local community and stakeholders for comment. The CftS [APP-249] sets out how the proposed scheme’s design evolved, whilst Chapter 3: Assessment of

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	In doing so, the Secretary of State should be satisfied that the applicant has considered both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located, any potential amenity benefits, and visual impacts on the landscape or seascape) as far as possible.	alternatives, of the ES [APP-070] describes the other options considered. The results of the Applicant's formal assessment, together with accumulated local knowledge and responses from the consultation exercise were passed on to Cadent to inform their ongoing draft scheme which is still in the earlier stages of design. In terms of functionality, the Applicant's choice of preferred corridor takes into account the physical and environmental constraints of the area and the proximity of an existing gas pipeline. The working width for the diverted pipeline corridor would be reduced as far as reasonably practicable through woodland and where the gas main diversion crosses hedgerow field boundaries. All main river crossing(s) would be installed using trenchless techniques, such as horizontal drilling. Directional drilling would be considered where practicable. Consideration of aesthetics and good design would consist of replanting along the easement of the gas main diversion and would be carried out in accordance with Cadent Gas guidance and best practice standards. Where woodland vegetation would be lost and trees could not be replaced in situ due to the restrictions of the pipeline easement, native shrub planting would be used in line with that guidance. Where tree lines and tree belts would be lost and could not be replaced due to the restrictions of pipeline easement, native hedgerow planting would be used in line with the guidance.

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4.7 Consideration of Combined Heat and Power (CHP)		
4.7.1	Combined Heat and Power (CHP) is the generation of usable heat and electricity in a single process. A CHP station may either supply steam direct to customers or capture waste heat for low-pressure steam, hot water, or space heating purposes after it has been used to drive electricity generating turbines. The heat can also be used to drive absorption chillers, thereby providing cooling	This section relates to new energy infrastructure and thus is not relevant to the gas main diversion or the proposed scheme.
4.8 Carbon Capture and Storage (CCS)		
4.8.1	CCS is a technology that enables carbon dioxide that would otherwise be released to the atmosphere to be captured and permanently stored. It can be applied to any large point source of carbon dioxide, such as thermal generating power stations or other industrial processes that are high emitters.	This section relates to new energy infrastructure and thus is not relevant to the gas main diversion or the proposed scheme.
4.9 Climate Change Adaptation		
4.9.5	In certain circumstances, measures implemented to ensure a scheme can adapt to climate change may give rise to additional impacts, for example as a result of protecting against flood risk, there may be consequential impacts on coastal change (see Section 5.6). In preparing measures to support climate change adaptation applicants should take reasonable steps to maximise the use of nature-based solutions alongside other conventional techniques.	None of the measures which have been proposed to reduce the vulnerability of the proposed scheme to potential climate change related impacts are considered to have the potential to result in consequential impacts over and above those already considered within the Environmental Statement to-date (e.g. as a result of the installation of attenuation ponds to mitigate for flood risk). Appendix 14.6: Surface Water Drainage Strategy [APP-174 to APP-179] identifies that the drainage design for the proposed scheme has been designed according to national

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		Sustainable Drainage Systems (SuDS) best practice, including the principles of Defra's (2015) Sustainable Drainage Systems, non-statutory technical standards for SuDs and DMRB CG 501 Design of Highway Drainage Systems.
4.9.8 and 4.9.9	Climate change adaption New energy infrastructure will typically be a long-term investment and will need to remain operational over many decades, in the face of a changing climate. Consequently, applicants must consider the direct (e.g. site flooding, limited water availability, storms, heatwave and wildfire threats to infrastructure and operations) and indirect (e.g. access roads or other critical dependencies impacted by flooding, storms, heatwaves or wildfires) impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure. The ES should set out how the proposal will take account of the projected impacts of climate change, using government guidance and industry standard benchmarks such as the Climate Change Allowances for Flood Risk Assessments, 142 Climate Impacts Tool, 143 and British Standards for climate change adaptation, 144 in accordance with the EIA Regulations. This information will be needed by the Secretary of State.	This section refers to new energy infrastructure and is thus of limited relevance to the gas main diversion or the proposed scheme. Although the gas main diversion will be a new pipeline, it is a like for like replacement. However, for completeness of the response, the design has been developed taking into account the potential implications of climate change such as resilience to flooding and high temperatures. As the pipeline is installed underground it will not increase flood risk but also being underground is protected from flooding events. The EIA process has considered the effects of possible future changes in climate over a 60-year appraisal period and potential impacts of these climatic changes have been assessed in Chapter 15: Climate, of the ES [APP-082]. The drainage design has been developed taking into account future potential increases in flooding, whilst the impacts have been considered in Appendix 14.5: FRA [APP-162]. The guidance on climate change allowances has been used (Environment Agency (2021) Flood risk assessments: climate change allowances). Mitigation measures with regards to climate change are secured in the Register of Environmental Actions and

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		Commitments (REAC)within the first iteration of the [APP-184].
4.9.10	Applicants should assess the impacts on and from their proposed energy project across a range of climate change scenarios, in line with appropriate expert advice and guidance available at the time.	The ES [APP-068- APP-085] approach is to provide an assessment of the proposed scheme design based on the realistic worst-case scenario afforded by the limits of deviation to be sought within the DCO application. This is therefore the maximum possible extent of the proposed scheme and as such has been assessed within the ES. The EIA screening exercise documented in Appendix 5.2 of the ES [APP-097] provides a desk based study of the area where the proposed gas main diversion is to be installed, reporting on possible significant effects on the environment.
4.9.11	Applicants should demonstrate that proposals have a high level of climate resilience built-in from the outset and should also demonstrate how proposals can be adapted over their predicted lifetimes to remain resilient to a credible maximum climate change scenario. These results should be considered alongside relevant research which is based on the climate change projections	the design has been developed taking into account the potential implications of climate change such as resilience to flooding and high temperatures. As the pipeline is installed underground it will not increase flood risk but also being underground is protected from flooding events. The EIA process has considered the effects of possible future changes in climate over a 60-year appraisal period and potential impacts of these climatic changes have been assessed in Chapter 15: Climate, of the ES [APP-082]. The drainage design has been developed taking into account future potential increases in flooding, whilst the impacts have been considered in Appendix 14.5: FRA [APP-162]. The guidance on climate change allowances has been used (Environment Agency (2021) Flood risk assessments: climate change allowances).

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		Mitigation measures with regards to climate change are secured in the Register of Environmental Actions and Commitments (REAC)within the first iteration of the Environmental Management Plan APP-184].
4.9.12	Where energy infrastructure has safety critical elements (for example parts of new gas-fired power stations or some electricity sub-stations), the applicant should apply a credible maximum climate change scenario. It is appropriate to take a risk-averse approach with elements of infrastructure which are critical to the safety of its operation.	There will be no natural gas storage associated with the gas main diversion works of the existing gas main and therefore it is considered that the COMAH Regulations 2015 do not apply. The diversion work will be carried out in accordance with all relevant health and safety legislation as detailed in 7.10 Design Principles [REP2-006].
4.11 Pollution Control and Other Environmental Regulatory Regimes		
4.11.6	Many projects covered by this NPS will be subject to the EP regime, which also incorporates operational waste management requirements for certain activities. When an applicant applies for an EP, the relevant regulator (usually EA or NRW but sometimes the local authority) requires that the application demonstrates that processes are in place to meet all relevant EP requirements.	Chapter 11: Material assets and waste, of the ES [APP-078] sets out how waste will be managed during construction and operation. It also details how the design of the proposed scheme would be built to reduce the consumption and disposal of waste and where practicable, the design of the proposed scheme would work towards the ambition of zero avoidable waste in construction. The proposed scheme would aim to maximise its use of recycled materials for construction where feasible. An outline Site Waste Management Plan (SWMP) has been prepared as part of the first iteration of the EMP [APP-184] to plan, implement, monitor and review waste reduction and management throughout the design and construction of the proposed scheme. The SWMP is a live document, updated at varying points during design and construction. It will be

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		used to quantify waste arisings and facilitate the identification and implementation of waste prevention at the detailed design stage, and the reuse, recycling and other recovery opportunities during the construction stage. The waste hierarchy will be followed as a priority to achieve the best overall environmental outcome, and limit waste generation and disposal to landfill in line with the prevailing national policy targets.
4.11.7	Applicants should make early contact with relevant regulators, including EA or NRW and the MMO, to discuss their requirements for EPs and other consents. Early contact with relevant regulators is strongly encouraged to ensure that applications take account of all relevant environmental considerations and that the relevant regulators are able to provide timely advice and assurance to the Secretary of State.	Liaison is ongoing with the Environment Agency, Essex County Council and Natural England to ensure that they are satisfied with good practice measures currently in place in the REAC within the EMP[APP-184], the Habitats Regulations Assessment No Significant Effects Report [APP-201] and the Appendices associated with Chapter 9: Biodiversity and Chapter 14 Road drainage and the water environment ES [APP-081].
4.11.12	Wherever possible, applicants should submit applications for EPs and other necessary consents at the same time as applying to the Secretary of State for development consent	The Consents, Licences and Agreements Position Statement [REP3-007] sets out National Highways' intended strategy for obtaining the consents and associated agreements needed to implement the proposed scheme. It details the applications that will be made on behalf of the proposed scheme to the Environment Agency and Essex County Council as the Lead Local Flood Authority.
4.12 Safety		
4.12.5	Applicants should consult with the HSE on matters relating to safety.	The HSE is a Prescribed Consultee listed in the Consultation Report [APP-045] Annex G List of Prescribed Consultees identified and consulted. The CftS [APP-249]

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		includes a gas main diversion statement explaining the characteristics of the pipeline, the need for its diversion and work done to identify possible routes and the CftS Appendices B, C, D, E – NNNPS and Energy Accordance Tables [APP-251] summarises regulatory aspects and corresponding scheme details related to pipeline safety. The Applicant has notified the HSE of the scheme in accordance with Statutory Requirements for notification of construction projects.
4.13 Hazardous Substance		
4.13.1	All establishments wishing to hold stocks of certain hazardous substances above a threshold need 'Hazardous Substances Consent.	This section refers to the storage of hazardous substances and so is not relevant to the proposed scheme or gas main diversion.
4.14 Common Law Nuisance and Statutory Nuisance		
4.14.5	At the application stage of an energy NSIP, possible sources of nuisance under section 79(1) of the EPA 1990 and how they may be mitigated or limited should be considered by the Secretary of State so that appropriate requirements can be included in any subsequent order granting development consent (see Section 5.7 on Dust, odour, artificial light etc. and Section 5.12 on Noise and vibration.	For the diverted length of the gas main sources of nuisance may occur during construction. The proposed scheme has prepared a number of mitigation measures as listed in the REAC, which is part of the first iteration of the EMP [APP-184] for the diverted length of the gas main diversion. The EMP also include measures to reduce noise, dust, odour and artificial light during the pipeline construction period. Appendix 5.2: Gas main diversion screening assessment [APP-097] sets out the likely significant effects identified along the preferred diversion corridor, which

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		reported no significant effect on air quality. In respect of emissions of odour and artificial light, these are not addressed in the ES as the proposed scheme
4.15.6	Where national security implications have been identified, the applicant should consult with relevant security experts from CPNI, ONR (for civil nuclear) and/or DESNZ to ensure security measures have been adequately considered in the design process and that adequate consideration has been given to the management of security risks.	No national security considerations have been identified for the gas main diversion.
5.2 Air Quality and Emissions		
5.2.7 and 5.28	Where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the ES. The ES should describe: • existing air quality levels and the relative change in air quality from existing levels; • any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project; • the predicted absolute emission levels of the proposed project, after mitigation methods have been applied; and	Baseline air quality conditions are described in Section 6.8 of Chapter 6: Air quality, of the ES [APP-073] and Appendix 6.1: Air quality monitoring results [APP-100]. Modelled air pollutant concentrations in the opening year (2027) DM and DS scenarios are presented and discussed in Section 6.9 of Chapter 6 and Appendix 6.5: Air quality results [APP-104]. Potential impacts, mitigation measures and the significance of residual effects, during both the construction and operational stage of the proposed scheme, are presented and discussed in sections 6.9, 6.10 and 6.11 of Chapter 6 respectively. Eutrophication is not relevant to the gas main diversion. Appendix 5.2: Gas main diversion screening assessment [APP-097] sets out the likely significant effects

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	• any potential eutrophication impacts.	identified along the preferred diversion corridor, which reported no significant effect on air quality.
5.2.9	Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts.	Emission factors derived from the Department for Environment, Food and Rural Affairs' (Defra's) Emission Factors Toolkit (EFT) (v10.0) (which contains the most recent projections up to 2030) have been used within the air quality assessment presented in Chapter 6: Air quality, of the ES [APP-073]. EFT (v11) has since been released but would have no implications for the air quality assessment owing to emission factors for NO_X and PM being identical up until 2030. The latest background pollutants maps and tools published on the Defra air quality assessment website were also used. No additional local fleet monitoring was undertaken in this assessment. Uncertainty in future fleet forecasts is addressed through modelling verification in Appendix 6.4: Verification of Dispersion Model Results, of the ES [APP-103] and by long-term trend adjustment factors discussed in Chapter 6: Air quality, of the ES [APP-073].
5.2.10	Where a proposed development is likely to lead to a breach of the air quality thresholds or affect the ability of a non-compliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan at the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those thresholds are not breached.	Chapter 6: Air quality, of the ES [APP-073] presents the results of the assessment of the impacts of the proposed scheme on air quality, in accordance with DMRB LA 105 and concludes that the effect of the proposed scheme on air quality at human health receptors, during both the construction and operational phases, is not considered to be significant. However, the assessment identified likely significant effects at ecological receptors owing to an

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		increase in nitrogen deposition, as outlined in Chapter 9: Biodiversity, of the ES [APP-076], where subsequent mitigation has been considered. Mitigation measures are secured in the REAC within the first iteration of the EMP [APP-185].
5.3 Greenhouse Gas Emissions		
5.3.4 - 5.3.7	All proposals for energy infrastructure projects should include a GHG assessment as part of their ES (See Section 4.2). This should include: • A whole life GHG assessment showing construction, operational and decommissioning GHG impacts. • An explanation of the steps that have been taken to drive down the climate change impacts at each of those stages. • Measurement of embodied GHG impact from the construction stage. • How reduction in energy demand and consumption during operation has been prioritised in comparison with other measures. • How operational emissions have been reduced as much as possible through the application of best available technology for that type of technology. • Calculation of operational energy consumption and associated carbon emissions.	Operational GHG emissions associated with the proposed scheme are set out in Table 15.22 of Chapter 15: Climate of the ES [APP-082]. These are compared to carbon budgets in Table 15.23 of Chapter 15: Climate of the ES [APP-082]. Whilst the proposed scheme is estimated to result in an increase in operational GHG emissions, primarily as a result of an increase in road user GHG emissions, the results in Table 15.23 indicate that estimated changes in GHG emissions as a result of the proposed scheme are negligible in comparison to relevant UK carbon budgets. On this basis, GHG emissions associated with the proposed scheme are considered unlikely to have a material impact on the ability of the UK Government to meet its carbon reduction targets and are therefore considered to be 'not significant', in line with DMRB LA 114 and the existing NNNPS. As demonstrated in Table 15.24 of Chapter 15: Climate of the ES [APP-082], however, the implementation of the Transport Decarbonisation Plan (as described in Chapter 2 of the draft NNNPS) will result in substantially lower operational phase GHG emissions and changes in

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	• Whether and how any residual GHG emissions will be (voluntarily) offset or removed using a recognised framework. • Where there are residual emissions, the level of emissions and the impact of those on national and international efforts to limit climate change, both alone and where relevant in combination with other developments at a regional or national level, or sector level, if sectoral targets are developed. A GHG assessment should be used to drive down GHG emissions at every stage of the proposed development and ensure that emissions are minimised as far as possible for the type of technology, taking into account the overall objectives of ensuring our supply of energy always remains secure, reliable and affordable, as we transition to net zero. Applicants should look for opportunities within the proposed development to embed nature-based or technological solutions to mitigate or offset the emissions of construction and decommissioning. Steps taken to minimise and offset emissions should be set out in a GHG Reduction Strategy, secured under the development consent order. The GHG Reduction Strategy should consider the creation and preservation of carbon stores and sinks including through woodland creation, peatland restoration and through other natural habitats.	operational phase GHG emissions than presented in Table 15.23 in future years.
5.4 Biodiversity and Geological Conservation		

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5.4.17	Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance (including those outside England), on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats.	Chapter 9: Biodiversity, of the ES [APP-076] identifies Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites where the proposed scheme: • is within 2km of a Ramsar site or European site or functionally linked land • is within 30km of an SAC, where bats are noted as one of the qualifying interests • crosses or lies adjacent to, upstream of, or downstream of, a watercourse which is designated in part or wholly as a Ramsar site or European site • has a potential hydrological or hydrogeological linkage to a Ramsar site or European site containing a groundwater-dependent terrestrial ecosystem • has an Affected Road Network within 200m of a Ramsar site or European site • will have a direct pathway to effects Chapter 9: Biodiversity [APP-076] of the ES and the Habitats Regulations Assessment No Significant Effects Report [APP-201] also clearly outline likely significant effects on internationally, nationally and locally designated sites of ecological conservation importance, on protected species, and on habitats and other species identified as being of principal importance for the conservation of

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		biodiversity. Chapter 9 considers the full range of potential impacts on ecosystems. The first iteration of the EMP [APP-184] includes specific management plans that will ensure construction related mitigation measures and actions set out in the REAC (part of the EMP) are successfully implemented onsite. The specific management documents to support the EMP in terms of managing impacts on biodiversity and habitats are as follows: • Landscape and Ecology Management Plan (Appendix I) • Invasive Species Management Plan (Appendix H)
5.4.19	The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.	Design changes have been implemented where practicable to avoid impacts to ecological receptors. These are discussed within Section 9.10 of Chapter 9: Biodiversity and Chapter 3: Assessment of alternatives, of the ES [APP-070]. Furthermore, the approach of maximising biodiversity delivery is being applied to the proposed scheme as discussed in Section 9.13 of Chapter 9 [APP-076] and Appendix 9.14: Biodiversity Net Gain Report, of the ES [APP-138]. The single geological SSSI has been scoped out of Chapter 10: Geology and soils, of the ES [APP-077].
5.4.20	Applicants should consider wider ecosystem services and benefits of natural capital when designing enhancement measures.	While the biodiversity assessment as presented in Chapter 9: Biodiversity [APP-076] does not explicitly include a natural capital or ecosystem services assessment, impacts on habitats and species have been considered in the

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		context of maintaining connectivity, maximising biodiversity delivery and the retention of sensitive ecological features, as demonstrated by the habitat net gains as stated above.
5.4.21	As set out in Section 4.6, the design process should embed opportunities for nature inclusive design. Energy infrastructure projects have the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in wider environmental gains (see Section 4.5 on Environmental and Biodiversity Net Gain). The scope of potential gains will be dependent on the type, scale, and location of each project.	Both embedded and standard mitigation measures are detailed in Section 15.10 of Chapter 15: Climate, of the ES [APP-082] and secured within the first iteration of the EMP [APP-184]. The mitigation measures set out the proposed scheme's impact on greenhouse gas emissions and the proposed scheme's vulnerability to climate change for its construction and operational phases.
5.4.22	The design of Energy NSIP proposals will need to consider the movement of mobile / migratory species such as birds, fish and marine and terrestrial mammals and their potential to interact with infrastructure. As energy infrastructure could occur anywhere within England and Wales, both inland and onshore and offshore, the potential to affect mobile and migratory species across the UK and more widely across Europe (transboundary effects) requires consideration, depending on the location of development.	The proposed scheme has taken into account the locations of valuable and priority habitats, including important connective habitats (i.e. hedgerows, watercourses and treelines) and the location of protected species. The mitigation hierarchy has been followed to modify the design to avoid impacts to these features where practicable. In addition, opportunities to enhance biodiversity have been proposed. Mitigation and enhancement measures are described within Section 9.10 of Chapter 9: Biodiversity, of the ES [APP-076].
Habitats Regulations		
5.4.25	The applicant should seek the advice of the appropriate SNCB and provide the Secretary of State with such information as the Secretary of State may reasonably require, to determine whether an Appropriate Assessment (AA) is required. Applicants can request and agree 'Evidence Plans' with SNCBs, which is a way to agree and record upfront the	The Habitats Regulations Assessment No Significant Effects Report [APP-201] is included within the DCO application. This considers whether the proposed scheme has the potential to result in significant effects on European sites of biodiversity interest. The Habitats Regulations Assessment (HRA) concludes that no likely significant

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	information the applicant needs to supply with its application, so that the HRA can be efficiently carried out. If an AA is required, the applicant must provide the Secretary of State with such information as may reasonably be required to enable the Secretary of State to conduct the AA. This should include information on any mitigation measures that are proposed to minimise or avoid likely significant effects	effects on any European sites are anticipated, when considered alone or in-combination with other plans and projects. It is therefore not considered relevant for an Evidence Plan to be produced for the proposed scheme.
Ancient woodland, veteran trees and other irreplaceable habitats		
5.4.32	Applicants should include measures to mitigate the direct and indirect effects of development on ancient woodland, veteran trees or other irreplaceable habitats during both construction and operational phase.	Chapter 9: Biodiversity, of the ES [APP-076] details that the proposed scheme would not directly impact any areas of Ancient Woodland. Perry's Wood is located within 200m of the Affected Road Network and has been assessed for impacts from changes in air quality. The air quality assessment has shown there would be changes in air quality at one veteran tree, four potential veteran trees and one potential ancient tree during construction and changes in air quality for six verified veteran trees, 16 potential veteran trees and one ancient tree during operation. There would also be a change in air quality for one Ancient Woodland/Local Wildlife Site (Perry's Wood). The assessment in Appendix 9.15: : Assessment of Air Quality Impacts on Ecology Receptors [APP-139] and Chapter 9: Biodiversity, of the ES [APP-076], concludes that there would be no significant effect on the veteran or ancient trees (verified and potential). Chapter 9 of the ES does conclude there would be a significant effect on Perry's Wood Local Wildlife Site, which is valued of national importance due to its designation as ancient woodland. It is

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		not possible to mitigate this impact, but compensation would be provided in the form of new woodland planting within borrow pit F. No verified veteran trees would be directly impacted by construction of the proposed scheme. However, five potential veteran trees (i.e. trees not formally designated but assessed as part of A12 field surveys to be of sufficient quality to qualify as veteran trees) would be removed during construction. Where practicable, the design of the proposed scheme was refined to avoid impacts, but loss of these five trees is unavoidable. Where potential ancient and veteran trees are unavoidably removed to accommodate the proposed scheme, their loss would be partially compensated (acknowledging that features such as ancient and veteran trees are considered irreplaceable and therefore cannot be fully compensated) as per the latest guidance from Natural England and the Forestry Commission (2022): • Young trees of the same species as that which is removed would be planted with sufficient space around them to encourage development of an open crown. • Where practicable, trees would be planted close to the trees they are replacing, taking into account post-construction air quality levels. Where practicable and safe to do so, the intact hulk of the potential ancient or veteran tree would be left where it is (preferably standing) to benefit invertebrates and fungi. Where this is not possible, the hulk would be moved near to

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		other unimpacted potential ancient or veteran trees or parkland in the area as show on Figure 2.1: Environmental Masterplan, of the ES [APP-086 – APP-088].
Protection and enhancement of habitats and other species		
5.4.33 - 5.4.34	Applicants should consider any reasonable opportunities to maximise the restoration, creation, and enhancement of wider biodiversity, and the protection and restoration of the ability of habitats to store or sequester carbon as set out under Section 4.5. Consideration should be given to improvements to, and impacts on, habitats and species in, around and beyond developments, for wider ecosystem services and natural capital benefits, beyond those under protection and identified as being of principal importance. This may include considerations and opportunities identified through Local Nature Recovery Strategies, and national goals and targets set through the government's strategy for nature for example.	The Applicant has sought to maximise biodiversity delivery, with the proposed scheme forecasting an overall net gain of 25% for habitats, 36% for hedgerows and 157% for rivers (Table 9.32 of Chapter 9 Biodiversity [APP-076]) on-site post-construction. This includes habitat retention, creation and enhancement. One example of seeking enhancement opportunities relates to hedgerows, whereby a detailed assessment identified 45 hedgerows across the proposed scheme with potential for enhancement. The aim would therefore be to increase their overall condition, with the added benefit of improving diversity for the species they support and connectivity across the landscape (paragraph 9.10.121 of Chapter 9 [APP-076]). Full details of proposed enhancements are provided in Section 9.10 of Chapter 9 [APP-076].
5.4.35	Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the proposed development. In particular, the applicant should demonstrate that: • during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works	The proposed scheme has taken into account the locations of valuable and priority habitats, including important connective habitats (i.e. hedgerows, watercourses and treelines) and the location of protected species. The mitigation hierarchy has been followed to modify the design to avoid impacts to these features where practicable. In addition, opportunities to enhance biodiversity have been proposed. Mitigation and enhancement measures are

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	• the timing of construction has been planned to avoid or limit disturbance • during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements • habitats will, where practicable, be restored after construction works have finished • opportunities will be taken to enhance existing habitats rather than replace them, and where practicable, create new habitats of value within the site landscaping proposals. Where habitat creation is required as mitigation, compensation, or enhancement the location and quality will be of key importance. In this regard habitat creation should be focused on areas where the most ecological and ecosystems benefits can be realised.	described within Section 9.10 of Chapter 9: Biodiversity, of the ES [APP-076]. Embedded and standard mitigation measures are detailed within Chapter 9: Biodiversity, of the ES [APP-076]. Impacts would be limited by reducing the construction footprint as far as practicable, through following standard mitigation, through landscape design and through provision of enhancements where practicable.
5.4.36	Applicants should produce and implement a Biodiversity Management Strategy as part of their development proposals. This could include provision for biodiversity awareness training to employees and contractors so as to avoid unnecessary adverse impacts on biodiversity during the construction and operation stages.	The DCO submission for the Proposed Scheme includes a first iteration Environmental Management Plan [REP4-022], which contains a Landscape and Ecology Management within Appendix I [APP-193]. In accordance with commitment GN1 of the Register of Environmental Actions and Commitments [REP4-023] a second iteration Environmental Management Plan (EMP) would be prepared and approved by the Secretary of State for Transport prior to commencement of any works. The second iteration EMP would detail the measures that shall be undertaken prior to,

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		and during construction of the proposed scheme. The construction of the proposed scheme must be carried out in accordance with the approved second iteration EMP. The second iteration EMP must be based on, and incorporate, the requirements of the first iteration EMP [REP4-022] and shall include the implementation of industry standard practice and control measures for environmental impacts arising during construction. The second iteration EMP would incorporate (as a minimum) and adhere to the supporting management plans presented within the first iteration EMP [REP4-22]. These plans include a Landscape and Ecology Management Plan.
5.4.42 and 5.4.43	As a general principle, and subject to the specific policies below, development should, in line with the mitigation hierarchy, aim to avoid significant harm to biodiversity and geological conservation interests, including through consideration of reasonable alternatives (as set out in Section 4.2 above). Where significant harm cannot be avoided, impacts should be mitigated and as a last resort, appropriate compensation measures should be sought. If significant harm to biodiversity resulting from a development cannot be avoided (for example through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then the Secretary of State will give significant weight to any residual harm and consent may be refused.	Design changes have been implemented where practicable to avoid impacts to ecological receptors. These are discussed within Section 9.10 of Chapter 9: Biodiversity and Chapter 3: Assessment of alternatives, of the ES [APP-070]. Furthermore, the approach of maximising biodiversity delivery is being applied to the proposed scheme as discussed in Section 9.13 of Chapter 9 and Appendix 9.14: Biodiversity Net Gain report [APP-076]. The single geological SSSI has been scoped out of Chapter 10: Geology and soils, of the ES [APP-077] Sections 9.9 to 9.11 of Chapter 9: Biodiversity, and Sections 10.9 to 10.11 of Chapter 10: Geology and Soils, of the ES [APP-077 detail impacts, mitigation.

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		Sections 9.9 to 9.11 of Chapter 9: Biodiversity, and Sections 10.9 to 10.11 of Chapter 10: Geology and Soils, of the ES [APP-078] detail impacts, mitigation and significant effects to ecological receptors such that the Secretary of State can be informed in the decision-making process. The first iteration of the EMP [APP-184] includes all mitigation measures from the chapters.
5.5 Civil and Military Aviation and Defence Interests		
5.5.1	All aerodromes, covering civil and military activities, as well as aviation technical sites, meteorological radars and other types of defence interests (both onshore and offshore) can be affected by new energy development.	This section refers to civil and military aviation and other defence interests and as such is not relevant to the gas main diversion or the proposed scheme.
5.6 Coastal Change		
5.6.2	The government's aim is to ensure that our coastal communities continue to prosper and adapt to coastal change. This means planning should: • ensure that policies and decisions in coastal areas are based on an understanding of coastal change over time • prevent new development from being put at risk from coastal change by: i. avoiding inappropriate development in areas that are vulnerable to coastal change or any development that adds to the impacts of physical changes to the coast	This section refers to coastal change and as such is not relevant to the gas main diversion or the proposed scheme.

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	ii. directing development away from areas vulnerable to coastal change • ensure that the risk to development which is, exceptionally, necessary in coastal change areas because it requires a coastal location and provides substantial economic and social benefits to communities, is managed over its planned lifetime • ensure that plans are in place to secure the long-term sustainability of coastal areas	
5.7 Dust, Odour, Artificial Light, Smoke, Steam, and Insect Infestation		
5.7.5 and 5.7.6	The applicant should assess the potential for insect infestation and emissions of odour, dust, steam, smoke, and artificial light to have a detrimental impact on amenity, as part of the ES. In particular, the assessment provided by the applicant should describe: • the type, quantity and timing of emissions • aspects of the development which may give rise to emissions • premises or locations that may be affected by the emissions • effects of the emission on identified premises or locations	A gas main diversion screening assessment Appendix 5.2 of the ES [APP-097] was prepared and no likely significant environmental effects were identified on Air Quality, Noise and Vibration, or Geology and Soils. As discussed in Chapter 6: Air quality, of the ES [APP-073] there is the potential for dust effects during the construction phase at sensitive receptors within the distance bands outlined in the DMRB LA 105. These are shown on Figure 6.4 Construction Dust Assessment Sensitive Receptors Sheet 1 to 4 [APP-208]. The level and distribution of construction dust emissions will depend on where within the Order Limits the dust raising activity takes place, the nature of the activity and controls, and weather conditions. Chapter 6 also shows the number of receptors within the distance bands outlined in the DMRB LA 105. Based on the number of receptors within the distance bands and the large

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	• measures to be employed in preventing or mitigating the emissions	potential for dust emissions to occur, the construction dust risk is considered to be 'high'. This is in accordance with DMRB LA 105 Tables 2.58a and 2.58b. As outlined in the methodology, standard mitigation measures in line with this level of risk have been detailed within the first iteration of the EMP [APP-184]. In terms of the proposed scheme's impact on artificial light, the landscape and visual impact assessment in Chapter 8: Landscape and visual, of the ES [APP-075] considers the significance of effect of both day and night-time changes for landscape and visual receptors in line with the requirements of DMRB LA 107. The assessment considers the effects of construction lighting, highway lighting and vehicle lights, and identifies the potential for temporary lighting to have an impact. This will be mitigated by the use of sensitive lighting design as outlined in Section 8.10 of Chapter 8. In respect of emissions of odour, smoke, steam and insect infestation; these are not addressed in the ES as they are not affected by the gas main diversion.
5.7.7	The applicant is advised to consult the relevant local planning authority and, where appropriate, the EA about the scope and methodology of the assessment.	Table 6.6 of Chapter 6: Air quality, of the ES [APP-073] presents the summary of air quality scope of which construction dust was scoped in. Paragraph 6.5.15 outlines the methodology followed for this assessment. It is also noted that more information has been included in the First Iteration Environmental Management Plan - Appendix E: Dust Management Plan [APP-189]. The assessment of odour was not scoped in for assessment during construction or operation.

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5.8 Flood Risk		
5.8.14 and 5.8.15	A site-specific flood risk assessment should be provided for all energy projects in Flood Zones 2 and 3 in England or Zones B and C in Wales. In Flood Zone 1 in England or Zone A in Wales, an assessment should accompany all proposals involving: • sites of 1 hectare or more • land which has been identified by the EA or NRW as having critical drainage problems • land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in future • land that may be subject to other sources of flooding (for example surface water) • where the EA or NRW, Lead Local Flood Authority, Internal Drainage Board or other body have indicated that there may be drainage problems. This assessment should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account	Appendix 14.5: FRA [APP-162] assesses the impact to and from the gas main diversion and the proposed scheme on all sources of flood risk and commits to mitigation. The FRA does not separately assess the flood risk of the gas main division in isolation, but rather assess the impact on both the road element of the proposed scheme and the gas main diversion together. This is as detailed within Chapter 14: Road drainage and water environment, of the ES [APP-081] and mitigation measures are included in REAC within the first iteration of the EMP [APP-184]. The mitigation would ensure that together the gas main diversion and the proposed scheme do not increase flood risk and are safe for their respective lifetimes including the predicted impact of climate change.
5.8.15	The minimum requirements for Flood Risk Assessments (FRA) are that they should:	Appendix 14.5: Flood Risk Assessment (FRA) [APP-162] assesses the impact to and from the proposed scheme on

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	• be proportionate to the risk and appropriate to the scale, nature and location of the project; • consider the risk of flooding arising from the project in addition to the risk of flooding to the project; • take the impacts of climate change into account, across a range of climate scenarios, clearly stating the development lifetime over which the assessment has been made. • be undertaken by competent people, as early as possible in the process of preparing the proposal; • consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure and exceedance; • consider the vulnerability of those using the site, including arrangements for safe access and escape; • consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and include information on flood likelihood, speed-of-onset, depth, velocity, hazard and duration; • identify and secure opportunities to reduce the causes and impacts of flooding overall, making as much use as possible of natural flood management techniques as	all sources of flood risk and commits to embedded and essential mitigation to manage flood risk, taking into account the residual risk, concluding that the proposed scheme would be acceptable and not result in unacceptable levels of flooding or increase flooding elsewhere. The FRA has sufficiently demonstrated accordance with Sequential and Exception Tests as appropriate. The FRA and Chapter 15: Climate, of the ES [APP-082] takes into account the impact of climate change and the proposed scheme's long-term impact on climate and the UK Government's Carbon Budget. Chapter 15 also considers the proposed scheme's vulnerability to climate change. This is as detailed within Chapter 14: Road drainage and the water environment, of the ES [APP-081], and mitigation measures are included in the REAC within the first iteration of the EMP [APP-185]. The FRA assumes a 100-year lifetime for the proposed scheme and incorporates the predicted impact of climate change upon flood risk. This is based on UKCP09 and UKCP18 projections as transposed into allowances by the Environment Agency. The proposed scheme has been classified as essential infrastructure in accordance with Annex 3: Flood risk vulnerability classification, of the National Planning Policy Framework, which is documented in the FRA. The FRA assesses the risk of flooding to the proposed scheme and demonstrates that it will remain safe for users for its

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	part of an integrated approach to flood risk management; • consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes; • include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that these risks can be safely managed, ensuring people will not be exposed to hazardous flooding; • consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems…	lifetime. The FRA also discusses the operation of the proposed scheme during a worst case flood event.
5.8.18	Development (including construction works) will need to account for any existing watercourses and flood and coastal erosion risk management structures or features, or any land likely to be needed for future structures or features so as to ensure • Access, clearances and sufficient land are retained to enable their maintenance, repair, operation, and replacement, as necessary • Their standard of protection is not reduced • Their condition or structural integrity is not reduced	The gas main diversion would be below ground and therefore drainage and flood risk implications are limited. The potential effect of the diversion on groundwater is discussed in Section 7 of the Groundwater Assessment, Appendix 14.4 [APP-161]. As the diversion is below ground, no permanent drainage is required solely for the gas main diversion. During construction of the diversion, there is a risk that floodplain capacity could be impacted by the works. Measures to ensure no increase in flood risk as a result of the construction of the proposed scheme are discussed in Section 7 of the FRA, Appendix 14.5 [APP-162].

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5.8.18 – 5.8.20	Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions before the official pre-application stage of the NSIP process with the EA or NRW, and, where relevant, other bodies such as Lead Local Flood Authorities, Internal Drainage Boards, sewerage undertakers, navigation authorities, highways authorities and reservoir owners and operators. Such discussions should identify the likelihood and possible extent and nature of the flood risk, help scope the FRA, and identify the information that will be required by the Secretary of State to reach a decision on the application when it is submitted. The Secretary of State should advise applicants to undertake these steps where they appear necessary but have not yet been addressed. If the EA, NRW or another flood risk management authority has reasonable concerns about the proposal on flood risk grounds, the applicant should discuss these concerns with the EA or NRW and take all reasonable steps to agree ways in which the proposal might be amended, or additional information provided, which would satisfy the authority's concerns.	Discussions have taken place during development of the proposed scheme regarding likely requirements for environmental permits with the Environment Agency, and regarding ordinary watercourse consents with Essex County Council as the Lead Local Flood Authority. This is documented in Chapter 14: Road drainage and the water environment, of the ES [APP-081]. Statements of Common Ground between the Applicant and the Environment Agency [REP2-008] and Essex County Council [REP2-018] were submitted at Deadline 2, detail the applications for consents and permits that would be made between the Applicant and respective parties.
5.8.21 - 5.8.22	The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. Where it is not possible to locate development in low-risk areas, the Sequential Test should go on to compare reasonably available sites with medium risk	A flood risk Sequential Test has been carried out and is reported within Appendix 14.5: Flood Risk Assessment, of the ES [APP-162]. Subsequently, an Exception Test was required, the results of which show that the proposed scheme passes the requirements of the test.

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	areas and then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas. The technology specific NPSs set out some exceptions to the application of the Sequential Test. However, when seeking development consent on a site allocated in a development plan through the application of the Sequential Test, informed by a strategic flood risk assessment, applicants need not apply the Sequential Test, provided the proposed development is consistent with the use for which the site was allocated and there is no new flood risk information that would have affected the outcome of the test.	
5.8.26 – 5.8.27	Site layout and surface water drainage systems should cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without adverse impacts. The surface water drainage arrangements for any project should, accounting for the predicted impacts of climate change throughout the development's lifetime, be such that the volumes and peak flow rates of surface water leaving the site are no greater than the rates prior to the proposed project, unless specific off-site arrangements are made and result in the same net effect.	Appendix 14.6: Surface Water Drainage Strategy [APP-174 to APP-179] identifies that the drainage design for the proposed scheme has been designed according to national SuDs best practice, including the principles of Defra's (2015) Sustainable Drainage Systems, non-statutory technical standards for SuDs and DMRB CG 501 Design of Highway Drainage Systems. In addition, the drainage design has been developed taking into account future potential increases in flooding and as informed by the climate change allowances (Environment Agency (2021) Flood risk assessments: climate change allowances). Chapter 9: Biodiversity, of the ES [APP-076] identifies that the design of the proposed scheme includes the provision of 71 attenuation ponds to mitigate for flood risk and enable road runoff to be treated prior to discharge into receiving

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		watercourses. Attenuation ponds will be refined at the detailed design stage to ensure they are sympathetic to wildlife.
5.8.28	It may be necessary to provide surface water storage and infiltration to limit and reduce both the peak rate of discharge from the site and the total volume discharged from the site. There may be circumstances where it is appropriate for infiltration facilities or attenuation storage to be provided outside the project site, if necessary through the use of a planning obligation	The design includes SuDS measures including ponds to store and attenuate the additional runoff that would result from the proposed scheme. Outflows from the ponds would be restricted to ensure no increase in flood risk to other parties. The assessment of ground conditions indicates that infiltration of runoff from the proposed scheme is unlikely to be viable due to low rates of percolation.
5.8.30 & 5.8.33	Where a development may result in an increase in flood risk elsewhere through the loss of flood storage, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided. The applicant should take advice from the local authority emergency planning team, emergency services and, where appropriate, from the local resilience forum when producing an evacuation plan for a manned energy project as part of the FRA. Any emergency planning documents, flood warning and evacuation procedures that are required should be identified in the FRA.	The Flood Risk Assessment (FRA)(APP-162) for the proposed scheme demonstrates how the scheme avoids an increase in flood risk elsewhere. The FRA also documents the areas where the proposed scheme would reduce the risk of flooding, including to property and the A12. The FRA also demonstrates how the design of the proposed scheme and mitigation included within it, would ensure that the proposed scheme would remain safe and operational in flood events up to a 1% Annual Exceedance Probability (AEP) event plus allowance for climate change.
5.8.35	Flood resistant and resilient materials and design should be adopted to minimise damage and speed recovery in the event of a flood.	The proposed scheme considers the risk of flooding to the scheme to ensure its resilience for its lifetime, as reported in the Flood Risk Assessment (APP-162).
5.9 Historic Environment		

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5.9.9	The applicant should undertake an assessment of any likely significant heritage impacts of the proposed development as part of the EIA and describe these in the ES (see Section 4.2). This should include consideration of heritage assets above, at, and below the surface of the ground. Consideration will also need to be given to the possible impacts, including cumulative, on the wider historic environment. The assessment should include reference to any historic landscape or seascape character assessment and associated studies as a means of assessing impacts relevant to the proposed project.	An assessment has been undertaken to identify likely significant heritage impacts from the proposed scheme and appropriate mitigation measures. The methodology and findings of the assessment are presented in Chapter 7: Cultural Heritage, of the ES [APP-074]. Non-designated cultural heritage assets have been identified through desk-based studies in Appendix 7.1: Cultural Heritage Gazetteer, Appendix 7.2: Cultural Heritage Desk Based Assessment, Appendix 7.3: Palaeolithic Desk Based Assessment and Appendix 7.4: Aerial Investigation and Mapping Report [APP-109], supplemented by a programme of non-intrusive and intrusive field evaluation reported in Appendices 7.5 and 7.6: Geophysical Survey Phase 1 and 2, and 7.7: Archaeological Trial Trenching Report [APP-110-114]. Consultation has also been carried out with Historic England to gain their views and guidance. The gas main diversion will not have a direct impact on any Scheduled Ancient Monuments but has the potential to remove remains associated with one non-designated archaeological site (Asset 349).
5.9.10	As part of the ES the applicant should provide a description of the significance of the heritage assets affected by the proposed development, including any contribution made by their setting. The level of detail should be proportionate to the importance of the heritage assets and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the applicant should have consulted the relevant Historic Environment Record (or, where	An assessment has been undertaken to identify likely significant heritage impacts from the proposed scheme and appropriate mitigation measures. The methodology and findings of the assessment are presented in Chapter 7: Cultural Heritage, of the ES [APP-074]. Non-designated cultural heritage assets have been identified through desk-based studies in Appendix 7.1: Cultural Heritage Gazetteer, Appendix 7.2: Cultural Heritage Desk Based Assessment,

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	the development is in English or Welsh waters, Historic England or Cadw) and assessed the heritage assets themselves using expertise where necessary according to the proposed development's impact	Appendix 7.3: Palaeolithic Desk Based Assessment and Appendix 7.4: Aerial Investigation and Mapping Report [APP-106-109], supplemented by a programme of non-intrusive and intrusive field evaluation reported in Appendices 7.5 and 7.6: Geophysical Survey Phase 1 and 2, and 7.7: Archaeological Trial Trenching Report [[APP-110-114]. Consultation has also been carried out with Historic England to gain their views and guidance.
5.9.11	Where a site on which development is proposed includes, or the available evidence suggests it has the potential to include, heritage assets with an archaeological interest, the applicant should carry out appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation. Where proposed development will affect the setting of a heritage asset, accurate representative visualisations may be necessary to explain the impact.	An assessment has been undertaken to identify likely significant heritage impacts from the proposed scheme and appropriate mitigation measures. The methodology and findings of the assessment are presented in Chapter 7: Cultural Heritage, of the ES [APP-074]. Non-designated cultural heritage assets have been identified through desk-based studies in Appendix 7.1: Cultural Heritage Gazetteer, Appendix 7.2: Cultural Heritage Desk Based Assessment, Appendix 7.3: Palaeolithic Desk Based Assessment and Appendix 7.4: Aerial Investigation and Mapping Report [APP-106-109], supplemented by a programme of non-intrusive and intrusive field evaluation reported in Appendices 7.5 and 7.6: Geophysical Survey Phase 1 and 2, and 7.7: Archaeological Trial Trenching Report [[APP-110-114]. Consultation has also been carried out with Historic England to gain their views and guidance. The gas main diversion will not have a direct impact on any Scheduled Ancient Monuments but has the potential to

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		remove remains associated with one non-designated archaeological site (Asset 349).
5.9.12	The applicant should ensure that the extent of the impact of the proposed development on the significance of any heritage assets affected can be adequately understood from the application and supporting documents. Studies will be required on those heritage assets affected by noise, vibration, light and indirect impacts, the extent and detail of these studies will be proportionate to the significance of the heritage asset affected	An assessment has been undertaken to identify likely significant heritage impacts from the proposed scheme and appropriate mitigation measures. The methodology and findings of the assessment are presented in Chapter 7: Cultural Heritage, of the ES [APP-074]. Non-designated cultural heritage assets have been identified through desk-based studies in Appendix 7.1: Cultural Heritage Gazetteer, Appendix 7.2: Cultural Heritage Desk Based Assessment, Appendix 7.3: Palaeolithic Desk Based Assessment and Appendix 7.4: Aerial Investigation and Mapping Report [APP-106- 109], supplemented by a programme of non-intrusive and intrusive field evaluation reported in Appendices 7.5 and 7.6: Geophysical Survey Phase 1 and 2, and 7.7: Archaeological Trial Trenching Report [APP-110-114]. Consultation has also been carried out with Historic England to gain their views and guidance. The gas main diversion will not have a direct impact on any Scheduled Ancient Monuments but has the potential to remove remains associated with one non-designated archaeological site (Asset 349).
5.9.13	The applicant is encouraged, where opportunities exist, to prepare proposals which can make a positive contribution to the historic environment, and to consider how their scheme takes account of the significance of heritage assets affected. This can include, where possible:	The details of the design alternatives that have been considered, including the environmental factors which have influenced the decision making, are provided in Chapter 3: Assessment of alternatives, of the Environmental Statement [TR010060/APP/6.1]. Embedded heritage mitigation within the proposed scheme include the following:

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	• enhancing, through a range of measures such a sensitive design, the significance of heritage assets or setting affected • considering where required the development of archive capacity which could deliver significant public benefits • considering how visual or noise impacts can affect heritage assets, and whether there may be opportunities to enhance access to, or interpretation, understanding and appreciation of, the heritage assets affected by the scheme.	• Realigning the proposed bypass between junctions 22 (Colemans interchange) and 23 (Kelvedon South interchange) has reduced the impact on the setting of the Rivenhall Long Mortuary Enclosure Scheduled Monument (Asset 399). • Construction of new infrastructure has been avoided in locations with sensitive built heritage assets as far as practicable. Examples include realigning the offline section of road between junctions 22 and 23 which has reduced the impact on the setting of the grade II* listed Hole Farm at Rivenhall End (Asset 420) and aligning the road between junctions 24 (Kelvedon North interchange) and 25 (Marks Tey interchange) in order to avoid the grade II listed Doggets Hammer Farm at Marks Tey (Asset 795). • The location and extent of borrow pits has been designed to avoid areas of Palaeolithic archaeological potential wherever practicable. • Junction locations have been revised to reduce impacts on the setting of heritage assets; for example, the proposed new junction 24 was moved from a position just south of the existing junction 24 to a new location to the west of Inworth Road, thereby reducing potential impacts on the grade II listed Prested Hall (Asset 730). • Inclusion of acoustic bunds and low noise road surfaces to reduce the effects of traffic noise on the

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		settings of sensitive built heritage receptors during the operational phase. Details of these measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1]. • Alignment of the proposed scheme and location of junctions and borrow pits designed to reduce landscape and visual effects. • Lighting limited to junctions and side roads and designed to best practice to reduce light spill. Use of light-emitting diode luminaires which use less energy than conventional luminaires, while reducing light spill into adjacent areas. • Planting to reduce adverse landscape and visual effects, including native hedgerows, shrubs and trees (as described in Chapter 8: Landscape and visual [TR010060/APP/6.1], and shown on Figure 2.1: Environmental Masterplan [TR010060/APP/6.2]. Consideration of the species, pattern and distribution of proposed hedgerows, shrubs and trees along the proposed scheme to reflect the distinctive local character of vegetation within the adjacent landscape and provide screening for visual receptors. • Native tree and shrub planting on and adjacent to highway earthworks to create woodlands, copses and shelterbelts in order to break up the scale of the road, screen structures, traffic, and lighting and help

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		integrate the proposed scheme into the existing landscape pattern. • The proposed scheme is likely to generate considerable new archaeological information and provide an opportunity for communicating such finds to the wider public. Enhancement will include interpretation of archaeological information through the reported fieldwork results. Appropriate outreach and engagement opportunities for the proposed scheme would be identified throughout the construction and operational phases of the proposed scheme and could include activities such as presentations, scientific outreach activities at local schools, volunteering programmes, media coverage, web-based initiatives, information and progress signage at appropriate locations, and permanent heritage interpretation at relevant sites, such as the Kelvedon Warrior (Asset 657), Rivenhall Long Mortuary Enclosure Scheduled Monument (Asset 399) and Prested Hall (Asset 730).
5.9.14	Careful consideration in preparing the scheme will be required on whether the impacts on the historic environment will be direct or indirect, temporary, or permanent.	A Cultural Heritage assessment has been undertaken to identify likely significant heritage impacts from the proposed scheme, including the type of impact (direct or indirect) and duration of impacts (temporary or permanent) together with appropriate mitigation measures. The methodology and findings of the assessment are presented in Chapter 7: Cultural Heritage, of the ES [APP-074]. The gas main diversion will not have a direct impact on any Scheduled

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		Ancient Monuments, Listed Buildings or Conservation Areas, Registered Parks and Gardens or World Heritage Sites but has the potential to remove remains associated with one non-designated archaeological site (Asset 349).
5.9.15	Applicants should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.	The proposed scheme has included the following methods to preserve those elements of heritage assets which make a positive contribution to their significance: • Construction of new infrastructure has been avoided in locations with sensitive built heritage assets as far as practicable. Examples include realigning the offline section of road between junctions 22 and 23 which has reduced the impact on the setting of the grade II* listed Hole Farm at Rivenhall End (Asset 420) and aligning the road between junctions 24 (Kelvedon North interchange) and 25 (Marks Tey interchange) in order to avoid the grade II listed Doggets Hammer Farm at Marks Tey (Asset 795). • Realigning the proposed bypass between junctions 22 (Colemans interchange) and 23 (Kelvedon South interchange) has reduced the impact on the setting of the Rivenhall Long Mortuary Enclosure Scheduled Monument (Asset 399). Measures to better reveal the significance of heritage assets will include: • interpretation of archaeological information through the reported fieldwork results.

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		• appropriate outreach and engagement opportunities for the proposed scheme would be identified throughout the construction and operational phases of the proposed scheme and including activities such as presentations, scientific outreach activities at local schools, volunteering programmes, media coverage, web-based initiatives, information and progress signage at appropriate locations • permanent heritage interpretation at relevant sites, such as the Kelvedon Warrior (Asset 657), Rivenhall Long Mortuary Enclosure Scheduled Monument (Asset 399) and Prested Hall (Asset 730) There are no World Heritage Sites affected by the proposed scheme.
5.9.16	A documentary record of our past is not as valuable as retaining the heritage asset, and therefore the ability to record evidence of the asset should not be a factor in deciding whether such loss should be permitted, and whether or not consent should be given.	No direct impacts have been predicted for the eight scheduled monuments identified in the archaeological remains baseline.
5.9.17	Where the loss of the whole or part of a heritage asset's significance is justified, the Secretary of State will require the applicant to record and advance understanding of the significance of the heritage asset before it is lost (wholly or in part). The extent of the requirement should be proportionate to the asset's importance and significance and the impact. The	Significant effects on designated cultural heritage assets, during the operation and construction phases, have been identified and, where practicable, have been mitigated, as discussed in Chapter 7: Cultural heritage, of the ES [APP-074]. After the introduction of appropriate mitigation to reduce the impact of the significant effects on cultural

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	applicant should be required to publish this evidence and to deposit copies of the reports with the relevant Historic Environmental Record. They should also be required to deposit the archive generated in a local museum or other public repository willing to receive it.	heritage assets, it is assessed that across archaeology, built heritage and historic landscapes there would largely be a combination of slight to moderate adverse significant effects for construction and operation. NPPF Planning Practice Guidance (Online - 2021), Historic Environment, paragraph 18defines 'substantial harm' as effects of very large and large adverse significance. The proposed scheme would not result in any effects of very large or large significance, and after mitigation would therefore not result in 'substantial harm' to cultural heritage assets. Section 7.11 of Chapter 7: Cultural Heritage of the ES [APP-074] details the assessment of likely significant effects and also provides mitigation to ensure these affects would not result in substantial harm as defined by the NPPF A summary of all effects on cultural heritage, including those assessed not to be significant, is presented in Appendix 7.9: Cultural Heritage Impact Assessment Summary Tables, of the ES [APP-117]. A summary of the impact on cultural heritage is presented in the CftS [APP-249].
5.10 Landscape and Visual		
5.10.15	The applicant should carry out a landscape and visual impact assessment and report it in the ES, including cumulative effects (see Section 4.2). Several guides have been produced to assist in addressing landscape issues.	Section 8.11 of Chapter 8: Landscape and visual, of the ES [APP-075] considers likely significant landscape effects during both construction and operation. In line with DMRB LA107, the effect on the constituent landscape features and elements/components of the LCAs have been considered in

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		combination as part of the effects on landscape character and not as individual receptors. Section 8.11 within Chapter 8: Landscape and visual, of ES [APP-075] considers likely significant visual effects during both construction and operation. In accordance with DMRB LA107, aesthetic and perceptual qualities, including effects on dark skies and tranquillity, are included within the assessment of landscape effects. Both day and night-time changes for landscape and visual receptors are considered. Effects relating to noise are included within Chapter 12: Noise and vibration, of the ES [APP-079]. Effects relating to nature conservation are included within Chapter 9: Biodiversity, of the ES [APP-076]. The qualitative assessment in Appendix 5.2: Gas main diversion screening assessment [APP-097 shows that one aspect is likely to give rise to likely significant effects as a result of the gas main diversion; landscape and visual. This is due to the loss of trees and woodland, which would impact the landscape character of the River Blackwater valley, open up views across the Blackwater River Valley towards the A12, and result in loss of lowland mixed deciduous woodland habitat. There would be permanent loss of willow plantation west of the River Blackwater, which is a distinctive characteristic feature of this landscape. It would not be appropriate to plant vegetation other than that permitted within Cadent's standards and specifications: large trees are generally excluded from planting within the pipeline easement.

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5.10.16	The landscape and visual assessment should include reference to any landscape character assessment and associated studies as a means of assessing landscape impacts relevant to the proposed project. The applicant's assessment should also take account of any relevant policies based on these assessments in local development documents in England and local development plans in Wales.	The landscape and visual impact assessment, in Chapter 8: Landscape and visual, of the ES [APP-075] considers likely significant landscape and visual effects within Section 8.11. The assessment of landscape effects has been made on the local landscape character areas defined within published assessments. The landscape and visual impact assessment takes account of local planning policies presented within Table 8.4 of Chapter 8 of the ES
5.10.18	The applicant should consider landscape and visual matters in the early stages of siting and design, where site choices and design principles are being established. This will allow the applicant to demonstrate in the ES how both negative effects have been minimised and opportunities for creating positive benefits or enhancement have been recognised.	Design principles which consider green infrastructure objectives to reduce significant effects on green infrastructure assets are presented in the Design Principles document [APP-280] and cover multiple aspects relevant to green infrastructure, including biodiversity. The Environmental Masterplan [APP-086 - APP-088] visually presents the proposed schemes approach to creating positive benefits to landscape.
5.10.19	The assessment should include the effects on landscape components and character during construction and operation. For projects which may affect a National Park, The Broads or an Areas of Outstanding Natural Beauty the assessment should include effects on the natural beauty and special qualities of these areas'.	National Parks, the Broads and AONBs are not found in the study area.
5.10.20	The assessment should include the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity. This should include light pollution effects, including on local amenity, and nature conservation.	Section 8.11 of Chapter 8: Landscape and visual, of the ES [APP-075] considers likely significant landscape effects during both construction and operation. In line with DMRB LA 107, the effect on the constituent landscape features and elements/components of the landscape character

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		areas have been considered in combination as part of the effects on landscape character and not as individual receptors.
5.10.21	The assessment should also demonstrate how noise and light pollution, and other emissions (see Section 5.2 and Section 5.7), from construction and operational activities on residential amenity and on sensitive locations, receptors and views, will be minimised.	Section 8.11 of Chapter 8: Landscape and visual, of the ES [APP-075] considers likely significant landscape effects during both construction and operation. In line with DMRB LA 107, the effect on the constituent landscape features and elements/components of the landscape character areas have been considered in combination as part of the effects on landscape character and not as individual receptors.
5.10.23	Applicants should consider how landscapes can be enhanced using landscape management plans, as this will help to enhance environmental assets where they contribute to landscape and townscape quality	The Landscape and Ecology Management Plan (LEMP) [APP-193] seeks to ensure the protection and management of landscape and ecological features such as vegetation and habitats, during construction of the proposed scheme, and the successful establishment of landscape and ecological mitigation including planting and seeding associated with the proposed scheme. The LEMP has been developed to ensure that the proposed scheme reflects the existing landscape character and context of the A12 between Chelmsford and Colchester. The design principles presented within the Design Principles document [REP2-006] have been used to inform development of the proposed scheme design, including the Environmental Masterplan [APP-086, APP-087 and APP-088]. The design principles relating to landscape focus on replacement of vegetation lost during construction, integration of the proposed scheme into the landscape, provision of

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		screening vegetation, reinforcement of the landscape pattern and character, improvement or reinstatement of natural habitats and creation of new habitats.
5.10.24	In considering visual effects it may be helpful for applicants to draw attention, in the supporting evidence to their applications, to any examples of existing permitted infrastructure they are aware of with a similar magnitude of impact on sensitive receptors. This may assist the Secretary of State in judging the weight they should give to the assessed visual impacts of the proposed development.	Chapter 8: Landscape and visual, of the ES [APP-075] assesses visual impact from representative viewpoints and Appendix 8.3 Visual effects schedule [APP-121] presents the assessment of visual effects. The number and location of viewpoints have been agreed through consultation with local planning authorities and Historic England. In accordance with the Design Manual for Roads and Bridges LA 107 Landscape and Visual Effects, Revision 2 (Highways England, 2020) and the Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013), the assessment of visual effects presented within Appendix 8.3 Visual effects schedule [APP-121] considers the existing view from each representative viewpoint assessed, the magnitude and significance of effect on that particular view. It has not been possible to draw parallels with examples of existing permitted infrastructure with a similar magnitude of impact on sensitive receptors, because the assessment of visual effects is specific to each representative viewpoint, the existing view and effects on each view in relation to the proposed scheme.

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5.11 Land Use, Including Open Space, Green Infrastructure, and Green Belt		
5.11.8	The ES (see Section 4.2) should identify existing and proposed250 land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan. The assessment should be proportionate to the scale of the preferred scheme and its likely impacts on such receptors. For developments on previously developed land, the applicant should ensure that they have considered the risk posed by land contamination and how it is proposed to address this.	The gas main diversion, including potential impacts of construction, have been subject to public consultation. See the Consultation report [APP-045] for further detail. Existing and proposed land uses and detail of relevant planning history relating to developments within and adjacent to the Order Limits are within the CftS [APP-249]. The existing conditions within the Scheme Order Limits and surrounding area are also reported in Chapters 6-15, of the ES [APP-073-082]. There are no areas of greenbelt in or around the Order Limits, and no sports and recreation buildings included within the Order Limits. Loss of open space has been assessed and is discussed in Chapter 13: Population and human health of the ES [APP-080] with further detail provided in Appendix 13.3: Detailed land use and accessibility assessment tables [APP-155]. Any loss of such community assets would be replaced by equivalent or improved provision. The Statement of Reasons [APP-042] also provides detail of land that is proposed to be acquired and brings reference in Section 7.2 to special category land forming part of open space that would be acquired for the delivery of the proposed scheme.
5.11.9	Applicants will need to consult the local community on their proposals to build on existing open space, sports or recreational buildings and land. Taking account of the consultations, applicants should consider providing new or	There are no areas of sports and recreation buildings included within the Order Limits. Loss of open space has been assessed and is discussed in Chapter 13: Population and human health, of the ES [APP-080], with further detail

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	additional open space including green and blue infrastructure, sport or recreation facilities, to substitute for any losses as a result of their proposal.	provided in Appendix 13.3: Detailed Land Use and Accessibility Assessment Tables, of the ES [APP-155]. Any loss of such community assets would be replaced by equivalent or improved provision. The land identified as open space and its replacement land are explained and identified in the Replacement Land Statement [APP-279].
5.11.10	Applicants should use any up-to-date local authority assessment or, if there is none, provide an independent assessment to show whether the existing open space, sports and recreational buildings and land is surplus to requirements.	There are no areas of greenbelt in or around the Order Limits, and no sports and recreation buildings included within the Order Limits. Loss of open space has been assessed and is discussed in Chapter 13: Population and human health, of the ES [APP-080], with further detail provided in Appendix 13.3: Detailed Land Use and Accessibility Assessment Tables, of the ES [APP-155]. Any loss of such community assets would be replaced by equivalent or improved provision. The land identified as open space and its replacement land are explained and identified in the Replacement Land Statement [APP-279]. The Statement of Reasons [APP-042] also provides detail of land that is proposed to be acquired, Section 7.2 of which refers to special category land forming part of open space that would be acquired for the delivery of the proposed scheme.
5.11.12	Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5).	Chapter 10: Geology and soils, of the ES [APP-077] details the site-specific ALC survey undertaken for the proposed scheme to clearly identify areas of best and most versatile (BMV) land. The full report is presented in Appendix 10.2: Agricultural Land Classification Survey Report, of the ES

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		[APP-143]. The first iteration of the EMP [APP-184] includes a Soil Handling Management Plan, which details how the proposed scheme will seek to minimise the impact on soil quality, and a Contaminated Land Management Plan, which demonstrates how contaminated land will be remediated if discovered during construction. The design for all elements of the proposed scheme has sought to limit land-take as far as practicable. Permanent sealing or wastage of topsoil will be avoided via stripping and reuse elsewhere, and best practice soil management measures will be followed to limit degradation during its handling. The proposed soil management measures to be adopted during construction are detailed in Chapter 10: Geology and soils, of the ES [APP-077].
5.11.13 – 5.11.14	Applicants should also identify any effects and seek to minimise impacts on soil health and protect and improve soil quality taking into account any mitigation measures proposed. Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination. The sustainable reuse of soils needs to be carefully considered in line with good practice guidance where large quantities of soils are surplus to requirements or are affected by contamination.	Chapter 10: Geology and soils, of the ES [APP-077] details the site-specific ALC survey undertaken for the proposed scheme to clearly identify areas of best and most versatile (BMV) land. The full report is presented in Appendix 10.2: Agricultural Land Classification Survey Report, of the ES [APP-143]. The first iteration of the EMP [APP-184] includes a Soil Handling Management Plan, which details how the proposed scheme will seek to minimise the impact on soil quality, and a Contaminated Land Management Plan, which demonstrates how contaminated land will be remediated if discovered during construction. The design for all elements of the proposed scheme has sought to limit land-take as far as practicable. Permanent sealing or wastage of topsoil will be avoided via stripping

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		and reuse elsewhere, and best practice soil management measures will be followed to limit degradation during its handling. The proposed soil management measures to be adopted during construction are detailed in Chapter 10: Geology and soils, of the ES [APP-077]. Appendix 10.1: Land Quality Risk Assessment, of the ES [APP-142] includes the land quality risk assessment which has been completed in line with the Land Contamination Risk Management (Environment Agency, 2021). A summary of the assessment is included in Chapter 10: Geology and soils, of the ES.
5.11.15	Developments should contribute to and enhance the natural and local environment by preventing new and existing developments from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.	TEXT TO BE ADDED Any construction-related risks and impacts will be managed through the Environmental Management Plan, which incorporates 13 appendices that deal with specific risks, including Appendix A Register of Environmental Actions and Commitments, Appendix E Dust Management Plan, Appendix M Soil Handling Management Plan and Appendix N Water Management Plan. The First Iteration of the Environmental Management Plan is presented in the Examination Library APP-184 to APP-198 as updated by REP4-022 to REP4-030. The gas pipeline diversion is being designed and will be operated in compliance with the regulations, industry good practice and the specific requirements of the company. This would minimise the risk of incidents leading to soil, air,

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		water or noise pollution or land instability during the operational life of the pipeline.
5.11.16	Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.	The construction of the gas main diversion has the potential to give rise to construction dust and affect the water environment. These risks would be managed through the implementation of the Construction Environmental Management Plan (CEMP). The Register of Environmental Actions and Commitments in Annex A of the First Iteration Environmental Management Plan, includes commitments for construction dust management (Commitment GN1 and AQ1) and a commitment for trenchless techniques to cross main rivers (LV15). With these commitments in place, no significant construction effects are predicted. In the longer term, the operation of the gas main diversion would result in no change to environmental conditions such as air and water quality.
5.11.17	Applicants should ensure that a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination, and where contamination is present, applicants should consider opportunities for remediation where possible. It is important to do this as early as possible as part of engagement with the relevant bodies before the official pre-application stage	The preferred route of the gas main diversion has been developed whilst considering the functionality, infrastructure and environmental constraints. Effects below the surface are assessed within Chapter 10: Geology and soils, of the ES [APP-077] which considers land contamination (effects on human health, surface water and groundwater). Mineral resources are covered in Chapter 11: Material assets and waste, of the ES [APP-078]. A complete list of mitigation measures is presented in the REAC within the first iteration of the (EMP) [APP-184]. Some of the potential gas main diversion routes (1, 2 and 3) were discounted as they would have crossed an existing

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		historic landfill (where Whetmead Local Nature Reserve is located). When measured against industry standards, these routes were found to pose unacceptable levels of risk in terms of contamination, corrosion, explosion and subsidence.
5.11.19	Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place.	Mineral resources are assessed in Chapter 11: Material assets and waste, of the ES [APP-078]. The alignment of the mainline around junction 22 (Colemans interchange) has been revised to reduce the impact on Colemans Farm Quarry, limiting impacts to the quarry's extraction programme. Appendix 11.1: Mineral Resource Assessment, of the ES [APP-144] has been prepared to establish the existence, or otherwise, of a mineral resource capable of having economic importance within the Order Limits. A Mineral Resource Assessment (Appendix 11.1 of the Environmental Statement [APP-144]) has been prepared to establish the existence, or otherwise, of a mineral resource capable of having economic importance within the Order Limits. Where the proposed scheme could result in the sterilisation of mineral resources, the environmental, social and economic viability of prior extraction has been considered. The viability assessment as part of the MRA concludes that it would not be viable to prior extract and backfill the minerals that would be sterilised by the proposed scheme.
5.12 Noise and Vibration		

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5.12.6	Where noise impacts are likely to arise from the proposed development, the applicant should include the following in the noise assessment:
	• a description of the noise generating aspects of the development proposal leading to noise impacts, including the identification of any distinctive tonal, impulsive, low frequency or temporal characteristics of the noise
	• identification of noise sensitive receptors and noise sensitive areas that may be affected
	• the characteristics of the existing noise environment
	• a prediction of how the noise environment will change with the proposed development
	  ○ in the shorter term, such as during the construction period
	  ○ in the longer term, during the operating life of the infrastructure
	  ○ at particular times of the day, evening and night (and weekends) as appropriate, and at different times of year
	• an assessment of the effect of predicted changes in the noise environment on any noise-sensitive receptors, including an assessment of any likely impact on health and well-being where appropriate, and noise-sensitive areas
		A description of the existing situation is contained within Section 12.8 of Chapter 12: Noise and Vibration, of the ES [APP-079]. The noise sources from the proposed scheme are described within section 12.9.
		The noise sensitive premises are identified within Section 12.8 of Chapter 12 and are shown on Figure 12.2: Noise Sensitive Receptors [APP-229]
		The characteristics of the existing noise environment are described within Section 12.8 of Chapter 12 and within Appendix 12.3: Noise baseline survey results [APP-149].
		The prediction of how the noise environment would change and the assessment of effects from this change is provided within Sections 12.9 and 12.11 of Chapter 12. This includes during the construction and operation phase.
		Mitigation measures are described in Section 12.10 of Chapter 12.

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	• if likely to cause disturbance, an assessment of the effect of underwater or subterranean noise • measures to be employed in mitigating the effects of noise using best available techniques to reduce noise impacts	
5.12.8	Applicants should consider the noise impact of ancillary activities associated with the development, such as increased road and rail traffic movements, or other forms of transportation	The assessment of road traffic noise is presented in Chapter 12: Noise and vibration, of the ES [APP-079]. It includes consideration of changes in road traffic noise for all road links where a significant change in noise is predicted, regardless of whether they are close to the proposed scheme or at a greater distance.
5.12.9	Operational noise, with respect to human receptors, should be assessed using the principles of the relevant British Standards and other guidance. Further information on assessment of particular noise sources may be contained in the technology specific NPSs. In particular, for renewables (EN-3) and electricity networks (EN-5) there is assessment guidance for specific features of those technologies. For the prediction, assessment and management of construction noise, reference should be made to any relevant British Standards and other guidance which also give examples of mitigation strategies	The predictions of road traffic noise are presented in Chapter 12: Noise and vibration, of the ES [APP-079]. They have been undertaken following the calculation methodology provided in Calculation of Road Traffic Noise (Department of Transport and Welsh Office, 1988). The assessments of construction noise and vibration have been undertaken with reference to BS 5228 Part 1 (British Standards Institution, 2014a) and Part 2 (British Standards Institution, 2014b).
5.12.10	Some noise impacts will be controlled through environmental permits and parallel tracking is encouraged where noise impacts determined by an environmental permit interface with planning issues (i.e. physical design and location of development). The applicant should consult EA and/or the SNCB, as necessary, and in particular regarding assessment	The requirement for environmental permits in the form of Section 61 consents will be discussed with the relevant local authorities. The local authorities are the relevant consultee in this situation, not the EA and/or SNCB.

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	of noise on protected species or other wildlife. The results of any noise surveys and predictions may inform the ecological assessment. The seasonality of potentially affected species in nearby sites may also need to be considered.	A series of noise surveys were undertaken in May 2021 and are reported in Appendix 12.3: Baseline noise surveys, of the ES [APP-149]. The results from these surveys, and the predicted noise levels from both construction and operation, have been used within the ecological assessment where necessary.
5.12.12	Applicants should submit a detailed impact assessment and mitigation plan as part of any development plan, including the use of noise mitigation and noise abatement technologies during construction and operation.	A detailed assessment of impacts from noise and vibration from the Proposed Scheme is contained within Chapter 12: Noise and vibration, of the ES [APP-079]. Proposed mitigation measures are described within Section 12.10 of Chapter 12, with the mitigation measures secured within the First Iteration Environmental Management Plan - Appendix A: Register of Environmental Actions and Commitments (REAC) [REP4-022]. This contains mitigation measures for construction and operation.
5.13 Socio-Economic Impacts		
5.13.2	Where the project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of these impacts as part of the ES (see Section 4.2).	A business case has been prepared for the proposed scheme in line with the Treasury Green Book Principles and Department for Transport TAG guidance. The results gathered for the Economics Case are presented in The Economic Appraisal Package Report, submitted as Appendix D to the Combined Modelling and Appraisal Report (ComMA) [APP-265], which demonstrates that economic appraisal of the proposed scheme has been prepared in accordance with the 'Green Book' - Appraisal and Evaluation in Central Government and explains that the

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		appraisal covers the economic, environmental and social impacts of the proposed scheme. It concludes that, taking account of the wider impacts of the proposed scheme and journey time reliability benefits, the proposed scheme will deliver an adjusted benefit cost ratio (BCR) of 1.7. This means that for every £1 spent on the proposed scheme there will be around £1.70 returned to society in benefits. In addition, an assessment has been made of potential cumulative impacts from the proposed scheme on the socio-economic aspects of housing and access to services, facilities, employment, education, and skills. This assessment has been made in recognition that there are several nationally significant infrastructure projects in the region beyond the population and human health study area, which may contribute to potentially significant cumulative impacts for the proposed scheme. Chapter 16: Cumulative effects, of the Environmental Statement (ES) [APP-083] assesses the significance of cumulative effects for both the construction and operation phases of the scheme.
5.13.3	The applicant is strongly encouraged to engage with relevant local authorities during early stages of project development so that the applicant can gain a better understanding of local or regional issues and opportunities.	Tables 1.11 and 2.9 of the Consultation Report Annex N, detail the local planning authorities involuted in the consultation [APP-062]. Table 2.1 Record of Engagement [APP-062] details the forms of correspondence and the date, with the key topics discussed and outcomes. Tables 1.11 Prescribed Consultees [APP-062] and Table 2.9 S42(a) Prescribed Consultees [APP-062] detail the local planning authorities involuted in the consultation and has a

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		record of engagement with each LPA with details on Statement of Common Ground. Extensive engagement has included letter, emails meetings, workshops. This has happened with: • Essex County Council - June 2016 until current [REP2-020. Table 2.1 Record of Engagement] • Chelmsford City Council - May 2016 until current [REP2-016. Table 2.1 Record of Engagement] • Colchester Borough Council - May 2016 until current [REP2-015. Table 2.1 Record of Engagement] • Braintree District Council - May 2016 until current [REP2-020. Table 2.1 Record of Engagement] • Maldon District Council - May 2016 until current [REP2-017. Table 2.1 Record of Engagement]
5.13.5 Socio-economic conditions	Applicants should describe the existing socio-economic conditions in the areas surrounding the proposed development and should also refer to how the development's socio-economic impacts correlate with local planning policies	Section 2.3 of the Case for the Scheme [APP-249] describes local and regional socio-economic conditions including population and employment growth. Section 8 of the Case for the Scheme sets out how the proposed scheme, notably paragraphs 8.2. 18 – 41 address how the strategic highway improvement correlates with local planning policy for socioeconomic growth. Tables 13.19 to 13.21 in Chapter 13, Population and Human Health [APP-080] provide data on socio-economic indicators to inform

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		the baseline health sensitivity of the population in the study area. Table 1.2 of Appendix 13.5 Legislative and Policy Framework, of the Environmental Statement [APP-157] refers to local planning policy relating to the role of transport infrastructure to support housing growth, community and leisure facilities, sustainable growth, economic development, social infrastructure and healthy lifestyles. The table sets out how the Population and Human Health impacts assessed in Chapter 13 of the Environmental Statement [APP-080] relate to these socio-economic policy considerations.
5.13.6	Socio-economic impacts may be linked to other impacts, for example visual impacts considered in Section 5.10 but may also have an impact on tourism and local businesses. Applicants are encouraged, where possible, to demonstrate that local suppliers have been considered in any supply chain	This paragraph is very similar to paragraph 5.13.5 was in the previous draft EN-1 (2021), which was reviewed in paragraphs 1.2.3 – 1.2.5 of Appendix 13.5 Legislative and Policy Framework, of the Environmental Statement [APP-157]. As noted in APP-157 the gas pipeline diversion itself as an element of the Proposed Scheme is not considered to be of a scale to have likely significant socio-economic impacts. Nevertheless, the opportunity to use local suppliers has been considered, as demonstrated in paragraph 13.17.21 of Chapter 13 of the Environmental Statement [APP-080]. This is captured as commitment PH12 in the Register of Environmental Actions and Commitments [REP4-023] which forms part of the First Iteration EMP [APP-184] and would be secured through Requirement 3 of the draft DCO [REP4-008].

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5.13.7	Applicants should consider developing accommodation strategies where appropriate, especially during construction and decommissioning phases, that would include the need to provide temporary accommodation for construction workers if required.	It was considered if temporary accommodation for the workforce was required, it is stated in section 2.6.66 of Chapter 2: The Proposed Scheme [APP-069] that onsite accommodation is not proposed. Paragraphs 16.7.53 – 16.7.58 of the Cumulative Effects chapter of the Environmental Statement [APP-083] provides an analysis of potential impacts of the construction workforce on tourist accommodation, local housing and rental market, which underpins the decision that onside accommodation is not proposed.
5.14 Traffic and Transport		
5.14.4	The applicant's assessment should consider all relevant socio-economic impacts, which may include: • the creation of jobs and training opportunities. Applicants may wish to provide information on the sustainability of the jobs created, including where they will help to develop the skills needed for the UK's transition to Net Zero • the contribution to the development of low-carbon industries at the local and regional level as well as nationally • the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities	At the time of scoping and preparation of the Environmental Statement the National Policy Statement for National Networks did not outline a requirement to address socio-economic impacts and therefore the scope of assessment focused on addressing the aspects of population and human health in accordance with DRMB LA 112. However, the requirements for addressing socio-economic impacts as set out in the Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) were considered in relation the proposed gas main diversion works. As stated in paragraph 1.2.4 of Appendix 13.5 Legislative and Policy Framework, of the Environmental Statement [APP-157], it was concluded that

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	• any indirect beneficial impacts for the region hosting the infrastructure, in particular in relation to use of local support services and supply chains • effects on tourism • the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development • cumulative effects - if development consent were to be granted to for a number of projects within a region and these were developed in a similar timeframe, there could be some short-term negative effects, for example a potential shortage of construction workers to meet the needs of other industries and major projects within the region	the gas main diversion of the nature included in the proposed scheme is not likely to have socio-economic impacts (positive or negative) at local or regional levels as it would not create many jobs or training opportunities, additional services, effects on tourism or a significant influx of workers. The Environmental Statement [APP-080] has reported relevant socio-economic impacts in relation to wider determinants of human health in the Population and Human Health Assessment (Chapter 13 of the Environmental Statement [APP-080]) and regional socio-economic impact in cumulation with other major development in the Cumulative Effects Assessment (Chapter 16 of the Environmental Statement [APP-083]). • Paragraphs 13.18.29 – 13.18.34 of the Population and Human Health assessment [APP-080] provide an assessment of the potential creation of jobs and training opportunities during the construction phase. As noted in that assessment there is an element of uncertainty in the overall numbers of new jobs considered likely as this is affected by a number of issues such as market conditions at the time of construction, the evolution of sustainable construction practices involving offsite, low carbon construction, and the skill capacity of the supply chain partners who would be employed on the project.

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		• The Case for the Scheme [APP-249] estimates that journey time savings would provide £235.5 million benefit to business users and providers (para 6.3.4) while paragraph 6.3.14 identifies that the value of productivity improvements to the economy would amount to £253.9 million and these productivity benefits relate in part to improvements in journey time. The Population and Human Health assessment [APP-080] provides an assessment of health impacts relating to the determinant 'access to services, employment, education facilities and skills' which covers issues such as access to local public and key services, connections to jobs, links between communities (see Table 13.13 of Chapter 13, [APP-080]). Paragraphs 13.15.35 – 13.15.40 provide the baseline, while paragraphs 13.18.24 – 34 and 13.18.82 – 88 provide the assessment in terms of value to human health. • As a highway scheme, the provision of additional local services, including the provision of educational and visitor facilities, are not directly relevant to the scope of the proposed scheme. However the proposed scheme does provide some improvements to local transport infrastructure as assessed in paragraphs 13.10.48 – 58 of the Population and Human Health assessment in Chapter 13 [APP-080]. The Applicant has committed in engaging with key stakeholders such as Essex County Council, schools, colleges, Local Enterprise Partnerships

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		Prince's Trust and community organisations in the pre-construction phase to support education (STEM) opportunities and construction employment opportunities (see paragraph 13.17.20 – 21). A Community Liaison Manager would be appointed in the pre-construction phase to engage with local communities throughout the construction phase (PH1 of the Register of Environmental Actions and Commitments (REAC) [APP-185]. • Indirect benefits on the region in relation to local construction skills and employment are outlined in paragraph 16.7.65 of Chapter 16, Cumulative Effects, of the Environmental Statement [APP-083]. The Case for the Scheme [APP-249] section on 'wider economic benefits' addresses the estimated monetary value of improved productivity in jobs, increasing labour supply and other increases in business output. • Tourism was not specifically included in the scope of assessment as it was not considered to be a key industry within the study area for the proposed scheme (Table 2.1 of Appendix 13.2 Stakeholder Engagement and Scoping for Human Health [APP-154]). However potential effects on access to local recreation destinations are addressed in the assessment on community land and assets in Chapter 13 Population and Human Health [APP-080] and the supporting Appendix 13.3 [APP-155].

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		• The cumulative impact of the proposed scheme in combination with other nationally significant infrastructure projects in the region has been addressed in Chapter 16, Cumulative Effects, of the Environmental Statement [APP-083]. The assessment is set out in paragraphs 16.7.50 – 65. It considers the potential cumulative impacts from construction workers on housing, health services, education services, employment and labour supply.
5.14.5	If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport appraisal. The DfT's Transport Analysis Guidance (TAG) and Welsh Governments WelTAG provides guidance on modelling and assessing the impacts of transport schemes	Transport impacts, including on local roads, have been assessed a in Sections 9.2 and 9.3 of the Transport Assessment [APP-253]. The contents of this report have been subject to discussion with local highway and planning authorities.
5.14.7 – 5.14.9	The applicant should prepare a travel plan including demand management and monitoring measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by active, public and shared transport to: • reduce the need for parking associated with the proposal; • contribute to decarbonisation of the transport network; • reduce the need to travel; and	The Design and Access Statement (DAS) [APP-268] provides an overview of the existing and proposed WCH network, and the mitigation put forward to ensure routes are preserved and enhanced. Further details for the WCH can be found on the Street, Rights of Way and Access Plan [AS-007-008]. The temporary diversions and closures and a travel plan for users and workers are shown on the Outline Construction Traffic Management Plan (OCTMP) [REP2-002-004] and these provide the mitigation measures as listed in the REAC, part of the first iteration of the EMP [APP-184] in order to ensure routes remain open or are diverted.

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	• secure behavioural change and modal shift through an offer of genuine modal choice and to mitigate transport impacts The assessment should also consider any possible disruption to services and infrastructure (such as road, rail and airports). If additional transport infrastructure is needed or proposed, it should always include good quality walking, wheeling and cycle routes, and associated facilities (changing/storage etc) needed to enhance active transport provision.	
5.4.11	Where mitigation is needed, possible demand management measures must be considered. This could include identifying opportunities to: • reduce the need to travel by consolidating trips, • locate development in areas already accessible by active travel and public transport, • provide opportunities for shared mobility • re-mode by shifting travel to a sustainable mode that is more beneficial to the network, • retime travel outside of the known peak times, • reroute to use parts of the network that are less busy	TEXT TO BE ADDED Section 2.6.67 – 2.6.69 of Chapter 2 The Proposed Scheme [APP-069] describes how the workforce would arrive onsite and travel form the main compounds to work fronts. Section 1.2.2 of the Outline Construction Traffic Management Plan [REP2-003] explains the proposed schemes traffic management strategies one being, Access routes to the proposed scheme directly to and from the SRN would be utilised as much as reasonably practicable. Where this is not feasible, measures have been identified to ensure the workforce, vehicles and equipment can gain safe access to required locations onsite, whilst minimising the impact on the LRN. Section 5.7.1 of the Outline Construction Traffic Management Plan [REP2-003] details the objective in the

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		siting of the construction compounds is to limit the use of the LRN by construction traffic as much as practical. To achieve this, the compounds/laydown areas would be accessed from as close to the A12 and SRN as practical, reducing traffic movements on the smaller capacity local routes.
5.14.13	Regard should always be given to the needs of freight at all stages in the construction and operation of the development including the need to provide appropriate facilities for HGV drivers as appropriate.	TEXT TO BE ADDED Section 3.1.2 of the Outline Construction Traffic Management Plan [REP2-003] explains that early engagement with freight companies and other stakeholders is already underway. Section 1.2.2 of the Outline Construction Traffic Management Plan [REP2-003] sets out the key considerations for traffic management planning within the proposed scheme. One of these being to maintain a minimum of two lanes of traffic in each direction throughout the length of the A12 affected by traffic management during weekday daytime. Section 5.19.6 of the Outline Construction Traffic Management Plan [REP2-003] explains how abnormal indivisible loads would travel through the proposed scheme.
5.15 Resource and Waste Management		

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
5.15.6 - 5.15.8	Applicants must demonstrate that development proposals are in line with Defra's policy position on the role of energy from waste in treating municipal waste. The proposed plant must not compete with greater waste prevention, re-use, or recycling, or result in over-capacity of EfW or similar processes for the treatment of waste at a national or local level. The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a report that sets out the sustainable management of waste and use of resources throughout any relevant demolition, excavation and construction activities.	Section 11.10 of Chapter 11: Material Assets and Waste, of the ES [APP-078] describes the arrangements for the sustainable management of waste and use of resources throughout the demolition, excavation and construction activities associated with delivering the proposed scheme. As reported in Section 11.10 of Chapter 11: Material Assets and Waste, of the ES [APP-078], a Sustainable Sourcing Plan (SPP) will be prepared for the proposed scheme that sets out a clear framework to increase the procurement and use of sustainably and responsibly sourced construction materials and products. A Site Waste Management Plan (SWMP), an outline of which is included in the First Iteration Environmental Management Plan - Appendix L [APP-196], has been prepared to plan, implement, monitor and review waste reduction and management throughout the design and construction of the proposed scheme. Specifically, the SWMP will be used by the Principal Contractor to quantify waste arisings and facilitate the identification and implementation of waste prevention at the detailed design stage, and the reuse, recycling and other recovery opportunities during the construction stage of the proposed scheme. The waste hierarchy will be followed as a priority order to achieve the best overall environmental outcome where practicable, and limit waste generation and disposal to landfill in line with the prevailing national policy targets. The

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
		SWMP will also document the proposed waste recovery / disposal system for all waste generated during construction. It should be noted that the SWMP, included in First Iteration Environmental Management Plan - Appendix L [APP-196], is a live document which will be updated as part of the second iteration of the EMP (produced for the construction phase) and the third iteration of the EMP (developed at the end of the construction phase).
5.15.9	The arrangements described and a report setting out the sustainable management of waste and use of resources should include information on how re-use and recycling will be maximised in addition to the proposed waste recovery and disposal system for all waste generated by the development. They should also include an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation.	Section 11.10 of Chapter 11: Material Assets and Waste, of the ES [APP-078] describes the arrangements for the sustainable management of waste and use of resources during the construction of the proposed scheme. This includes measures to maximise the reuse and recycling of waste where practicable. As reported in Section 11.10 of Chapter 11: Material Assets and Waste, of the ES [APP-078], a Sustainable Sourcing Plan (SPP) would be prepared for the proposed scheme that sets out a clear framework to increase the procurement and use of sustainably and responsibly sourced construction materials and products. A Site Waste Management Plan (SWMP), an outline of which is included in the First Iteration Environmental Management Plan - Appendix L [APP-196], has been prepared to plan, implement, monitor and review waste reduction and management throughout the design and construction of the proposed scheme.

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
		Specifically, the SWMP will be used by the Principal Contractor to quantify waste arisings and facilitate the identification and implementation of waste prevention at the detailed design stage, and the reuse, recycling and other recovery opportunities during the construction stage of the proposed scheme. The waste hierarchy will be followed as a priority order to achieve the best overall environmental outcome where practicable, and limit waste generation and disposal to landfill in line with the prevailing national policy targets. The SWMP will also document the proposed waste recovery / disposal system for all waste generated during construction. It should be noted that the SWMP, included in First Iteration Environmental Management Plan - Appendix L [APP-196], is a live document which will be updated as part of the second iteration of the EMP (produced for the construction phase) and the third iteration of the EMP (developed at the end of the construction phase). Whilst Section 11.11 of Chapter 11: Material Assets and Waste, of the ES [APP-078] provides an assessment of the impact of construction waste on the future forecast available landfill capacity within the study area, DMRB LA 110 precludes the need to assess the impact of construction waste arising on non-landfill facilities. Notwithstanding this, the impact of construction waste arising from the proposed scheme on regional and sub-regional waste management facilities has been addressed

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
		in the ancillary discussion provided in paragraphs 11.11.51 to 11.11.55 of Chapter 11: Material Assets and Waste, of the ES [APP-078]. This discussion was provided in response to Essex County Council's Scoping Opinion and statutory consultation feedback and does not form the central basis of the assessment of likely significant effects for this aspect, which has been undertaken in accordance with the DMRB LA 110 assessment standard. Operational impacts were scoped out of the assessment provided in Chapter 11: Material Assets and Waste, of the ES [APP-078] in accordance with the Scoping Opinion (Planning Inspectorate, 2021) and on the basis of the rationale provided in paragraphs 11.9.17 to 11.9.23 of this chapter which equally applies to the gas main diversion. An assessment of the impact of the waste arising from the proposed scheme on the capacity of waste management facilities to deal with other waste arising in the study area, for at least five years of operation, has not been undertaken as this is not required in relation to the proposed scheme.
5.15.10	The applicant is encouraged to refer to the 'Waste Prevention Programme for England' and 'Towards Zero Waste: Our Waste Strategy for Wales' and should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome	Table 11.5 of Chapter 11: Material Assets and Waste, of the ES [APP-078] makes reference to the Waste Prevention Programme for England: Towards a Resource Efficient Economy in the identified legislative and policy framework. Section 11.10 of Chapter 11: Material Assets and Waste, of the ES [APP-078] describes the measures to be taken to minimise the volume of waste produced and the volume of

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
		waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome. A Site Waste Management Plan (SWMP), an outline of which is included in the First Iteration Environmental Management Plan - Appendix L [APP-196], has been prepared to plan, implement, monitor and review waste reduction and management throughout the design and construction of the proposed scheme. Specifically, the SWMP will be used by the Principal Contractor to quantify waste arisings and facilitate the identification and implementation of waste prevention at the detailed design stage, and the reuse, recycling and other recovery opportunities during the construction stage of the proposed scheme. The waste hierarchy will be followed as a priority order to achieve the best overall environmental outcome, and limit waste generation and disposal to landfill in line with the prevailing national policy targets. The SWMP will also document the proposed waste recovery / disposal system for all waste generated by the proposed scheme. It should be noted that the SWMP, included in First Iteration Environmental Management Plan - Appendix L [APP-196], is a live document which will be updated as part of the second iteration of the EMP (produced for the construction phase) and the third iteration of the EMP (developed at the end of the construction phase).

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
5.15.12	The UK is committed to moving towards a more 'circular economy'. Where possible, applicants are encouraged to source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers. Construction best practices should be used to ensure that material is reused or recycled onsite where possible	As reported in Section 11.10 of Chapter 11: Material Assets and Waste [APP-078], a Sustainable Procurement Plan (SPP) would be prepared for the proposed scheme that sets out a clear framework to increase the procurement and use of sustainably and responsibly sourced construction materials and products. Table 2.11 in Chapter 2: The proposed scheme, of the Environmental Statement [APP-069] provides a summary of the types of construction materials and products to be consumed on the proposed scheme that are likely to hold certification to a recognised responsible sourcing standard. Additional mitigation regarding low carbon materials is provided in Chapter 15: Climate, of the Environmental Statement [APP-082]
5.15.13	Applicants are also encouraged to use construction best practices in relation to storing materials in an adequate and protected place on site to prevent waste, for example, from damage or vandalism. The use of Building Information Management tools (or similar) to record the materials used in construction can help to reduce waste in future decommissioning of facilities, by identifying materials that can be recycled or reused.	As reported in Section 11.10 of Chapter 11: Material Assets and Waste [APP-078],, waste 'duty of care' requirements would be complied with throughout the construction of the proposed scheme. The detailed design of the proposed scheme would consider how materials can be designed to be more easily adapted over an asset lifetime and how de-constructability and de-mountability of elements can be increased at end of first life.
5.16 Waste Quality and Resources		
5.16.3	Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment, and how this might change due to the	Water quality and impacts of the gas main diversion upon them are described within Chapter 14: Road drainage and the water environment, of the ES [APP-081] and Appendix 14.1: Water Quality Assessment [APP-158]. Issues relating to the Water Framework Directive are addressed within

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
	impact of climate change on rainfall patterns and consequently water availability across the water environment, as part of the ES or equivalent (see Section 4.2 and 4.9)	Appendix 14.2: Detailed Water Environment Regulations Compliance Assessment [APP-159]. Groundwater issues are further discussed within Appendix 14.4: Groundwater Assessment [APP-161].
5.16.4	The applicant should make early contact with the relevant regulators, including the local authority, the Environment Agency and Marine Management Organisation, where appropriate, for relevant licensing and environmental permitting requirements.	The Consents, Licences and Agreements Position Statement [REP3-007] sets out National Highways' intended strategy for obtaining the consents and associated agreements needed to implement the proposed scheme. It details the applications that will be made on behalf of the proposed scheme to the Environment Agency and Essex County Council as the Lead Local Flood Authority. Discussions have taken place during development of the ES regarding likely requirements for abstraction licensing with the Environment Agency and with Anglian Water as the water supplier and sewerage undertaker. A list of licences and permits required for the construction and operation of the proposed scheme, including those required by Anglian Water and the Environment Agency, is available in the Consents, Licences and Agreements Position Statement [REP3-007]. The impacts of the proposed scheme on water quality, water resources and physical characteristics are addressed within Chapter 14: Road drainage and water environment, of the ES [APP-081] and its associated appendices and the draft Statements of Common Ground between the parties, which will be submitted during the examination
5.16.5	Where possible, applicants are encouraged to manage surface water during construction by treating surface water runoff from	Measures to mitigate the potential water impacts during construction are set out in Appendix N of the EMP; the

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
	exposed topsoil prior to discharging and to limit the discharge of suspended solids e.g. from car parks or other areas of hard standing, during operation	water Management Plan [APP-198]. The purpose of this WMP is to detail the water management principles and procedures to: • Prevent the pollution of and contamination to groundwater and surface waters • Protect and preserve the hydromorphological and ecological elements of watercourses and water resources • Plan how water would drain from the site during construction • Identify measures to mitigate the risk of flooding as a result of the construction of the proposed scheme • Identify measures for the sustainable use of water
5.16.6	Applicants are encouraged to consider protective measures to control the risk of pollution to groundwater beyond those outlined in River Basin Management Plans and Groundwater Protection Zones - this could include, for example, the use of protective barriers.	The magnitude of impacts and significance of effects of discharges to groundwater along with mitigation measures is considered through the water quality assessment report [APP-158] and the groundwater assessment [APP-161]. With the implementation of mitigation measures no significant impacts from proposed scheme discharges have been identified.
5.16.7	The ES should in particular describe: • the existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges,	Water quality and impacts of the proposed scheme upon them are described within Chapter 14: Road drainage and the water environment, of the ES [APP-081] and Appendix 14.1: Water Quality Assessment Report, of the ES [APP-158]. Issues relating to the Water Framework Directive are

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
	proposed new discharges and proposed changes to discharges • existing water resources affected by the proposed project and the impacts of the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and reference to Abstraction Licensing Strategies) and also demonstrate how proposals minimise the use of water resources and water consumption in the first instance • existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics • any impacts of the proposed project on water bodies or protected areas (including shellfish protected areas) under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and source protection zones (SPZs) around potable groundwater abstractions • how climate change could impact any of the above in the future • any cumulative effects	addressed within Appendix 14.2: Detailed Water Environment Regulations Compliance Assessment, of the ES [APP-159]. Groundwater issues are further discussed within Appendix 14.4: Groundwater Assessment, of the ES [APP-161].
5.16.9	The risk of impacts on the water environment can be reduced through careful design to facilitate adherence to good pollution	The first iteration Environment Management Plan [APP-184] includes measures that will ensure good pollution

Draft EN-1 paragraph number	Requirement of the Draft EN-1	Compliance with the Draft EN-1
	control practice. For example, designated areas for storage and unloading, with appropriate drainage facilities, should be clearly marked.	control practice during construction of the proposed Scheme. This has been reviewed by stakeholders including the Environment Agency and will be developed further for the second iteration Environmental Management Plan.
5.16.10	The impact on local water resources can be minimised through planning and design for the efficient use of water, including water recycling. If a development needs new water infrastructure, significant supplies or impacts other water supplies, the applicant should consult with the local water company and the EA or NRW.	In the response to the Environment Agency's written representation at Deadline 2 submitted by the Applicant at Deadline 3 [REP3-009] connections to mains supply would be a temporary measure and discussions with the water company are ongoing.

Table 2. National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
2.3 Climate Change adaptation		
2.3.4	As climate change is likely to increase risks to some of this infrastructure, from flooding or rising sea levels for example, applicants should in particular set out how the proposal would be resilient to: • increased risk of flooding; • effects of rising sea levels and increased risk of storm surge; • higher temperatures; • increased risk of earth movement, coastal erosion, or subsidence from increased risk of flooding and drought; and • any other increased risks identified in the applicant's assessment	The design of the scheme as a whole and of the gas main diversion in particular have been developed taking into account the potential implications of climate change such as resilience to flooding and high temperatures. The EIA process has considered the effects of possible future changes in climate over a 60-year appraisal period and potential impacts of these climatic changes have been assessed in Chapter 15: Climate, of the Environmental (ES) Statement [APP-082]. The drainage design has been developed taking into account future potential increases in flooding, whilst the impacts have been considered in Appendix 14.5: Flood Risk Assessment (FRA) [APP-162]. The guidance on climate change allowances has been used (Environment Agency (2021) Flood risk assessments: climate change allowances). Mitigation measures with regards to climate change are secured in the Register of Environmental Actions and Commitments (REAC) within the first iteration of the Environmental Management Plan (EMP) [APP-184].
2.3.5	The resilience of the project to climate change should be assessed in the Environmental Statement (ES) accompanying an	The EIA process has considered the effects of possible future changes in climate over a 60-year appraisal period

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
	application. For example, future increased risk of flooding should be covered in the flood risk assessment.	and potential impacts of these climatic changes have been assessed in Chapter 15: Climate, of the ES [APP-082].
2.4.1 Consideration of "good design" for Energy Infrastructure		
2.4.1	The Planning Act 2008 requires the Secretary of State to have regard, in designating an NPS, to the desirability of good design.	The gas main diversion is part of a number of utilities being diverted by the respective statutory undertakers. These diversions are subject to feasibility studies and preliminary design carried out by the statutory undertakers (as defined in the New Road and Street Works Act 1991). The gas main diversion currently has a draft scheme and budget estimate, this has formed the basis of the information presented in this application. As part of the development of the proposed scheme the Applicant carried out a Gas Main Screening Report available at Appendix 5.2 of the ES [APP-097] where an initial desk assessment of the possible environmental effects is captured. The Case for the Scheme (CftS) [APP-249] includes a gas main diversion statement which explains the characteristics of the pipeline, the need for its diversion and work done to identify possible routes. This section also contains details of the diverted pipeline in accordance with regulation 6(4) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009. Chapter 5: Environmental assessment methodology of the ES [APP-072] sets out the assessment methodology and approach taken to prepare the EIA. Chapter 5 also includes details of how the proposed scheme has been assessed

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
		where information was not available to inform the assessment. In addition, each of the topic chapters of the ES gives a description of the assumptions made and the limitations of the assessment in relation to the proposed scheme as a whole and the gas main diversion.
2.4.2	Applicants should consider the criteria for good design set out in EN-1 Section 4.6 at an early stage when developing projects.	Design Principles [REP2-006] have been developed for the proposed scheme have been used to inform development of the proposed scheme design, including the Environmental Masterplan [APP-086 - APP-088]. The Materials & Landscaping Palette [REP2-033] sets out how the design principles will be translated into physical form, by providing visual indicative examples of materials and landscaping palettes. These design principles have taken national and local policy and guidance into consideration, including relevant local design codes. Section 1.3 of the Design Principles document [APP-280] refers to the relevant guidance. The design principles [REP2-006] and the proposed scheme as illustrated on the Environmental Masterplan [APP-086, - APP-088] respond to the objectives and principles set out in the National Design Guide and the National Model Design Code where relevant.
2.21 Natural Gas and Oil Pipelines: Applicant assessment		
2.21.1	When designing the route of new pipelines applicants should research relevant constraints including proximity of existing and planned residential properties, schools and hospitals, railway	The impact of the gas main diversion has been assessed and discussed in each of the topic Chapters 6 to 16 of the ES APP-073-083. This includes the existing baseline

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
	crossings, major road crossings, below surface usage and proximity to environmentally sensitive areas, main river and watercourse crossings.	environment as well as reporting the potential impacts in combination with planned development.
2.21.2 & 2.21.4	Applicants should undertake desktop studies in the first instance, followed up by consulting the appropriate authority, operator, or conservation body if necessary. Applicants should undertake desktop studies to identify historic or current mine workings, underground cavities serving industrial usage, the nature of any made ground, waste sites, unexploded ordnance, utility services and any other below surface usage when assessing routes for a pipeline.	The preferred route of the Cadent gas main diversion has been developed whilst considering the functionality, infrastructure, and environmental constraints. Effects below the surface are assessed within Chapter 10: Geology and soils, of the ES [APP-077] which considers land contamination (effects on human health, surface water and groundwater). Mineral resources are covered in Chapter 11: Material assets and waste, of the ES [APP-078]. A complete list of mitigation measures is presented in the (REAC) within the first iteration of the EMP [APP-184].
2.21.5	When choosing a pipeline route, applicants should seek to avoid or minimise adverse effects from usage below the surface. Additional study may also be required to support environmental assessments depending on evidence available and findings of desktop studies. Applicants may need to remove and dispose of contaminated material.	The preferred route of the Cadent gas main diversion has been developed whilst considering the functionality, infrastructure, and environmental constraints. Effects below the surface are assessed within Chapter 10: Geology and soils, of the ES [APP-077] which considers land contamination (effects on human health, surface water and groundwater). Mineral resources are covered in Chapter 11: Material assets and waste, of the ES [APP-078]. A complete list of mitigation measures is presented in the (REAC) within the first iteration of the EMP [APP-184].
2.21.8	When considering the route of the pipeline, further consideration to the potential maintenance of the pipeline should also be factored in and the impacts that maintenance or additional protection of the pipeline may have.	Depending on how far from the highway the pipeline is moved it provides an opportunity to provide better maintenance and to ensure minimal interaction that any future design changes may have on the highway. Possible

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
		route corridors have been considered in line with IGEM/TD/1. The following are some of the key considerations for this scheme: • Route corridors should, as far as possible, avoid close proximity when parallel to high density traffic routes, railways, overhead electricity transmission lines, major pipelines or other buried plant. • The length of the route should be kept to a reasonably practicable minimum. • Possible route corridors should be identified using the following criteria: • the pipeline start and finish points. • a safe route corridor that avoids populated areas where reasonably practicable and takes account of constructability. • Any intermediate fixed points. • Avoidance, as far as practicable, of any significant environmental, archaeological and future developments and of engineering constraints. • The shortest distance between the start and finish points, bearing in mind the above criteria and the implication for project costs. • The requirements in the design of pipelines, including minimum proximity distances between the pipeline and normally occupied dwellings.

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
2.21.10 - 2.21.14	The HSE enforces these Regulations, which place general duties on all pipeline operators and additional duties on the operators of major accident hazard pipelines. The additional duties require the pipeline operator to provide certain information to HSE at various stages in the lifecycle of a pipeline. In determining compliance, HSE expects pipeline operators to apply relevant good practice as a minimum. If a pipeline operator wishes to use other standards, recommendations, or guidance then this should be discussed with the HSE and may be acceptable to the HSE, provided that the pipeline operator can demonstrate that they achieve at least the equivalent levels of safety. A gap analysis should be undertaken to confirm this.	Detailed designs are to be carried out by Cadent Gas Limited, or their designers on their behalf, and will be in accordance with established industry standards and specifications, which will include relevant risk assessments, and be subject to appropriate approvals and appraisals. Wherever further engagement is required with HSE with regard gas pipeline design and/or operation this will be entered into by Cadent Gas Limited during the early stages of Detailed Design.
2.21.17	The applicant will need to identify all the noise and vibration sensitive receptors likely to be affected during these phases and consider any associated pipeline maintenance or protection that may be additionally required.	The prediction of how the noise environment would change and the assessment of effects from this change are provided within Sections 12.9 and 12.11 of Chapter 12 of the ES [APP-079]. This includes during the construction and operation phase.
2.21.18	During the pre-construction phase there could be vibration effects from seismic surveys. During construction, tasks may include site clearance, soil movement, ground excavation, tunnelling, trenching, pipe laying and welding, and ground reinstatement.	A description of the existing situation is contained within Section 12.8 of Chapter 12: Noise and vibration, of the ES [APP-079]. The noise sensitive premises are identified within section 12.8 of Chapter 12 and are shown on Figure 12.2: Noise sensitive receptors [APP-229.

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
		The characteristics of the existing noise environment are described within Section 12.8 of Chapter 12 and within Appendix 12.3: Noise baseline survey results [APP-149]. The prediction of how the noise environment would change and the assessment of effects from this change is provided within Sections 12.9 and 12.11 of Chapter 12. This includes during the construction and operation phase. Mitigation measures are described in Section 12.10 of Chapter 12 and summarised in the first iteration of the EMP [APP-184].
2.21.19	In addition, increased HGV traffic may be generated on local roads by the movement of materials. These types of noise and vibration impacts will need to be assessed	A description of the existing situation is contained within Section 12.8 of Chapter 12: Noise and vibration, of the ES [APP-079]. The noise sensitive premises are identified within section 12.8 of Chapter 12 and are shown on Figure 12.2: Noise sensitive receptors [APP-229]. The characteristics of the existing noise environment are described within Section 12.8 of Chapter 12 and within Appendix 12.3: Noise baseline survey results [APP-149]. The prediction of how the noise environment would change and the assessment of effects from this change is provided within Sections 12.9 and 12.11 of Chapter 12. This includes during the construction and operation phase.

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
		Mitigation measures are described in Section 12.10 of Chapter 12 and summarised in the first iteration of the EMP APP-184].
2.21.30	The ES must include an assessment of the biodiversity and landscape and visual effects of the proposed route and of the main alternative routes considered (see Section 5.10 of EN-1).	The qualitative assessment in Appendix 5.2: Gas main diversion screening assessment [APP-097] shows that one aspect is likely to give rise to likely significant effects as a result of the gas main diversion; landscape and visual. This is due to the loss of trees and woodland, which would impact the landscape character of the River Blackwater valley, open up views across the Blackwater River Valley towards the A12, and result in loss of lowland mixed deciduous woodland habitat. There would be permanent loss of willow plantation west of the River Blackwater, which is a distinctive characteristic feature of this landscape. It would not be appropriate to plant vegetation other than that permitted within Cadent's standards and specifications: trees are generally excluded from planting within the pipeline easement.
2.21.31	The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work.	The qualitative assessment in Appendix 5.2: Gas main diversion screening assessment [APP-097] shows that one aspect is likely to give rise to likely significant effects as a result of the gas main diversion; landscape and visual. This is due to the loss of trees and woodland, which would impact the landscape character of the River Blackwater valley, open up views across the Blackwater River Valley towards the A12, and result in loss of lowland mixed deciduous woodland habitat. There would be permanent loss of willow plantation west of the River Blackwater, which

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
		is a distinctive characteristic feature of this landscape. It would not be appropriate to plant vegetation other than that permitted within Cadent's standards and specifications: trees are generally excluded from planting within the pipeline easement.
2.21.32	Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape.	The qualitative assessment in Appendix 5.2: Gas main diversion screening assessment [APP-097] shows that one aspect is likely to give rise to likely significant effects as a result of the gas main diversion; landscape and visual. This is due to the loss of trees and woodland, which would impact the landscape character of the River Blackwater valley, open up views across the Blackwater River Valley towards the A12, and result in loss of lowland mixed deciduous woodland habitat. There would be permanent loss of willow plantation west of the River Blackwater, which is a distinctive characteristic feature of this landscape. It would not be appropriate to plant vegetation other than that permitted within Cadent's standards and specifications: trees are generally excluded from planting within the pipeline easement.
2.21.40	Where the project is likely to have effects on water resources or water quality, for example impacts on groundwater recharge or on existing surface water or groundwater abstraction points, or on associated ecological receptors, the applicant should provide an assessment of the impacts in line with Section 5.16 of EN-1 as part of the ES.	Water quality and impacts of the gas main diversion upon them are described within Chapter 14: Road drainage and the water environment, of the ES [APP-081] and Appendix 14.1: Water Quality Assessment APP-158]. Issues relating to the Water Framework Directive are addressed within Appendix 14.2: Detailed Water Environment Regulations Compliance Assessment [APP-159]. Groundwater issues

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
		are further discussed within Appendix 14.4: Groundwater Assessment [APP-161]. Appendix 5.2: Gas main diversion screening assessment [APP-097] reported that no significant effects on water quality and resources would occur from the proposed gas main diversion.
2.21.41	Where the project is likely to give rise to effects on water quality, for example through siltation or spillages, discharges from maintenance activities or the discharge of disposals such as wastewater or solvents, the applicant should provide an assessment of the impacts.	Water quality and impacts of the gas main diversion upon them are described within Chapter 14: Road drainage and the water environment, of the ES [APP-081] and Appendix 14.1: Water Quality Assessment [APP-158]. Issues relating to the Water Framework Directive are addressed within Appendix 14.2: Detailed Water Environment Regulations Compliance Assessment [APP-159]. Groundwater issues are further discussed within Appendix 14.4: Groundwater Assessment [APP-161]. Appendix 5.2: Gas main diversion screening assessment [APP-097] reported that no significant effects on water quality and resources would occur from the proposed gas main diversion.
2.21.44	Applicants must assess the stability of the ground conditions associated with the pipeline route and incorporate the findings of that assessment in the ES (see Section 4.2 of EN-1) as appropriate.	An assessment of geology and soils is reported in Chapter 10: Geology and soils, of the ES [APP-077]. This chapter discusses the ground conditions of land within the order limits, including the gas main diversion. Appendix 5.2: Gas main diversion screening assessment [APP-097] reported that no significant effects on geology and soils would occur from the proposed gas main diversion.

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
2.21.45	Desktop studies, which include known geology and previous borehole data, can form the basis of the applicant's assessment.	An assessment of geology and soils is reported in Chapter 10: Geology and soils, of the ES [APP-077]. This chapter discusses the ground conditions of land within the order limits, including the gas main diversion. Appendix 5.2: Gas main diversion screening assessment [APP-097] reported that no significant effects on geology and soils would occur from the proposed gas main diversion.
2.21.46	The applicant may find it necessary to sink new boreholes along the preferred route to better understand the ground conditions present.	An assessment of geology and soils is reported in Chapter 10: Geology and soils, of the ES [APP-077]. This chapter discusses the ground conditions of land within the order limits, including the gas main diversion. Appendix 5.2: Gas main diversion screening assessment [APP-097 reported that no significant effects on geology and soils would occur from the proposed gas main diversion.
2.21.47	The assessment should cover the options considered for installing the pipeline and weigh up the impacts of the means of installation.	An assessment of geology and soils is reported in Chapter 10: Geology and soils, of the ES [T APP-077]. This chapter discusses the ground conditions of land within the order limit. An assessment of geology and soils is reported in Chapter 10: Geology and soils, of the ES [APP-077]. This chapter discusses the ground conditions of land within the order limits, including the gas main diversion. Appendix 5.2: Gas main diversion screening assessment [APP-097] reported that no significant effects on geology and soils would occur from the proposed gas main diversion.

Draft EN-4 paragraph number	Requirement of the Draft EN-4	Compliance with the Draft EN-4
		Appendix 5.2: Gas main diversion screening assessment [APP-097 reported that no significant effects on geology and soils would occur from the proposed gas main diversion.
2.21.48	Where the applicant proposes to use horizontal directional drilling (HDD) as the means of installing a pipeline under a National or International Site16 and mitigating the impacts, the assessment should cover whether the geological conditions are suitable for HDD.	An assessment of geology and soils is reported in Chapter 10: Geology and soils, of the ES [APP-077]. This chapter discusses the ground conditions of land within the order limits, including the gas main diversion. Appendix 5.2: Gas main diversion screening assessment [APP-097] reported that no significant effects on geology and soils would occur from the proposed gas main diversion.