Bexhill to Hastings Link Road

Addendum to the Environmental Statement

Volume 1

East Sussex County Council
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Bexhill to Hastings Link Road

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Issue and Revision Record

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1 Introduction

1.1 Context

1.1.1 This addendum to the Environmental Statement (ES) has been prepared for the proposed Bexhill to Hastings Link Road (BHLR) Scheme, promoted by East Sussex County Council (ESCC). The Addendum to the ES is prepared in compliance with Regulation 19 of *The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999.*

1.1.2 The ES reports the findings of the Environmental Impact Assessment (EIA) for the Scheme and forms part of a detailed planning application for the Scheme prepared by ESCC Transport and Environment Department.

1.1.3 The purpose of the Addendum to the ES is to address the requirements for missing or additional environmental information required by the Planning Authority as being essential to the determination of the Planning Application for the Scheme.

1.1.4 The Addendum to the ES must be read in conjunction with the ES.

1.1.5 The following documents have already been submitted to the Development, Minerals and Waste Group of ESCC in their capacity as the Determining Authority for the Scheme under Regulation 3 of the Town and Country Planning General Regulations 1992:

- Environmental Statement;
- Non – technical summary (NTS);
- Traffic and Transport Report;
- Regeneration Statement;
- Design and Access Statement;
- Project-level Sustainability Appraisal;
- Waster Management Strategy;
- Scheme Design Drawings and associated supporting information; and,
- The Planning Statement.

1.1.6 In addition, the following documents are to be submitted to the Determining Authority for the Scheme:

The Addendum to the Environmental Statement;

The Addendum Design and Access Statement;

The Flood Risk Assessment;

The Regeneration Statement Addendum; and,

The Travel and Transport Addendum.

1.2 Scheme

1.2.1 The justification of the Scheme is principally driven by the existing socio-economic, transportation and environmental problems in the area. It has been recognised for many years that serious improvements in public transport and road links are vital to the regeneration of Bexhill and Hastings. Plans for a new Bexhill to Hastings Scheme were drawn up in 2003, with the aim of improving access to and within Hastings and Bexhill and to open up the north Bexhill and Hastings area for development, boosting the local economy and promoting regeneration.

1.2.2 The preferred route option for the Scheme would be 5.6 km long from its junction with the A259 in Bexhill to its junction with the B2092 Queensway in Hastings. The first 1.4 km of the road (the Bexhill connection) would be located along the bed of an abandoned railway line to pass through the built up area of Bexhill, constructed to a standard single two lane carriageway standard. The remainder of the road would be constructed to a wide two lane single carriageway standard.

1.2.3 The Scheme requires some property take at the western tie-in to the A259 in Bexhill, and the majority of this land and property has been acquired. Signalised junctions, including bus priority, would connect the western end of the Scheme with the A259 Belle Hill and A269 London Road in Bexhill, and the eastern end with the B2092 Queensway in Hastings.

1.2.4 The BHLR is seen as part of a “green” access corridor between Bexhill and Hastings and would be accompanied by a Greenway to accommodate recreational activities such as cycling, walking and horse riding. This has been designed as a fenced and gated corridor with a metalled cycleway/footpath and a soft horse track plus safety margins running along the south side of the Main Scheme.

1.2.5 Please refer to Chapter 1: Introduction, Chapter 2: Purpose of the Scheme and Chapter 3a: Scheme information of the ES for additional and full details of the Scheme.

2 Regulation 19 Issues and IEMA Review

2.1.1 The Addendum to the ES must be read in conjunction with the full ES.

2.2 Regulation 19 issues

2.2.1 Under Regulation 19 of *the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999*, the Determining Authority is afforded the right to request further information and evidence respecting to Environmental Statements. The Regulation states that:

"Where the relevant planning authority, the Secretary of State or an inspector is dealing with an application or appeal in relation to which the applicant or appellant has submitted a statement which he refers to as an environmental statement for the purposes of these Regulations, and is of the opinion that the statement should contain additional information in order to be an environmental statement, they or he shall notify the applicant or appellant in writing accordingly, and the applicant or appellant shall provide that additional information; and such information provided by the applicant or appellant is referred to in these Regulations as "further information".

(OPSI, 1999: Regulation 19).

2.2.2 Further information as determined by the above statement has been requested following a review of the ES by the Development, Minerals and Waste Group of ESCC in their capacity as the Determining Authority for the Scheme. These requests are referred to as Regulation 19 issues for the purpose of this Addendum to the ES, and they form the basis for the report.

2.2.3 Regulation 19 issues are established in letters from Statutory Consultees following their external review of the published ES. All correspondence can be found in Appendix A.1 Regulation 19 Letters of this Addendum to the ES. In addition, the Regulation 19 issues have been compiled within Appendix A.2 Schedule of Regulation 19 issues, with appropriate cross reference to the relevant Chapter and Section that addresses the Regulation 19 issue within this Addendum to the ES. All figures, tables and appendices referred to in Appendix A.2 correspond to those contained within the ES.

2.2.4 Specific Regulation 19 issues are addressed within the relevant environmental topic chapters of this Addendum to the ES. General comments are addressed in Chapter 4 General Comments.

2.3 Independent IEMA review

2.3.1 In addition to a review of the ES by the Determining Authority, the ES was subject to an independent review by the Institute of Environmental Management and Assessment (IEMA).

2.3.2 IEMA is an independent, external, not-for-profit organisation established to promote best practice standards in environmental management, auditing and assessment. The involvement of IEMA represents a totally independent appraisal of the BHLR planning application and does not involve any organisation that could have contributed to the preparation of the ES.

2.3.3 Requests for clarification, additional information and general advice following the IEMA review has been addressed alongside the Regulation 19 issues in the Addendum to the ES. Comments arising from the Independent IEMA review are identified in the IEMA Letter (Environmental Statement Review Report), dated December 2007, which can be found in Appendix A.3, and in the Schedule of IEMA Comments in Appendix A.4 which contains appropriate cross reference to the relevant Chapter and Section that addresses the IEMA comment within this Addendum to the ES.

2.3.4 Specific IEMA comments are addressed within the relevant environmental topic chapters following on from the Regulation 19 issues. General comments from IEMA are addressed in Chapter 4 General Comments of this Addendum to the ES.

2.4 Structure of the Addendum to the Environmental Statement

2.4.1 The Addendum to the Environmental Statement is presented in two volumes:

- Volume 1 (this volume) – A document containing responses to the Regulation 19 issues and IEMA comments for each of the Environmental topics that are included in the ES; and
- Volume 2 – a document containing all supporting appendices, to include Figures, for the Addendum to the ES.

Order of topics

2.4.2 The order of the topic chapters within the Addendum to the ES replicate that found in the ES. The topic chapters together with their associated chapter number are as follows:

- Chapter 5: Policy and Planning
- Chapter 6: Travel and Transport
- Chapter 7: Agriculture

- Chapter 8: Geology
- Chapter 9: Water Quality and Drainage
- Chapter 10: Air Quality
- Chapter 11: Noise and Vibration
- Chapter 12: Nature Conservation and Biodiversity
- Chapter 13: Landscape and Visual Effects
- Chapter 14: Cultural Heritage
- Chapter 15: Effects on Pedestrians, Cyclists and Recreation users and Social and Community Effects
- Chapter 16: Combined and Cumulative Effects
- Chapter 17: Conclusions

Chapter structure

2.4.3 Specialist contributions for each environmental topic for the Addendum to the ES follow the standard structure below:

- Introduction
- Regulation 19 issues - summary
- IEMA review - summary
- Consultation
- Regulation 19 Issues
- IEMA Comments
- Conclusions

3 Consultation

3.1.1 The project team have been committed to effective communication and consultation during the development of the Scheme design and in the preparation of the ES and this Addendum to the ES. Please refer to Chapter 1, Introduction, Section 1.4 of the ES for further information relating to consultation to the submission of the Planning Application.

3.1.2 Following the review of the ES by the Determining Authority and the independent, external organisation of IEMA, a process of consultation to determine an agreed and accepted methodology for addressing the Regulation 19 issues and IEMA comments raised was subsequently undertaken.

3.1.3 This consultation comprised of a series of meetings and communications between the Planning Authority, Planning Consultees, Statutory Environmental Bodies (SEBs), ESCC Project Design team and relevant Environmental Topic Consultants.

3.1.4 Full details of all formal consultation meetings are recorded in minutes. Please refer to Appendix B.1 for records of the following:

- Meeting held at County Hall, Lewes on Monday 26th November, 2007, between the Planning Authority, Natural England, the Environment Agency, and David Huskinson Associates in their capacity as Planning Consultees, and ESCC and associates as the Project Design Team: To discuss the ES Chapters of Nature Conservation, Water Quality and Drainage and Landscape and Visual Impact.
- Meeting held at County Hall, Lewes on Friday 30th November, 2007, between the Planning Authority, English Heritage, Arup Consultants and David Huskinson Consultants in their capacity as Planning Consultees and ESCC and associates as the Project Design Team: To discuss the ES Chapter of Cultural Heritage.
- Meeting held at County Hall, Lewes on Monday 10th March 2008, between Natural England in their capacity as Planning Consultee, and ESCC and associates as the Project Design Team: To discuss the ES Chapter of Nature Conservation, with a particular focus on Dormouse issues.
- Meeting held at County Hall, Lewes on Thursday 17th April 2008, between the Planning Authority and English Heritage in their capacity as planning Consultee, and ESCC and associates as the Project Design team: To discuss the ES Chapter of Cultural Heritage.
- Meeting held at Natural England offices, Lewes, on Tuesday 22nd July 2008, between the Planning Authority, Natural England in their capacity as Planning Consultee, and ESCC and associates as the Project Design Team: To discuss the ES Chapter of Nature Conservation.

- Meeting held at County Hall, Lewes on Tuesday 22nd July 2008, between the Planning Authority, the Environment Agency in their capacity as Planning Consultee, and ESCC and associates as the Project Design Team: To discuss the ES Chapter of Nature Conservation.

3.1.5 In addition to these records, chapters for the environmental topics included in the Addendum to the ES make reference to specific consultation undertaken for the purposes of that chapter. This approach ensures that the full consultation process is detailed, and that the structure of the Addendum to the ES is consistent with the ES.

4 General comments

4.1.1 General comments that have been made by the Determining Authority as a Regulation 19 issue, and those that have been made by the external organisation IEMA in their independent review are those that do not directly relate to any specific environmental topic.

4.1.2 General comments are addressed within this Chapter 4 General Comments. Each comment is presented and responded to individually in the following sections.

4.2 Regulation 19 issues

Application area and form of application:

- ***The layout and organisation of documents could do with some attention.***
- ***A contents page for the whole ES would be useful for navigating around the document.***

4.2.1 It is considered that the layout and organisation of the document submitted is in line with best practice, and it is therefore adequate for purpose. It is appreciated however, that supplementary documents such as the Regeneration Statement were submitted erroneously as our package under the umbrella of the ES. These documents should have been submitted as stand alone documents.

4.2.2 Please refer to Appendix C.1 for a Contents Page for the full ES.

Additional plans required. Numbering of plans also needs some attention.

4.2.3 It has been noted that there are some missing and additional figures required for clarification within this Addendum to the ES. Additional and modified figures are given within each topic chapter where required. All new and updated figures are contained within the appendices to this Addendum to the ES.

4.2.4 Table 4.1 below details all Figures contained within this Addendum to the ES.

Table 4.1: Schedule of Figures

Figure No.	Chapter	Title
Figure 10.37 (Omitted in error from the ES)	Chapter 4: General Comments	Construction Noise Levels
Figure 6.6	Chapter 6: Travel and Transport	Travel Speed Do Minimum 2010
Figure 6.7		Travel Speed Do something 2010
Figure 6.8		Travel Speed Do Minimum 2025
Figure 6.9		Travel Speed Do Something 2025
Figure 6.10		Vehicular delays at junctions 2010 Peak – Do Minimum
Figure 6.11		Vehicular delays at junctions 2010 Peak – Do Something
Figure 6.12		Vehicular delays at junctions 2025 Do Minimum
Figure 6.13		Vehicular delays at junctions 2010 Do Something
Figure 8.1 (revised from Figure 8.2 of the ES – omissions added)	Chapter 8: Geology and Soils	Potential sources of contamination
Figure 8.2 and 8.3		Ground Investigation and Phase 2 Contamination Study Proposed Exploratory Hole Location
Figure 9.1	Chapter 9: Water Quality and Drainage	Current outline (100yr+20)
Figure 9.2		Post-Road Construction outline (100yr+20) Layout1
Figure A.1 to A.4	Chapter 10: Air Quality	Contour Plots
Figure 11.1	Chapter 11: Noise and vibration	Belle Hill Calculation receiver locations
Figure 11.2		Ninfield Road Bridge Calculation receiver locations
Figure 11.3		Crowhurst Road and Queensway Calculation receiver locations

Figure No.	Chapter	Title
Figure 12.1	Chapter 12: Nature Conservation	Proposed Pebsham Countryside Park and BHLR Scheme Design
Figures 13.1a and 13.1b	Chapter 13: Landscape and Visual Effect	Sketch Design of Chainage 0 – 300
Figures 13.11 A –D		Visual Impact Rural – Year 0
Figures 13.12 A – D		Visual Impact Urban -Year 0
Figures 13.13 A - D		Visual Impact Rural – Year 15
Figures 13.14 A- D		Visual Impact Urban -Year 15
Figure13.15 A – E		Zone of Visual Influence Environmental Scheme
Figure 13.17 A – Q		Impact upon existing vegetation
Figure 13.22 A – C		Scheme Noise Contours
Figure 13.23 A – K		Additional Habitat Continuity Plan
Figure 6.1	Chapter 15: Effects on pedestrians, cyclists and recreation users and Social and Community Effects	Traffic Model Sectors

4.3 IEMA review

Construction traffic is quantified and associated with specific construction activities. The total traffic is quantified and divided by the anticipated number of working days to provide a figure of average daily construction traffic (Chapter 3B, p 3B-27, Table 3B.10 and paragraph 3B11.4). Whilst this figure is helpful a maximum figure should be provided that would demonstrate the peak in traffic generation.

4.3.1 The construction strategy is an indicative strategy that provides an understanding of how the scheme might be constructed and the consequent impacts of such a strategy. To interrogate it in any detail, however, is unreliable because the Scheme contractor has not yet been appointed. Different contractors are likely to adopt different approaches to the construction of the scheme and schedule elements to suit that approach. On that basis, even if the main elements of the strategy were to remain the same, then the peak daily traffic generation of the construction activity could vary significantly. Consequently, the daily traffic flow estimates in the submitted construction strategy are the best estimate available at this stage.

It would be useful to include the Scoping Opinion in the ES documentation.

4.3.2 The Scoping Opinion was prepared by the Determining Authority in response to the Scoping Report, which was published in March 2006. The Scoping Opinion is provided in Appendix C.2 of this report.

Clarification should be provided on the extent of consultation relating to the scoping report and subsequent inputs to the scoping opinion. Confirmation should be provided that all of the appropriate statutory consultees were provided with an opportunity to comment on the scope of the EIA. Clarification should also be sought on whether non-governmental organisations and affected communities were provided with an opportunity to influence the scope of the EIA.

4.3.3 Additional details on the consultation process that informed the Scoping Opinion can be found in the BHLR EIA Scoping Report (2006), Chapter 3 Consultation.

4.3.4 Section 1.5 of the original ES addresses the Scoping Report.

4.3.5 Consultation with the following Statutory Bodies was sought by the Determining Authority prior to finalising the scoping opinion:

- English Nature
- The Countryside Agency (which combined with English Nature, are now known as Natural England)
- The Environment Agency
- English Heritage
- Rother District Council
- Hastings Borough Council
- The Hastings and Bexhill Task Force
- The Pebsham Countryside Park Steering Group

It is good practice to provide a record of the comments of the consultees and an indication of where and how these have been addressed in the ES.

4.3.6 Please refer to Appendix C.3 for Consultation letters pertaining to the scoping opinion for the ES. The Environment Agency (EA) were the only Statutory Body to provide a written response to the Scoping Report which informed the Scoping Opinion.

It would be helpful to have a clearer idea of the content of the CEMP and therefore the commitments being made.

4.3.7 Section 3B.12 of the ES addresses the Construction Environmental Management Plan (CEMP). It details the that the CEMP would compliant with the requirements of ISO 14001 and that it would dictate how environmental management would be achieved during the construction phase so as to minimise the impact of all activities on the surrounding environment. The section details an outline of specialist procedures to be included in the CEMP. However, it is not possible to have a clearer understanding of the CEMP at this stage in the Scheme design as the production of a CEMP would normally be the responsibility of the successful Contractor and should be prepared prior to the start of construction works on site. The scope and content of the CEMP should be agreed with the Planning Authority with this requirement envisaged to be conditioned as part of the Planning Approval for the Scheme.

Section 11.5.10 (p 11-23) refers to Figure 11.37. This figure is not provided within the ES.

4.3.8 Please refer to Appendix C.4 (Figure 10.37) for this figure which was omitted in error from the ES.

The beneficial and adverse effects are not always reported to an equal extent within the NTS giving the document an unbalanced feel.

4.3.9 Following direct discussions with IEMA (Mott MacDonald, Telephone Communication), it is clear that the main concern is with the reporting of noise and vibration effects. IEMA have stated that they feel this section is not balanced. However, for noise and vibration, the NTS makes the clear conclusion that "the Scheme would be likely to have an overall moderate adverse and significant impact in terms of noise change".

4.3.10 The Applicant maintains that the NTS is not unbalanced, but reports the beneficial, neutral and adverse significant environmental effects for each topic area in a structured and non-technical manner.

5 Policy and Planning

5.1 Introduction

5.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 5 Policy and Planning of the ES for the Scheme.

5.1.2 No issues have been put forward following an external review by IEMA and relating to Chapter 5 Policy and Planning of the ES. Therefore, no discussion will follow in this chapter under the IEMA review heading.

5.2 Regulation 19 Issues – summary

5.2.1 The review by the Determining Authority has raised the query that:

The applicant should provide further reference to the public consultation carried out in 2004 and 2002 in Chapter 5 / Planning Statement – and potentially the extent to which the conclusions and issues arising have informed the Scheme design.

2002 Consultation

5.2.2 Public consultation took place over several weeks in autumn 2002. It was widespread in its scope and was about the future of the communities of Hastings and Bexhill in the context of the Government's (then) recent announcements of major initiative for regenerating the area – the *Five Point Plan* billed as a *"new dawn"* for Hastings. Specific themes under discussion included the Community Strategy, Local Neighbourhood Renewal, a Cultural Strategy, the millennium community proposals and, of relevance to the Scheme, *"Towards a Masterplan for Hastings and Bexhill"*. This latter component was based on masterplanning work carried out by consultants MBM Arquitectes, which looked at how the towns of Bexhill and Hastings should develop in the future.

5.2.3 The consultation was described at the time as "the most extensive ever carried out in the area", with well over 4000 people engaging in it and 35 events in the form of exhibitions, meetings, workshops and briefings.

5.2.4 The Scheme option was shown in the 13 page *Towards a Masterplan* leaflet (Hastings and Bexhill Task Force, SEEDA, 2002). 25,000 copies of the leaflet were printed and widely distributed as well as being covered by media and at the events. The Scheme was shown as part of a wider masterplan concept known as the Country Avenue, a route corridor to be established along the northern boundaries of Bexhill and Hastings and complementing a Sea Avenue route along the coastal

edge of the two towns. A Scheme route, broadly similar to the one currently being promoted, is shown on the main masterplan map and also on the Country Avenue diagram. The leaflet states:

"The (country avenue) idea incorporates the South Coast Multi Modal Study recommendation for a new Bexhill and Hastings Scheme between Bexhill and Hastings which will relieve traffic congestion at Glyne Gap". It was also stated that *"the Country Avenue would enable people to connect more easily around the outskirts. It also provides a framework to cater for the new development needed in the area in the long term."*

5.2.5 There was strong general support for the masterplanning proposals with many detailed comments on the whole range of the specific elements. The Country Avenue received 69% support from the public.

5.2.6 The Scheme was one of a number of elements shown in the Masterplan that were subsequently developed and incorporated into the Task Force Business Plan in 2004.

2004 Consultation

5.2.7 Alongside the consultation with government agencies and local authorities, a comprehensive public consultation was undertaken in the first quarter of 2004. A tabloid was circulated to 65000 addresses in the environs of Bexhill, Hastings and Crowhurst which detailed the options, sought views via a questionnaire and invited the public to attend an exhibition. The exhibition provided more detail about each route option and gave opportunity to raise specific questions with officers. That exhibition visited 7 different venues in Bexhill and Hastings during February 2004 and was attended by more than 4000 individuals.

5.2.8 Following this consultation, an appraisal was then undertaken of seven options (including one suggested during the consultation) using the Government's New Approach to Appraisal (NATA) guidance. Based on the appraisal, the consultation results and further detailed discussions with the Statutory Environmental Bodies, East Sussex County Council's Cabinet agreed the route to be taken forward as the preferred option. This was subject to some design and alignment modifications that had arisen during the consultation process.

5.2.9 Please refer to Chapter 1: Introduction (section 1.4) and Chapter 4: History of the Scheme (section 4.2) of the ES for a detailed review of the consultation arrangements and the extent to which its results influenced the selection of the preferred route.

6 Travel and Transport

6.1 Introduction

6.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 6 Travel and Transport of the ES for The Scheme.

6.2 Regulation 19 issue - summary

6.2.1 Issues raised on the Travel and Transport chapter of the ES cover the assessment of junction capacities, clarification of figures provided, and clarification of the economic assessment reported.

6.3 IEMA review - summary

6.3.1 Issues raised as part of the IEMA review of the Travel and Transport chapter of the ES, cover the assessment of the impact of construction traffic and the security assessment of the Scheme.

6.4 Consultation

6.4.1 Issues raised on the Travel and Transport chapter of the ES and in relation to this Addendum to the ES do not require consultation with the Statutory Authorities.

6.5 Regulation 19 Issues

There are gaps in the assessment of the impacts of additional traffic on local roads within the model area; Junction capacity analysis of the impact of change in traffic flow on the operation of individual junctions is missing.

6.5.1 Each of the junctions in the Bexhill and Hastings urban areas included in the traffic model has been modelled using simulation coding within the SATURN model. Therefore lane allocations, saturation flows and signal staging and timings, where appropriate, have been coded for each junction. In particular signal timings, staging and lane allocations for the Belle Hill/Scheme and Queensway/Scheme junctions were taken from LINSIG assessments and input into the SATURN modelling to ensure consistency and accuracy. The model therefore takes account of individual junction capacities in its assessments and the impact of traffic flow on the operation of the junctions can be taken directly from the SATURN model. Overall the Scheme produces travel time benefits, some of which would occur at junctions within the study area. Figures 4.7 and 4.8 from the Travel and Transport Report compare the

vehicular delays at junctions within the study area for the 2027 AM Peak. These show that vehicle delays significantly reduce at the junctions of Glyne Gap roundabout, A259 Harley Shute Road, and A259/Filsham Road.

6.5.2 In addition, LINSIG assessments have been undertaken, for 2010 and 2025, of the following junctions:

- A259 Belle Hill/Scheme;
- London Road/Scheme; and
- B2092 Queensway/Scheme.

A259 Belle Hill/Scheme:

6.5.3 The Belle Hill LINSIG assessment shows that queuing would occur at peak periods with and without the Scheme. With the Scheme, all approaches to the junction would be under 100% saturated in both years and all time periods except the right turn from A259 King Offa Way onto the Scheme for which flows reach a maximum of 83 passenger car units (pcu), per hour in 2025 Am and pm peak periods. All traffic bar a few right turners would therefore clear the junction in each signal cycle. It should also be noted that the LINSIG assessments have each assumed an all red pedestrian stage at every cycle as a worst case scenario. If this stage is not required there would be additional capacity for vehicle movements.

London Road/Scheme; B2092 Queensway/ Scheme

6.5.4 The LINSIG assessment of the London Road/Scheme junction shows that all approaches in all time periods and years are less than 75% saturated. The LINSIG assessment of the Queensway/Scheme junction also shows that all approaches in all time periods and years are less than 85% saturated.

Has a junction design and appropriate testing been undertaken for the proposed development junction?

6.5.5 Preliminary testing has been carried out on possible signal and roundabout layouts. However, neither the possible development nor the associated junction are part of this application. If proposals are subsequently brought forward for development, any junction would be assessed at that time.

In its own right the link analysis on delay and speed is of limited value in that it contains no reference points that enable the magnitude of the impact to be gauged.

6.5.6 Reference points that enable the magnitude of impact to be gauged are found in Appendix D.1. Figures 6.6 and 6.7 show the 2010 Do Minimum and Do Something average link speeds, and Figures 6.8 and 6.9 show the equivalent data for 2025.

6.5.7 In 2010 and 2025, there are speed increases with the Scheme along A259 through Glyne Gap. In 2025 there are also speed increases along the A271 and B2095, north of the Scheme.

6.5.8 Figures 6.10 and 6.11 of Appendix D.1 show the 2010 AM Peak Do Minimum and Do Something junction delays and Figures 6.12 and 6.13 show the equivalent data for 2025.

6.5.9 In 2010 and 2025, delays at the junctions of A259 with Glyne Gap roundabout, Harley Shute Road and Filsham Road are significantly reduced with the introduction of the Scheme. Delays are also reduced at the junctions of the A2100 with the A271 and B2095 in Battle as traffic transfers to the Scheme.

It is unclear how the scope of the complementary measures was devised.

6.5.10 Whilst the complementary measures have been reflected in traffic modelling and forecasts, they are not part of this application. Whilst a general indication has been given of the type of measures contemplated, the specific proposals would be subject to funding, further consideration, consultation, and in some cases, statutory processes. These measures would be developed under the umbrella of the Local Area Transport Strategy and implemented as part of the Council's Capital Programme.

There is no commentary on why the complementary measures do not include mitigation on those local roads where traffic levels would increase substantially.

6.5.11 The package of complementary measures has not yet been fully developed. It should be noted that, in order to represent a "worst possible case", modelled flows include traffic generated by sites that may be developed along the Scheme corridor. A substantial part of the increase in traffic on some local roads is attributable to that development rather than to the redistribution of traffic attributable to the Scheme.

The proposed junction analysis for junctions at Belle Hill and Queensway are not included in the planning application, but are needed to check that they will operate appropriately.

6.5.12 The Belle Hill junction is on a Trunk Road and the Highways Agency have commented on the analysis (please refer to section 6.5.22 below).

The proposed new junctions and alterations to existing junctions will need to be subject to Stage 1 safety audits.

6.5.13 Stage 1 Safety Audits were carried out in August 2006. They were then revised following slight alterations to the scheme design. The Stage 1 Safety Audits included the proposed new and altered junctions. All issues identified were addressed and reported.

Further clarification required on the alignment of the road with regard to speeds and overtaking.

6.5.14 The alignment of the road (both horizontal and vertical) has been designed in accordance with appropriate design standards for a speed of 70 kph.

More information is required with regard to sustainable transport modes, including:

- ***Information on whether bus operators have agreed to route services along the BHLR?***
- ***Where are bus stops to be located?***
- ***Should the Scheme be contributing to bus services?***
- ***Have ROW been consulted re: the greenway?***
- ***What is being done about cycle provisions on the zigzagging ramp that links the Queensway to the Scheme?***
- ***Information is required in what pedestrian/ cycle improvements will occur on the London Road, along the ridge and on the A259.***

6.5.15 Discussions have been held with bus operators and it is anticipated that operators would chose to route buses via the Scheme.

6.5.16 Bus stops would be provided at the southern end of London Road in conjunction with the bus priority measures which will allow buses to exit and rejoin the Scheme. There would be no bus stops on the rural section of the Scheme because no development accesses the Scheme in this section, and there would be no call for a stop.

6.5.17 The application contains no proposals to operate bus services but it is considered that the Scheme would create direct opportunities for bus operators to run commercial services linking Bexhill to Northern Hastings (including Conquest Hospital). The Scheme would also create opportunities for generally enhanced bus services throughout Hastings.

6.5.18 RoW have been consulted with regards to the Greenway. Please refer to Appendix D.2 for notes of the Greenway and Management meeting held on 13th March 2007, between ESCC and RoW *et al***.**

6.5.19 Neither the zigzag ramp nor the path to which it connects are intended to be used by cyclists. The zigzag path is not designed to provide a link between the Scheme and Queensway, but a pedestrian link between the Greenway and an existing Public Right of Way to the north and parallel to Queensway.

6.5.20 The package of complementary measures has not yet been fully developed but those currently assumed include new and improved pedestrian facilities, as detailed in Section 3A.8 of the ES.

More information is required on how off-site improvements / complimentary measures will be achieved / funded and what benefits are likely to result.

6.5.21 Complementary measures should be funded through the Local Transport Plan and utilising developer contributions (including contributions from any development that might be facilitated by the construction of the Scheme) and would be implemented as part of the Council's Capital Programme.

The HA has concerns regarding the forecast levels of queuing identified at the Belle Hill junction on the A259. The LINSIG analysis provided in support of this junction proposal indicates that significant queues are forecast to exist at the junction in both 2010 and 2025, with particular queuing on the western arm approach. By 2025 queuing problems are identified to occur in all the peak hour scenarios modelled. It is noted that the reconfigured junction layout plans do not adequately cater for the volumes of queuing identified.

6.5.22 The LINSIG analysis shows that queuing at peak periods would arise at Belle Hill in all modelled scenarios including the "Do Minimum" scenario. This, in part, arises from traffic generated by development along the Scheme corridor which is not part of this application but the effects of which have been modelled. The excess of peak period demand over capacity also reflects the general shortfall in capacity on the A27/ A259 corridor in the area (and through East Sussex in general) as evidenced by the fact that the junction would be overloaded at peak times in the "Do Minimum" scenario.

Forecast congestion will mean that there is little scope for the delivery of development above and beyond the identified RSS need.

6.5.23 The traffic modelling used the latest development assumptions as part of its forecast matrix building process. All of the future year networks assumed that the BHLR and its associated complementary measures had been completed. However, although the complementary measures have been taken into account, no allowance was made for any unspecified additional area-wide improvements to encourage non-car travel, which may themselves enhance the impacts of the complementary measures, or through other measures lead to a reduction in junction capacity

problems. To this extent, the modelled situation represented a possible worst case scenario.

6.5.24 A local area transport strategy covering Hastings and Bexhill is currently being developed in partnership with Hastings Borough and Rother District Councils which would develop appropriate measures to improve accessibility and reduce reliance on car use. Work is also ongoing to assess the impacts of additional development as part of the Hastings and Rother LDF processes. This has concluded that significant additional development in the local area may be possible with the provision of additional highway network links.

As the Scheme and future development are closely linked we would strongly suggest that a joint transport strategy covering all of Bexhill and Hastings should be developed, with a view to identifying workable and deliverable measures to increase the proportion of travel by sustainable means and manage down travel, particularly by car.

6.5.25 A local area transport strategy covering Hastings and Bexhill is being developed in partnership with Hastings Borough and Rother District Councils. Consultation was carried out in the Autumn of 2007 with the strategy being adopted in Spring 2008. The Scheme is a key element of this strategy.

Junction capacity analysis is required to demonstrate the impact that the change in traffic flow would have on the operation of individual junctions.

6.5.26 Please refer to sections 6.5.1 to 6.5.4 above.

The 'link analysis' on delay and speed requires further explanation and clarification.

6.5.27 See Figures 6.6 to 6.13 and response in section 6.5.6 above. All figures can be found in Appendix D.1 Figures.

The scope of complimentary measures requires further clarification and explanation as to why they include traffic calming on Woodsgate Park Rd.

6.5.28 It is considered that complementary measures are not part of this application and are therefore not relevant to its determination. Whilst a general indication has been given of the type of measures contemplated, the specific proposals would be subject to funding, further consideration, consultation, and, in some cases, statutory processes. These measures should be developed under the umbrella of the Local Area Transport Strategy and implemented as part of the Council's Capital Programme.

Mitigation measures on local roads where traffic levels would increase substantially requires further explanation.

6.5.29 The above paragraph explains that the complementary measures should be subject to funding, further consideration, consultation, and, in some cases, statutory processes. The measures should be developed under the umbrella of the Local Area Transport Strategy and implemented as part of the Council's Capital Programme.

6.5.30 A number of possible measures have been included in the Most Likely scenario assessed. These potential measures could be made conditions of the planning approval.

The applicant needs to show how pedestrian and cyclist desire lines have been accommodated together with provisions for bus priority.

6.5.31 Pedestrian and cycling surveys were undertaken and informed the development of the Scheme. Please refer to Chapter 15 Effects on Pedestrians, Cyclists and Recreation users and Social and Community Effects.

6.5.32 Provision has been made for bus priority at the southern end of the Scheme where buses would be able to exit to service bus stops and enjoy priority in rejoining the Scheme.

The applicant to confirm that Passenger Transport have been consulted in relation to bus services and Rights of Way (RoW) consulted in relation to proposals for the Greenway as a recreational route.

6.5.33 Both Passenger Transport and ROW have been consulted. Please refer to Appendix D.2 for notes of the Greenway and Management meeting held on 13th March 2007, between ESCC and RoW *et al* and Minutes for four Quality Bus Partnership Meetings held on Friday 9 March 2007, Friday 8 June 2007, Friday 7th September 2007 and Friday 7th December, 2007. In addition, Appendix D.2 contains the Hastings and St Leonards Quality Bus Partnership Progress report for 2006/2007 and the Action Plan for 2007/8 – 2009/10.

The applicant to confirm the scope of improved bus services proposed.

6.5.34 Please refer to section 6.5.16 above for further details.

The applicant to confirm the extent of improvements to pedestrian/cyclist provision along London Road, the Ridge and A259.

6.5.35 Please refer to section 6.5.19 above for further details.

Nothing has been done to address the issues of a bottleneck at the eastern end of the Scheme along The Ridge north of Hastings.

6.5.36 Congestion along the Ridge is a current problem. It is accepted that the Scheme would worsen conditions on the Ridge. It should be noted, however, that the Highways Agency have been directed by the Secretary of State to develop a scheme to link the northern end of the B2092 Queensway with the A21 trunk road. As yet there is not a preferred route for this scheme, but the proposals would improve the flow of traffic through this area, addressing existing problems and mitigating some of the effects of the BHLR. ESCC would monitor the combined effects of this scheme and the BHLR and would assess what additional measures might be appropriate in the light of that monitoring.

The applicant is advised that the economic case forwarded requires clarification on how benefits would be split between business and consumer users – in particular setting out what the benefits are, rather than calling them "TUBA benefits" and "COBA benefits". In addition some clarification / investigation of the following would also be useful: What are DIADEM parameters?; Why are indirect tax revenues so high?; Why are accident benefits so high?

6.5.37 Table 5.1 in the Traffic and Transport Report (ESCC, 2007), includes the split of TUBA benefits between consumer and business users. The table is shown as Table 6.1 below taking on board the comments made regarding developer contributions on the Economic Assessment Report.

6.5.38 DIADEM is software that allows the variable demand modelling required by WebTAG, the Department for Transport's Transport Analysis Guidance, to be undertaken. It requires various parameters to be input for each variable demand response and these are discussed in WebTAG unit 3.10.3.

6.5.39 The indirect taxes consist of changes in tax revenue for Central Government based on changes in vehicle kms as a result of the Scheme. As a result of the implementation of the Scheme, vehicle numbers across the network increase in all time periods in both modelled years, as reported in Tables 6.1 and 6.2 of the Traffic Forecasting Report.

6.5.40 Table 6.2 shows the vehicle kms with and without the Scheme. This increase leads to additional fuel tax revenue for Central Government which results in the indirect tax revenues within TUBA.

Table 6.1: TUBA Results

	£000's
Consumer User Benefits	75,333
Business User Benefits	136,041
Private Sector Provider Impacts	2,338
Developer Contributions	**-14,471**
Carbon Benefits	**-2,568**
Present Value of Benefits (PVB)	199,241
Scheme Costs	**95,103**
Developer Contributions	**-14,471**
Indirect Tax Revenue	-1**8,863**
Present Value of Costs (PVC)	61,769
Net Present Value (NPV) (PVB-PVC)	134,904
BCR (PVB/PVC)	3.2

All entries are present values discounted to 2002 in multiples of thousand pounds, in 2002 prices

Table 6.2: Comparison of vehicle kilometres

	Vehicle kms
Do Minimum 2010	4,450,084
Do Something 2010	4,722,470
Do Minimum 2025	5,320,585
Do Something 2025	5,515,501

6.5.41 As a result of the Scheme there is a reduction of 735 accidents across Bexhill and Hastings between 2010 and 2069, an average of 12 accidents per year. Table 6.3 below shows that the local accident rate through Glyne Gap is higher than the default rates for this type of road. The transfer of traffic from Glyne Gap and the

other east-west routes onto the Scheme modelled with a default accident rate lower than existing rates on the alternative routes therefore results in accident benefits.

6.5.42 There is an error in the calculation of the base year accident rates within the ES document. Table 6.3 below shows the corrected local accident rates and Table 6.4 shows the revised economic benefit calculations.

Table 6.3: Accident Rate Comparison

	Local Accident rate (pia/mvkm)	COBA Default Accident Rate (pia/mvkm)
A271	**0.22**	**0.226**
B2095	**0.31**	**0.297**
Henleys Down	**0.09**	**0.297**
A259 Glyne Gap	**0.60**	**0.226**
Scheme – Bexhill End		**0.297**
Scheme – Hastings end		**0.102**

Table 6.4: Overall Scheme BCR

Benefits/Disbenefits/Costs	Most Likely £000's
TUBA Benefits	**199,241**
COBA Benefits	**28,542**
Noise Benefits	**-1,574**
Present Value of Benefits (PVB)	226,209
Present Value of Costs (PVC)	61,769
Net Present Value (NPV)	164,440
BCR (PVB/PVC)	3.7

All entries are present values discounted to 2002, in 2002 prices

6.6 IEMA Review Comments

Clarification should be provided on the basis for concluding that the effect on safety as a result of construction traffic generated by the proposal is "slight

adverse" (6.5.3). This is particularly important as no significance levels are predicted for operational safety impacts.

6.6.1 The main construction compound would be located on the B2092 Queensway. In 2010 without the Scheme, AADT traffic is predicted to be 12,000 vehicles. The 62 construction vehicles and 205 additional traffic movements to the construction compound therefore equate to less than 2.5% of the AADT and for this reason are considered to have only a slight adverse impact.

Table 6.5 includes a security assessment which compares the existing route with the Scheme route. Indicators for each of the Schemes are assessed as poor, moderate or high. These terms should be defined to ensure that the reader is clear what the outcome of the assessment is, e.g. should moderate be viewed as positive or negative, how does poor differ from moderate and high?

6.6.2 The security assessment summarised in Table 6.5 follows the guidance given in WebTAG unit 3.4.2 which splits security indicators into three levels of response, namely poor, medium and high. WebTAG unit 3.4.2 Table 1 provides details of what each level of security equates to for each security indicator. It is re-produced by way of a summary as table 6.5 below:

Table 6.5: Security Indicators for Public Transport Passengers

Security Indicator	Poor	Moderate	High
Site perimeters, entrances and exits	Unmarked or poorly marked site perimeters, exits etc. Use of solid walls or similar.	Attention to boundary and exit marking, but otherwise unfavourable use of materials.	Clearly marked site perimeters/exits. Use of open fencing rather than solid walls.
Formal surveillance	No CCTV system in place. Design discourages staff surveillance and isolates passengers.	CCTV system in place, but number, location of system not optimal. Poor design which discourages staff surveillance.	Effective CCTV system in place. Design to encourage staff surveillance and group passengers.
Informal surveillance	Poor use of materials (fencing etc) and design. Poor visibility from site surrounds. Very isolated from retailers or other human activity.	Unfavourable use of materials (fencing etc) but reasonable proximity of retailers or other activity.	Positive use of materials (fencing etc) and design to encourage open visibility from site surrounds. Encouragement or proximity of retailers or other activity.
Landscaping	Landscaping features (design, plants etc) inhibits visibility and encourages intruders	Evidence of some positive use of landscaping features (design, plants etc), but more measures needed to contribute	Positive use of landscaping features (design, plants etc) to contribute to visibility and deter intruders.

Security Indicator	Poor	Moderate	High
		to visibility and deter intruders.	
Lighting and visibility	Poor design including recesses, pillars, obstructions etc which hinder camera/monitor view. Poor or no lighting in passenger areas at night when facility open. No or poor lighting on any signing, information or help points.	Design includes some recesses but not problematical to camera/monitor view. Lighting in passenger areas at some, but not all times when facility open. Lighting not to daylight standard. Attention to lighting on signing, information and help points.	Good design to avoid recesses and facilitate camera/monitor view. Lighting to daylight standard in passenger areas when facility open. Attention to lighting on signing, information and help points.
Emergency call	No or very poor provision of emergency phones, help points and public telephones. Little provision or information on emergency help procedures	Basic provision of emergency phones, help points and public telephones. Improvements to these and on emergency help procedures nee	Good provision of emergency phones, help points, public telephones and information on emergency help procedure

6.7 Conclusions

6.7.1 It is felt that the Regulation 19 Issues raised on the Travel and Transport chapter of the ES have been fully addressed within this chapter in the Addendum to the ES. The Regulation 19 issues cover the assessment of junction capacities, clarification of figures provided, and clarification of the economic assessment reported.

6.7.2 The SATURN model used takes account of individual junction capacities in its assessment, so that the impact of traffic flow on the operation of the junctions can be taken directly from the model. Overall the assessment shows that the Scheme produces travel time benefits, some of which would occur at junctions within the study area.

6.7.3 Additional information has been provided to clarify certain issues such as the locations of bus stops and the consultation process.

6.7.4 Issues raised as part of the IEMA review of the Travel and Transport chapter of the ES are also considered to be addressed within this chapter. The comments cover the assessment of the impact of construction traffic and the security assessment of the Scheme.

6.7.5 Clarification of the affect on safety as a result of construction traffic generated by the proposal as being assessed as “slight adverse” is given, with the judgement that in 2010 without the Scheme, AADT traffic is predicted to be 12,000 vehicles, so that the 62 construction vehicles and 205 additional traffic movements to the

construction compound equate to less than 2.5% of the AADT. Table 6.5 summarises the Security Indicators for Public Transport Passengers to give clarification of the security assessment for the Scheme.

7 Agriculture

7.1 Introduction

7.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 7 Agriculture of the ES for the Scheme.

7.1.2 No Regulation 19 issues have been put forward following the Determining Authority's review relating to the Agriculture chapter of the ES. Therefore, no discussion will follow in this chapter under the Regulation 19 issues heading.

7.2 IEMA Review - summary

7.2.1 The IEMA review has identified two issues arising from Chapter 7 of the ES, Agriculture and Forestry. These are:

- Table 7.1 provides criteria for evaluating the significance of impacts. Information identifying the basis for these classifications would increase the transparency of the assessment; and,
- Clarification should be provided on the likely rate of success of restoring land to agricultural use disaggregated to the various land quality classifications. In the event that there is a significant risk to successful restoration a reasonable worst case assessment should be provided.

7.3 Consultation

7.3.1 No formal consultation was undertaken for the purposes of this Addendum to the ES.

7.4 IEMA Review

Table 7.1 provides criteria for evaluating the significance of impacts. Information identifying the basis for these classifications would increase the transparency of the assessment.

Significance of the Impacts on Agricultural Land Quality.

7.4.1 There is no standard set of criteria available to assess the significance of the loss of agricultural land quality as stated in Chapter 7 of the ES. The Design Manual for Roads and Bridges (DMRB) contains guidance for the assessment of agriculture in Volume 11, Section 3 *Environmental Assessment Techniques* Part 6 Land Use. This guidance was however produced within the national policy framework of Planning

Policy Guidance (PPG) Note 7 and at a time when the Ministry of Agriculture Fisheries and Food (MAFF) were statutorily consulted on applications likely to involve the loss of more than 20ha of the "best and most versatile" agricultural land.

7.4.2 The national policy framework has changed significantly since the introduction of PPG 7 and the DMRB Land Use section. Under Planning Policy Statement (PPS) 7 introduced in 2004, there are no definitive criteria for the assessment of impacts of development on agricultural land quality and MAFF are no longer consulted on a statutory basis on developments involving the loss of agricultural land.

7.4.3 The responsibility for determining the importance to be attached to agricultural land quality, as stated in PPS 7 Paragraph 29 now lies with the local authority:

" It is for the local planning authorities to decide whether best and most versatile agricultural land can be developed, having carefully weighed the options in the light of competent advice".

7.4.4 The significance of the loss of agricultural land within PPS 7 is therefore considered at a local level and on this basis the significance of the loss of the agricultural land arising from the Scheme is assessed to be of local importance.

7.4.5 In terms of the areas of loss of land that have been allocated within the categories of significance, the 20ha area used to determine a moderate level of significance does relate to the historical cut-off for statutory consultation with MAFF within the PPG 7 and DMRB framework. Whilst the national policy framework has changed, the DMRB provides the guidance framework for the assessment of this Scheme, and in the absence of any definitive criteria, this 20ha threshold is commonly still used as a criteria for assessment as described in Chapter 7 of the ES.

7.4.6 With regard to the 50ha threshold within Table 7.1 to describe a loss of "best and most versatile "land that is of major local significance, this can be related to the DEFRA criteria used to describe farming structure in the National Agricultural Statistics. Within these statistics, a farm holding more than 50ha in size is considered to be a medium size farm unit, with a farm holding of more than 100ha a large agricultural holding. The assessment of the loss of 50ha of the "best and most versatile" agricultural land to be of major adverse significance is therefore equivalent the loss of a medium sized farm holding.

7.4.7 This is consistent with the criteria for the assessment of the impacts on farm holdings where a major adverse impact occurs if an existing full-time farm business is rendered unworkable in its current form. It is likely, with the exception of certain intensive livestock and horticultural enterprises, that the loss of a full-time farm holding, with at least one full time farm employee, would affect a holding that comprises in excess of 50ha of land. This is the case on this scheme where the full-time farm holdings affected comprise between 65 and 141 hectares of land.

Clarification should be provided on the likely rate of success of restoring land to agricultural use disaggregated to the various land quality classifications. In the event that there is a significant risk to successful restoration a reasonable worst case assessment should be provided.

7.4.8 Studies have been undertaken to investigate the success of reclamation schemes mainly within the minerals industry including, for example, the DoE study in the 1990's entitled The Reclamation of Mineral Workings to Agriculture (DoE, 1996).

7.4.9 This study culminated in the Production of the DoE Guidance on Good Practice in the Reclamation of Mineral Workings to Agriculture (DoE 1996). This guidance and the MAFF Soil Handling Guide (MAFF, 2000) identify the key principles of good practice in agricultural reclamation that are referred to in Chapter 7 of the ES. These include:

- The survey and identification of soils to be handled on the site, including topsoil and subsoil resources. This survey work has already been carried out along the Scheme alignment and the main soil types identified;
- Ensure that the best quality soil materials are used for the best quality reclamation. This would include the use of the grade 2 and 3a soil materials in the reclamation of the areas identified for agricultural reclamation;
- The handling of soil materials in appropriate conditions. Different local authorities have their own preferred method of controlling such movements. Irrespective of the method chosen, the soils should not be moved when they are wet as they are liable to serious damage that can affect the quality of the agricultural reclamation process;
- The use of the most appropriate soil handling machinery. For high quality reclamation, the dump truck and back acter method is recommended, as this is considered to minimise damage to soil materials during soil handling operations;
- Wherever possible, strip and move the soils to their final restoration location, without having to put them into store. This reduces the risk of soils being damaged, mixed or lost during the storage programme; and,
- If soils are stored:
    - Separate topsoil and subsoil stores should be provided;
    - Minimise the length of time that soils are in store; and,
    - Locate heaps so as to avoid potential damage to them.

7.4.10 The success of the reclamation on individual sites is particularly related to the availability of pre-working information, the careful planning of the soil movements, the monitoring of the soil movements on site and the planning and careful monitoring and implementation of post-restoration management. The production of

the Soil Handling and Management Strategy would include the detailed planning of the soil movements in these areas and include a strategy for their monitoring during the construction and restoration process.

7.4.11 The difficulty with attempting to assess the risk to successful reclamation on the basis of land quality is that the individual Agricultural Land Classification (ALC) grades include more than one soil type, and it is the characteristics and the limitations associated with the different soil types that determine the best conditions for reclamation. The potential for successful reclamation is therefore considered firstly in terms of the different soil materials that have been identified along the route and the risk associated with each of these soil types. The effect on the different soil types is then discussed in the context of the distribution of the ALC grades identified along the route.

7.4.12 There are two main soil types that have been encountered along the route of the Scheme:

- Lighter textured freely drained light loamy soils; and
- Silty soils overlying slowly permeable clays at varying depths.

7.4.13 The main consideration with the lighter textured freely drained soils is their susceptibility to a slight doughtiness limitation in this location. It is important to ensure that the maximum depth of the topsoil and subsoil resources are stripped and restored. The recognised standard depth of soil profile to be restored for high quality agricultural land is 1.2m. This depth of restoration provides a guaranteed fully rootable and water retentive profile for the full range of agricultural crops associated with high quality agricultural land to be grown, irrespective of the underlying material on which the soil profile is restored. The replacement of the full depth of the soil profile in the restoration of these soils would ensure that water holding capacity of the soil profile is maintained.

7.4.14 There are more potential difficulties associated in the successful reclamation of the heavier textured silty soils. These stem mainly from their greater susceptibility to soil wetness and to soil damage during their stripping, movement and restoration. Again, it is important to survey the soils in the area to be stripped in detail to identify the depths and textures of the topsoils and subsoils. It is then particularly important to ensure that two key principles are implemented with regard to these soils:

- Use the most appropriate soil handling machinery. For high quality reclamation, the dump truck and back acter method is recommended, as this is considered to minimise damage to soil materials during soil handling operations; and,
- Ensure that these soils are worked in suitable soil handling conditions.

7.4.15 With regard to agricultural land quality, the light textured soil materials comprise the highest quality land along the route, being mainly grade 2 with some smaller areas of grade 3a. These soils, if stripped, moved and restored in accordance with the proposals and to a minimum depth 1.2m have the potential to be restored to a quality capable of being used to a similar agricultural standard as at present.

7.4.16 The heavier textured silty soils generally comprise the lower quality agricultural land along the route and are limited to a varying degree by susceptibility to soil wetness caused by the presence of a slowly permeable clayey subsoil horizon. These soils comprise a mixture of a limited area of grade 3a land, with a greater proportion of these soils graded 3b.

7.4.17 The success of the reclamation of these soils would depend on the monitored implementation of the Soil Handling and Management Strategy. There may be opportunities, during the construction of the Scheme and identified by detailed surveys, to substitute heavier clayey subsoils with lighter materials that would enhance the potential reclamation of this soil type. It is more likely, however, compared to the lighter textured sandy soils, that there may be an overall reduction in the quality of the land on these heavier textured more poorly drained soils, due to the difficulties associated with handling and restoring these materials. This is likely to be a short term impact only. Provided the restoration carefully follows the guidance described above, experience shows that the prospects of achieving a successful restoration are good.

7.5 Conclusions

7.5.1 The IEMA comments identified two issues which are the provision of additional information on the basis for the significance criteria relating to agricultural land quality and the suitability for the different soil materials on site for agricultural reclamation.

7.5.2 This Addendum to the ES has explained in further detail the difficulties in defining criteria relating to agricultural land quality as well as how the areas of land loss relate to historical thresholds and current DEFRA statistical categories.

7.5.3 This chapter has also considered the potential for agricultural reclamation on this site in terms of the different soil types encountered along the route and their particular physical characteristics and requirements for successful reclamation.

7.5.4 Two main soil types have been identified along the route of the Scheme. The main consideration with the lighter textured freely drained soils identified is their slight susceptibility to a doughtiness limitation in this location, so that the replacement of the full depth of the soil profile in the restoration of these soils is required to ensure that the water holding capacity of the soil profile is maintained.

7.5.5 For the heavier, textured silty soils, they have a greater susceptibility to soil wetness and to soil damage during their stripping, movement and restoration. It is particularly important to ensure that the two key principles of using the most appropriate soil handling machinery and ensuring that these soils are worked in suitable soil handling conditions, are implemented. The success of the reclamation of these soils would depend on the monitored implementation of the Soil Handling and Management Strategy. However, provided the restoration carefully follows the guidance described above, experience shows that the prospects of achieving a successful restoration are good.

8 Geology and Soils

8.1 Introduction

8.1.1 This Chapter of the BHLR ES addendum provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 8 Geology and Soils of the ES for the Scheme.

8.2 Regulation 19 Issues - summary

8.2.1 The Regulation 19 issues relating to Geology and Soils required further information relating to the historical land use of the Scheme, associated contamination potential and development of source - pathway - receptor conceptual models to identify potential pollution linkages.

8.2.2 The Regulation 19 review also required further commentary on the absence of site specific ground investigation data.

8.3 IEMA review - summary

8.3.1 The IEMA review identified that assessment of contamination on the site is the result of a desktop/walkover studies. Chemical analysis has not been undertaken to determine the significance of any contamination that may be present. IEMA require a reasoned justification for not undertaking the investigations to enable the information to be considered within the ES and whether the absence of such information leads to uncertainty relating to the contaminated land effects.

8.4 Consultation

8.4.1 No formal consultation was undertaken for the purposes of this Addendum to the ES.

8.5 Regulation 19 issues

No comprehensive site history section is present within the chapter….. Reference is made in 8.3.28 to historical ordnance survey maps for one section of the site suggesting that a site history review may have been undertaken previously. A site history section is essential for assessing ground contamination and is normally provided within a soils and geology chapter within an ES….. All of the assessment on sources has been provided with respect to current operations in the region of the proposed development.

8.5.1 As part of the ES, Landmark Ltd. was commissioned to provide an Envirocheck report, including historical maps of the area. The maps show the area of the Scheme from the first available edition of the Ordnance Survey (OS) dated 1875 to the latest plan issued in 2000. The site history has been deduced from the plans and is summarised in Tables 8.1 to 8.3 which are presented in Appendix E.1.

8.5.2 This was followed by a site walkover to further categorise the site, its buildings, the surrounding environment and validate information received through the desk study and consultation with the Contaminated Land Officers of Rother District Council and Hastings Borough Council. An assessment of the presence of asbestos and other hazardous materials was performed and any evidence indicating land contamination noted. Information gained during the desk study and walkover was used to develop the initial site conceptual model described below.

8.5.3 In summary the site is located in a predominantly rural area with no significant industrial history. The southern end of the Scheme has been mainly residential with localised areas of industrial activity including Corporation Yard and a former Coal Yard which has subsequently been used for small scale light industrial activities. The general area is divided by the former Crowhurst, Sidley and Bexhill Branch railway line which was operational from 1902 until the 1960s when it was dismantled.

8.5.4 The remaining part of the route traverses mainly agricultural land, including Glover's Farm and Adam's Farm, and crosses Combe Haven, Watermill Stream, Powdermill Stream, a number of drainage ditches, tracks and the Tunbridge Wells (or London) to Hastings main railway line at its eastern end. Little change is evident along the route from the earliest maps.

8.5.5 In addition to the historical maps, other potential sources of contamination were identified either from the Envirocheck report, site walkover or from information provided by the local authority. This information is included in Chapter 8 of the main ES.

No detailed stratigraphy is provided, such as depths, level, thickness of strata and locations of Made Ground.

8.5.6 Information relating to the geology can be found in Section 8.3 of the main ES including an extract from the British Geological Survey map.

8.5.7 The assessment of geology of the site and ground conditions has been deduced from the following available information:

- Owen Williams, Ground Water Monitoring, 30th March 2006 to 12th October 2007;
- Owen Williams, Preliminary Geotechnical Report, Bexhill to Hastings Scheme, Preliminary Design, July 2006;

- May Gurney, Final Factual Report – Issue No.1. Geotechnical and Environmental Site Investigation, July 2006;
- Norwest Holst Limited, Final Factual Report, October 1993; and,
- East Sussex County Council, Ground Investigation, 1992.

8.5.8 The following table (Table 8.4) provides a summary of anticipated geology likely to be encountered by the Scheme.

Table 8.4: Summary of Anticipated Geology for Bexhill to Hastings Scheme

Geological Unit	Description	Anticipated thickness indicated by previous Ground Investigation (Owen Willams, 2006)	Hydrogeology
Topsoil (Recent)	Firm to soft brown slightly sandy GRAVEL and CLAY.	0.1m to 0.6m thick.	-
Made Ground (Recent)	Black / brown clays, sands and gravels. Gravels comprise flints, chalk, slag, ash, steel, glass, plastic, metal, brick and wood.	0.3m to 3.5m thick in all locations during the ESCC 1992 Ground Investigation. Norwest Holst borehole logs indicate up to 5.95mbgl (BH182) to NE of alignment near Upper Wilting Farm.	-
Alluvium (Quaternary)	Firm to soft brown organic peaty CLAY and SILT. A desiccation crust of firm clay is often encountered at the surface.	Encountered to a maximum depth of 10.2mbgl in BH15 (May Gurney, 2006).	Variably permeable minor aquifer.
Tunbridge Wells Sand (Cretaceous)	Siltstones with inter-bedded mottled clays and sandstones, which weather to SANDS and SILTS.	Encountered to a maximum depth of 16mbgl (-12maod) in BH3 (May Gurney, 2006), along the western part of the proposed alignment. Regionally thought to be 45m to 141m thick.	Variably permeable minor aquifer with intermediate leaching potential.
Wadhurst Clay (Cretaceous) Unweathered	The unweathered forms are interlaminated shales, mudstones and siltstones (heavily over-consolidated) with some beds of	Encountered to a maximum depth of 10.5mbgl (30maod) in BH26 (May Gurney, 2006). Regionally thought to be 30m to 70m thick.	Negligibly permeable non-aquifer.

Geological Unit	Description	Anticipated thickness indicated by previous Ground Investigation (Owen Willams, 2006)	Hydrogeology
	sand, nodular clay-ironstone and thin shelly limestone.		
Weathered	These weather to stiff sandy CLAYS and gravely SANDS. Shear Surfaces are common within the upper 2-3m.		
Sand beds in Wadhurst Clay - Tilgate stone (Cretaceous)	Comprise poorly cemented fine-grained sandstones and siltstones. Occasionally there are more calcareous horizons forming massive strong beds.		Variably permeable minor aquifer with low leaching potential.
Ashdown Beds (Cretaceous)	Moderately weak, thinly laminated to thickly bedded mudstone interbedded with fine-grained sandstones and siltstones. Weather to stiff CLAYS and SILTS with some dense sands and gravels.	Encountered along the majority of the route, to a maximum depth of 35mbgl (BH28 -6.5maod and BH30 -2maod) (May Gurney, 2006). Regionally thought to be 150m to 210m thick.	Variably permeable minor aquifer with intermediate leaching potential.
Clay in Ashdown Beds - Fairlight Clays (Cretaceous)	More clayey facies; dark grey Shales and mudstones. Shear surfaces occur.		

A conceptual site model discussing potential source-pathway-receptor linkages is not included within the ES…. The report provides some ad-hoc discussion on sources, receptors and a few plausible pollutant linkages, but the sum total of this work does not form a CSM.

8.5.9 A conceptual site model is provided in Table 8.6 of this Chapter.

8.5.10 The primary regulatory regime under which contaminated land is managed in the UK is Part IIA of the Environmental Protection Act (EPA), 1990. The framework for the assessment of potential land contamination adopted in this report is based on current guidance documents regarding the implementation of Part IIA of the EPA and the assessment of potentially contaminated land, with particular reference to: *Contaminated Land Research Report (CLR) 8; CLR 11; Construction Industry Research and Information Association (CIRIA) Report C552; and British Standard (BS) 10175:2001.*

8.5.11 A key element of undertaking an environmental risk assessment is the development of a conceptual model that describes the environmental features of the route options together with the expected interaction of potential contamination sources with the environment. This is done by undertaking a Source – Pathway – Receptor analysis of the site:

- Sources (S) are potential or known contaminant sources e.g. the former industrial areas.
- Pathways (P) are environmental systems thorough which a contaminant could migrate e.g. air, groundwater.
- Receptors (R) are sensitive environmental receptors that could be adversely affected by a contaminant. e.g. construction workers, groundwater resources.

Where a source, relevant pathway and receptor are present a pollutant linkage is considered to exist whereby there is a circumstance through which environmental harm could occur and a potential environmental liability is considered to exist.

A summary of potential sources, pathways and receptors relevant to the construction corridor are described below and given numeric codes for identification (e.g. S1 – Source 1).

8.5.12 Potential Sources of Contamination:

S1: The southern end of the proposed Scheme has historically been occupied by railway land. Contaminants associated with this land use can include: ash, clinker, coal, hydrocarbon fuels and lubricants, solvents, heavy metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAH), phenols, herbicides and pesticides, creosote and other timber treatment products.

In this case, it appears the site was occupied by a rail track as opposed to sidings, carriage sheds or other more intensive uses. Therefore, the extent of any contamination is likely to be limited due to an absence of long term industrial contamination sources. The site itself is not likely to be heavily contaminated as a result of its former use.

S2: Land bordering the alignment has been predominantly residential with some small scale industrial operations or waste disposal activities. Such activities have the potential to give rise to contaminative ground conditions which may have migrated into the portal area.

Potential contaminants associated with these activities include fuel oils, lubricants, general hydrocarbons, coal tars, cyanides, ammoniacal compounds, solvents, heavy metals, PAH and PCBs.

S3: The remainder of the Scheme lies in a rural area and no significant sources of contamination have been identified directly on the alignment. However, there is potential for unknown sources of contamination to be present.

8.5.13 Potential Migratory Pathways

P1: Human uptake through direct contact with contaminated soils or groundwater including ingestions, inhalation and dermal contact.

P2: Horizontal and vertical migration of contaminants via groundwater.

P3: Migration of contaminants via surface water.

P4: Direct contact of soils with construction materials.

8.5.14 Potential Receptors at Risk:

R1: Groundwater in underlying minor aquifers.

R2: Surface waters present across the Scheme.

R3: Workers involved in construction are potential receptors, as are future maintenance workers (e.g. for drainage maintenance or soft landscaping).

R4: Future end users.

R5: Construction materials.

R6: Adjacent sites and their users.

8.5.15 The Contaminated Land Risk Assessment methodology used for this assessment is based *on CIRIA C552 (2001) Contaminated Land Risk Assessment – A Guide to Good Practice*, in order to quantify potential risk via risk estimation and risk evaluation, which can be adopted at the Phase I stage. This will then determine an overall risk category which can be used to identify likely actions. This methodology uses qualitative descriptors and therefore is a qualitative approach.

8.5.16 The methodology requires the classification of:

- the magnitude of the **consequence** (severity) of a risk occurring, and
- the magnitude of the **probability** (likelihood) of a risk occurring.

8.5.17 Please refer to Appendix E.3 for details on the classification of consequence and probability (tables E.2.1, E.2.2 and E.2.3).

8.5.18 This relationship can be represented graphically as a matrix, shown as Table 8.5 below:

Table 8.5: Overall Contamination Risk Matrix

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High likelihood**	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate risk	Low risk
	Low likelihood	Moderate risk	Moderate risk	Low risk	Very low risk
	Unlikely	Low risk	Low risk	Very low risk	Very low risk

8.5.19 The risk assessment process is based on guidance provided in CIRIA C552 (2001) *Contaminated Land Risk Assessment – A Guide to Good Practice.* A summary of this guidance is provided in Appendix E.1.

8.5.20 Table 8.6 below summarises the likely pollution linkages which exist on the Scheme and presents the likely consequence and probability in relation to the descriptions provided above.

Table 8.6: Conceptual Site Model for Scheme

Source	Pathway	Receptor	Consequence	Probability	Risk Category	Comments
S1 Contaminants associated with railway land	P1 Human uptake (ingestion, dermal contact, inhalation)	R3 Construction and maintenance workers	Medium	Likely	Moderate	Impacts can be mitigated through the provision of PPE, good practice during construction, soil disposal or remediation as necessary.
		R4 Site end users	Medium	Unlikely	Low	The site would effectively be capped with hardstanding.
	P2 Horizontal and vertical migration of contaminant via groundwater	R1 Groundwater	Mild	Low Likelihood	Low	The site itself is unlikely to be a significant contamination source although contaminated made ground may be encountered which could leach contaminants to groundwater. There is also potential for pollution through spillages/leaks of plant during the construction works. This risk can be mitigated by provision of bunded storage facilities.
		R2 Surface water	Mild	Low Likelihood	Moderate	There is potential for significant contamination source although contaminated made ground may be encountered which could leach contaminants to surface water.

Source	Pathway	Receptor	Consequence	Probability	Risk Category	Comments
	P3 Migration through surface waters	R7 Sensitive ecological features	Medium	Low Likelihood	Moderate	The site itself is unlikely to be a significant contamination source although contaminated made ground may be encountered which could leach contaminants to surface water. There is also potential for pollution through spillages/leaks of plant during the construction works. This risk can be mitigated by provision of bunded storage facilities.
	P4 Direct contact of soils with construction materials	R5 Construction materials	Medium	Likely	Moderate	Made ground soils and undisturbed soils have the potential to contain deleterious substance (for example sulphates that can damage concrete or hydrocarbons that can taint water supply pipes) – following quantitative assessment, design measures can be drawn up to mitigate such risks.
S2 Contaminants associated with industrial land bordering alignment	P1 Human uptake (ingestion, dermal contact, inhalation)	R3 Construction and maintenance workers	Medium	Likely	Moderate	Impacts can be mitigated through the provision of PPE, good practice during construction, soil disposal or remediation as necessary.
		R4 Site end users	Medium	Unlikely	Low	Majority of the site would effectively be capped with hardstanding.

Source	Pathway	Receptor	Consequence	Probability	Risk Category	Comments
		R5 Adjacent sites and their users (residential land)	Medium	Likely	Moderate	Dust and odours are the most likely means through which contaminants could impact near neighbours. Good practice during construction to control dust emissions should be able to reduce this risk to Low.
	P2 Horizontal and vertical migration of contaminants via groundwater	R1 Groundwater	Medium	Low	Moderate	Surrounding land may be contaminated as a result of previous uses. Groundwater contamination from surrounding land may have impacted soil and groundwater within the site.
S3 Rural/agricultural land containing unknown contamination	P1 Human uptake (ingestion, dermal contact, inhalation)	R3 Construction and maintenance workers	Medium	Unlikely	Low	Impacts can be mitigated through the provision of PPE, good practice during construction, soil disposal or remediation as necessary.
		R4 Site end users	Medium	Unlikely	Low	Majority of the site would effectively be capped with hardstanding.
		R5 Adjacent sites and their users (residential land)	Medium	Unlikely	Low	Dust and odours are the most likely means through which contaminants could impact near neighbours. Good practice during construction to control dust emissions should be able to reduce this risk.

Source	Pathway	Receptor	Consequence	Probability	Risk Category	Comments
	P2 Horizontal and vertical migration of contaminants via groundwater	R1 Groundwater	Medium	Unlikely	Low	Surrounding land may be contaminated as a result of previous unknown uses. Groundwater contamination from surrounding land may have impacted soil and groundwater within the site although this is likely to be relatively localised and small scale.
	P3 Migration through surface waters	R7 Sensitive ecological features	Medium	Low Likelihood	Moderate	The site itself is unlikely to be a significant contamination source although unknown contaminated materials may be present which could leach contaminants to surface water. There is also potential for pollution through spillages/leaks of plant during the construction works. This risk can be mitigated by provision of bunded storage facilities.
	P4 Direct contact of soils with construction materials	R5 Construction materials	Medium	Low likelihood	Moderate	Made ground soils and undisturbed soils have the potential to contain deleterious substance (for example sulphates can damage concrete; hydrocarbons that can taint water supply pipes) – following quantitative assessment, design measures can be drawn up to mitigate such risks.

8.5.21 The overall risk rating for the Bexhill Connection section of the Scheme is considered to be medium. The site itself is not expected to be significantly

contaminated through its previous uses although made ground throughout the dismantled railway section may contain moderate levels of contamination. The surrounding land has been used for some small scale industrial activities which may have impacted the Scheme alignment as a result of contaminants migrating from activities which lie outside the boundaries of the Scheme.

8.5.22 The potential contamination sources which exist along the route are not considered to be unusual or complex. They are sources which are commonly found in urban and light industrial areas and contamination, if identified within the Scheme would be treated with mitigation measures or remediation techniques which are widely practised throughout the UK.

8.5.23 The overall risk rating for the rural section of the Scheme is considered to be low. The site is currently and has historically been open agricultural land. There are no known significant sources of contamination within the route alignment.

Potential sources of contamination have been identified for the site from an Envirocheck Report…. Two locations identified during the walkover survey (Table 8.2) as potential sources of contamination are not included on the potential sources of contamination figure…. Two operational licensed waste management and transfer stations (a metal recycling facility and a household, commercial and industrial transfer station) and one waste treatment and disposal site (of scrap metal and lead-acid batteries) are located within 250m of the site. These are not included within the potential sources of contamination figure…. No explanation is given for this decision. No historic sources are discussed. No Made Ground is discussed.

8.5.24 All potential sources of contamination identified from the historical land use review, site walkover and from the Envirocheck report are shown on Figure 8.1 of Appendix E.3 of this Addendum. There are no omissions on this Figure. The potential sources are summarised in Table 8.7 below.

Table 8.7: Potential Sources of Contamination

Location	Possible contaminants
Corporation Yard (Ch 150 – Ch 300)	Petroleum hydrocarbons, asphalt, tar, metals, asbestos, oils.
Egerton Stream (Ch 300 – Ch 690)	Oils, metals, fly tipped waste.
McNicholas Yard (Ch 690 – Ch 825) (Former Coal Yard)	Asphalt, tar, mineral oils, metals, fly tipped waste, residual coals.
Hav-a-Skip Yard (Ch 825 – Ch 950)	Fly tipped and other waste, asphalt, tar, mineral oils, metals, residual coals.

Location	Possible contaminants
(Former Coal Yard)	
1066 Motorcycle Training (Ch 975 – Ch 1125) (Former Coal Yard)	Fly tipped waste, asphalt, tar, mineral oils, metals, residual coals.
Dismantled railway (Ch 300 – 1500)	Metals, sulphates, asbestos, hydrocarbons, PCBs. Severe fly tipping has also occurred along several stretches of the dismantled railway.
Agricultural Land (Ch 1500 – Ch5100).	Occasional locations of fly tipping, possible red algae, buried carcasses, asbestos, fertilisers and pesticides.
Gas Valve Compound (Ch 5120)	Asbestos
Existing Railway (Ch 5290 – Ch 5310)	Metals, sulphates, asbestos, hydrocarbons, PCBs.
Glovers Farm (Ch1650)	Glovers Farm was reportedly used in the late 1800s for the tipping of farm waste, ash and glass bottles
Hillcroft Farm (Ch3500)	Hillcroft Farm has been used for various unlicensed waste disposal activities since the1960s
Upper Wilting Farm (Ch5500)	Upper Wilting Farm was license to accept inert waste but the licence lapsed in January 1979.
Sidley Waste Transfer depot (Ch 750)	Classed as a household, commercial and industrial transfer station
F.Davis & Co	A metal recycling facility located approximately 250m south of Ch 0.
Adams Farm (Ch 4000)	Registered waste treatment and disposal site which dealt with scrap metal and lead-acid batteries. The licence lapsed in 1978.

No contaminated land investigation has been undertaken…. No details of planned future investigation works are included within the chapter e.g. details of areas to be targeted, number of exploratory holes, if groundwater or gas monitoring will be undertaken etc.

8.5.25 A site investigation specifically to address the land contamination issues associated with the Scheme and to inform the Environmental Impact Assessment was not undertaken. The reasons for such a decision are as follows:

- Desktop information and qualitative risk assessment indicates that land within the vicinity of the Scheme is not significantly contaminated and the proposed future use (a hard surfaced road) is not considered to be sensitive. Potential sources of contamination are relatively localised and no potentially widespread sources of contamination have been identified.

- The potential contamination sources which exist along the route are not considered to be unusual or complex. They are sources which are commonly found in urban and light industrial areas and contamination, if identified within the Bexhill Hastings Scheme, could be treated with mitigation measures or remediation techniques which are widely practised throughout the UK.

- The cost of carrying out an investigation for the sole purpose of informing the ES would have been prohibitively expensive. Areas of the route where the majority of such an investigation would have been targeted (e.g. through the railway cutting) have particularly difficult access requirements and land ownership issues. It is considered that the overall findings of the ES would not have significantly differed if a site specific ground investigation had been undertaken specifically to inform the document.

8.5.26 A brief summary of the proposed geo-environmental investigation is provided below and Figure 8.2 and Figure 8.3 in Appendix E.3 illustrate the provisional locations of exploratory holes. These details are still subject to agreement with the Client and following the tender process for the Scheme there may be amendments made to the provisional scope of the investigation.

8.5.27 The current programme of works indicates that ground investigations are to take place between July and December 2008. The purpose of the ground investigation is to provide the following factual data for the prospective tenders: -

8.5.28 The nature and condition of the ground and groundwater along the proposed Bexhill to Hastings Scheme in order to allow geotechnical design of earthworks and structure foundations; understanding of the geotechnical risks to the scheme; and Information pertaining to any ground contamination.

8.5.29 The proposed investigation would comprise 91 Cable Tool boreholes, 25 of which are expected to be converted into rotary boreholes of up to 20m below ground level. The location of these exploratory holes is indicated on the Figures provided in Appendix E.3. In addition, 6 No. Cone Penetration Testings (CPTs) are proposed to investigate the nature of alluvial deposits, and 163 trial pits are proposed to 3 metres below ground level (mbgl), undertaken in order to investigate the nature of the shallow deposits.

8.5.30 Laboratory tests to determine the geotechnical and chemical characteristics of each strata will be undertaken on samples obtained during cable tool percussive drilling, coring, and trial pitting. Chemical analysis will be appropriate to the historic and current land uses.

8.5.31 Piezometers are required for future groundwater monitoring. 15 No. piezometers will be installed. The depths of piezometer installations will be determined on site subject to site specific conditions. Chemical analysis will be appropriate to the historic and current land uses.

The Geology and Soils section does not provide any details on consultations with the local authority or environment agency, either with respect to agreeing the methodology for the assessment, or in respect of Part IIa (of the Environmental protection Act, 1990) information and other records they may have.

8.5.32 Representatives from Mott MacDonald met with Steve Mills, the Contaminated Land Officer of Rother District Council on 4th July 2006 to discuss land contamination issues associated with the Scheme and the methodology presented in the Scoping and Methodology Report. In addition, the Contaminated Land Officer for Hastings Borough Council was consulted with regards to the Scheme.

8.5.33 The Contaminated Land officer for Rother District Council confirmed that there were no sites designated under Part IIa of the Environmental Protection Act within the District and that the process for the assessment of the Scheme should follow the methodology laid out in *CLR11: Model Procedures for the Assessment of Land Contamination.* Information was provided from the Council GIS database on potentially contaminated sites which was incorporated into relevant sections of the Soils and Geology Chapter of the ES.

8.5.34 The Contaminated Land Officer for Hastings Borough Council also confirmed that there were no sites designated under Part IIa of the Environmental Protection Act within the Borough. The Contaminated Land Officer noted that the Scheme does not have significant land take within the Borough of Hastings and in contamination terms the impacts were not likely to be significant.

Potential sources of contamination are discussed in various sections including hydrogeology and hydrology sections, but would be better discussed in a separate section.

8.5.35 Please refer to Table 8.7 above.

No contamination operational impacts were identified*.*

8.5.36 The operational impacts which may relate to land contamination (such as contaminated run-off and fuel spills from traffic accidents) are considered in Chapter 3 B: Construction Strategy and Chapter 9: Water Quality and Drainage of the ES.

8.6 IEMA review

The assessment of contamination on the site is the result of a walkover survey and some preliminary investigations. However, chemical analysis has not been undertaken to determine the significance of any contamination that may be present. A reasoned justification should be provided for not undertaking the investigations to enable the information to be considered within the ES.

The ES should clarify whether there is some uncertainty relating to the significance of the contaminated land effects.

These IEMA comments have also been raised as Regulation 19 issues. Please refer to sections 8.5.24 to 8.5.31 above.

8.7 Conclusions

8.7.1 In conclusion, given the context of the site and the proposed end use, the land contamination issues associated with the Scheme are unlikely to be significant. Potential sources of contamination are relatively localised and no potentially widespread sources of contamination have been identified.

8.7.2 If present, the likely contamination sources are not unusual or complex and remediation techniques which are widely practised throughout the UK would be used to treat contaminated land.

9 Water Quality and Drainage

9.1 Introduction

9.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 9 Water Quality and Drainage of the ES for the Scheme.

9.2 Regulation 19 issues - summary

9.2.1 The following section summarises the Regulation 19 issues raised by ESCC in their capacity as the Determining Authority following consultation on the ES. Five areas of the Flood Risk Assessment (FRA), produced by Faber Maunsell in April 2007, as part of Chapter 9 Water Quality and Drainage of the ES, require further consideration. These issues are listed below:

- Evidence that the sequential approach has been applied;
- Evidence that the Exception Test has been applied;
- Flood outlines, prior and post development (and calculations);
- Details of the proposed SUDs (and calculations); and,
- The residual risks of flooding.

9.2.2 A revised Flood Risk Assessment has been produced by Faber Maunsell in April 2008, and is submitted as a stand alone document alongside this Addendum to the ES.

9.3 IEMA Review – summary

9.3.1 The IEMA review identified a need for quantifiable explanations in the assessment of the magnitude of the predicted impact on flooding. The IEMA review emphasised the use of a range of return periods in the assessment of flooding.

9.4 Consultation

9.4.1 No formal consultation was undertaken for the purposes of this Addendum.

9.5 Regulation 19 Issues

Evidence that the sequential approach has been applied.

9.5.1 Section 5.1 of the FRA (Faber Maunsell, April 2008), details the application of the Sequential Test and the sequential approach. Section 5.1 Table 4 of the FRA covers the Environment Agency (EA) checklist for the demonstration of the application of the Sequential Test to planning applications. This table is recreated below and the answers to the appropriate questions for the BHLR planning application follow.

Table 9.1: EA Checklist for the demonstration of the application of the Sequential Test to planning applications

Question	Answer Yes/No	Sequential Test – passed or failed?
1. Is this application consistent in scale, development type and location, with a site allocation that has already been sequentially tested and included in the Local Development Document (LDD)?	If yes, state which allocation and the location in the development plan. **If the answer is 'No' go to Question 2.**	If the answer is 'Yes' the Sequential Test has been passed FINISH HERE
2. Does the application site fall within an area identified for 'windfall' development that has been agreed as part of the LDD in association with a Strategic Flood Risk Assessment (SFRA)?	If yes, state the location in the LDD. **If the answer is 'No' or there are no such areas identified in the LDD, go to Question 3.**	If the answer is 'Yes' the Sequential Test has been passed FINISH HERE
3. Does the LDD or background documents contain reasonably available, alternative site allocations that are situated in a lower flood risk zone?	If yes, state which allocation(s) and the location in the development plan. **If the answer is 'No' go to Question 4.**	If the answer is 'Yes' the Sequential Test has been passed FINISH HERE
4. Does the development plan or background documents contain reasonably available, alternative site allocations that are within the same Flood Zone and subject to a lower probability of flooding *from all sources* as detailed by the SFRA?	If yes, state which allocation(s) and the location in the development plan.	**If the answer is 'No' to Questions 3 and 4 the Sequential Test has been passed.** **If the answer is 'Yes' to Question 4, the Sequential Test has been failed** FINISH HERE

Table 9.2*:* Sequential Test answers in relation to BHLR:

Question number/ Answer	Qualifying statement
1/ No	The Local Development Frameworks for Rother District Council and Hastings Borough Council are currently being prepared. However, it is envisaged that this would be the only development of its kind in the area.
2/ No	This proposal has been identified as necessary by East Sussex County Council and a significant amount of time and effort has been put into selecting the best option. Additionally, the Strategic Flood Risk Assessments for Rother District Council and Hastings Borough Council are being prepared and therefore are not available for this process.
3/ No	Following a detailed analysis of various possible alignments, the preferred route was selected. Due to the number of watercourses in the area, it would not be feasible to produce a Scheme that does not fall within flood zone 3b (functional floodplain).
4/ No	The preferred route has been selected following a detailed analysis of a number of factors including flood risk.

9.5.2 In conclusion, the sequential test has been passed and therefore the exception test can now be applied.

Evidence that the Exception Test has been applied

9.5.3 Section 5.1 of the FRA details the application of the Exception Test. There are three rigorous conditions, all of which must be fulfilled before the Exception Test can be passed. These conditions are as follows:

- *A) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared. If the Local Development Document (LDD) has reached the 'submission' stage (see Figure 4.1 of PPS12: Local Development Frameworks) the benefits of the development should contribute to the Core Strategy's Sustainability Appraisal (SA));*

- *B) The development must be on developable (as defined in PPS3: Housing) previously-developed land or, if it is not on previously-developed land, that there are no reasonable alternative sites on developable previously-developed land; and*

- *C) A site-specific Flood Risk Assessment must demonstrate that the development will be safe, "without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".*

9.5.4 When considering part A) of the test, if a planning application fails to score favourably against the aims and objectives of the Sustainability Appraisal, the Local Planning Authority should consider whether the use of planning conditions and/or Section 106 Agreements of the Town and Country Planning Act, 1990, could make it do so. Where this is not possible the Exception Test has not been satisfied and planning permission should be refused.

9.5.5 In the absence of a Sustainability Appraisal, the developer/Local Planning Authority will have to provide a sound justification explaining in detail how the planning application provides wider sustainability benefits to the community that outweigh flood risk. Local Planning Authorities may consider the use of a sustainability checklist for this purpose.

9.5.6 Assistance on the consideration of part B) of the test can be found within Planning Policy Statement 3: Housing (OPDM 2006).

9.5.7 With regard to part C) it is the responsibility of the developer to propose a comprehensive flood risk management strategy for the site.

9.5.8 The answers to the three conditions of the Exception Test for the BHLR planning application are described below:

- It is deemed that the proposed Scheme would provide significant sustainability benefits to the wider community without having a noticeable detrimental effect in terms of flood risk thus satisfying part A) of the Exception Test.
- This aspect of the project is discussed in Chapter 8 of the Project Sustainability Appraisal Report, part of the ES. Further information indicating the need for the Scheme is provided in Chapter 2 Section 3 of the ES.
- Due to the nature of the project, there is no alternative previously developed land that could be used and the preferred alignment is deemed to provide the best alternative in terms of land use. Therefore, it is concluded that the proposed Scheme satisfies part B) of the Exception Test. For more information please refer to Chapter 3 of the 2007 Project Sustainability Appraisal Report.
- The FRA complies with the requirements set out in PPS25, and addresses the issues of safety and flood risk.

9.5.9 In conclusion, the Exception Test has been passed as all three conditions of the Test have been fulfilled.

Flood outlines, prior and post development (and calculations).

9.5.10 Figures 8 and 10 of the FRA show flood outlines for the design event (100yr + 20%) for existing and post-road construction scenarios respectively. Figures 8 and 10 of the FRA are included here in Appendix F.

Details of the proposed SUDs (and calculations).

9.5.11 Details of the proposed SUDS are included in Section 4.2 of the FRA. In May 2006, Owen Williams Consultants carried out a Preliminary Drainage Design as part of the BHLR scheme. A brief summary of the different SUDS techniques to be employed in the Scheme is presented below, whilst a more detailed description is given in Chapter 9 Section 5 of the ES.

9.5.12 *Grass Swales*. The term swale refers to a series of vegetated, open channels that are designed specifically to treat and attenuate storm water runoff for a specified water quality volume. As storm water runoff flows through the channels, it is filtered by the vegetation in the channel and thus treated; filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales are well-suited to treat highway runoff because of their linear nature, and are often installed as part of a drainage network connecting to a pond or wetland, prior to discharge to a natural watercourse.

9.5.13 *Retention Ponds*. Ponds can be designed to accommodate considerable variations in water levels during storms, thereby enhancing flood-storage capacity. These would create habitats attractive to wildlife and thus enhance the environmental and visual amenity value of the Scheme. Ponds can be fed by swales which would also be adopted for the development.

9.5.14 *Petrol Interceptors*. Although not a type of SUDS, petrol interceptors are nonetheless to be incorporated into the proposed drainage system. A petrol interceptor is a trap installed on a surface water drainage system used to filter out hydrocarbon pollutants from rainwater runoff. It is typically used in road construction to prevent fuel contamination of streams carrying away the runoff.

9.5.15 For more information on the SUDS to be deployed as part of the BHLR Scheme refer to Appendix E of the FRA, the 2007 Design and Access Statement produced by ESCC and the 2008 Addendum to the Design and Access Statement produced by ESCC.

The residual risks of flooding

9.5.16 Section 5.3 of the FRA details the residual risk of flooding for the Scheme. Residual risk is defined as the risk which remains after all risk avoidance, reduction and mitigation measures have been implemented. A brief assessment of the residual risk of flooding at the site is given in the following paragraphs:

9.5.17 *Flood Risk from Tidal Breach*. The residual flood risk from this source is deemed to be low. The lowest elevation of the new road would be 5.75mAOD. This elevation is higher than the currently predicted 1000 year return period sea level. It also exceeds the 20 year return period sea level in 2070, taking predicted climate change into account (please refer to Table 9.2 below):

Table 9.3: Predicted Sea Levels for Hastings (mAOD)

Return	2007	2060	2070	2115
20 years	5.2	5.6	5.7	6.4
200 years	5.4	5.8	5.9	6.6
1000 years	5.6	6.0	6.1	6.8

9.5.18 Whilst the maximum predicted water levels with sea level rise for higher return periods are higher than the lowest level of the road, the location of the road is well inland and brief periods of tidal breach are not expected to place the BHLR at flood risk.

9.5.19 *Flood Risk from Overtopping*. Whilst overtopping is a problem in the Bulverhythe area (that would worsen with sea level rise), the route of the BHLR is sufficiently far inland that the flood risk to the BHLR from overtopping is deemed to be low.

9.5.20 *Flood Risk from the Extreme Fluvial Flood (1 in 1000 years)*. The modelled water levels for the extreme flood event are shown in Appendix D of the FRA. The average water level during the extreme flood at the various locations where the road crosses the floodplain is 3.87mAOD. The water levels for the extreme flood event are thus significantly lower than the lowest level of the BHLR (5.75mAOD). The residual flood risk from the extreme flood is therefore deemed to be low.

9.6 IEMA Review

Quantifiable explanations in the assessment of the magnitude of the predicted impact on flooding could have been provided, represented by a range of return periods for flooding.

9.6.1 *Various return periods for assessment of flooding:* Four different return periods were revisited for the existing scenario: 20 yr; 100 yr; 100 yr +20% and 1000 yr. In addition the 100yr + 20% with-road condition was investigated. The revisions of these different return periods is summarised below.

9.6.2 *20 yr return period:* There are no properties affected by flooding within the main Combe Haven floodplain. Upstream of Crowhurst Culvert and the Post Office's culvert, a number of properties (approximately 12) are affected by flooding of the Powdermill Stream. The culverts through Crowhurst have a maximum capacity to

cope with events of between 5 and 10 yr return period. Downstream of Combe Haven, approximately 150 properties in the urbanised area of Bulverhythe are likely to be affected by flooding with a 20 yr return period, due to tidal locking.

9.6.3 *100 yr return period*: There is only a minor increase in the area of floodplain associated with a 100 yr return period against flooding with a 20 yr return period. The number of additional properties likely to be at risk of flooding is approximately 15 in the Bulverhythe area.

9.6.4 *100 yr + 20% return period existing*: There is negligible additional impact of the 100 yr + 20% return period existing condition over the 100 yr return period. Whilst the extent of the floodplain covers a wider area than the lesser return periods, this is mainly in rural areas. No new properties in the Crowhurst or Bulverhythe areas are deemed to be at flood risk.

9.6.5 *100 yr + 20% return period with-road:* There is no appreciable difference between the 100 yr + 20% return period existing and the 100 yr + 20% return period with-road conditions, when mitigating measures such as clear span bridges and large culverts are incorporated. The impacts of the scenarios can therefore be considered to be virtually identical.

9.6.6 *1000 yr return period:* There is significant additional impact of flooding with a 1000 yr return period against the lesser return periods; especially in the Bulverhythe area where approximately 300 additional properties are expected to be at risk of flooding for the greater return period.

9.6.7 Following revision of the various return periods it is concluded that the impacts of the design condition (100yr + 20%) are virtually identical to those observed for the 20 yr, and 100 yr return periods. The impacts of the extreme flood (1000 yr return period) however, are significantly greater.

9.6.8 In summary, the design condition can be considered representative of the impacts of flooding with lower but not higher return periods. The Assessment is therefore considered appropriate for all return periods up to the design (100 yr +20%) event.

9.7 Conclusions

9.7.1 The aim of this Chapter 9 of the Addendum to the ES is to address the Regulation 19 issues and IEMA review comments that have been raised as part of a review of the ES.

9.7.2 It is considered that this chapter has demonstrated evidence that the sequential approach has been applied and that the Exception Test has been passed. Section 5.1 of the FRA details the application of the Sequential Test, the sequential approach and the Exception Test, whilst Section 5.1 Table 4 of the FRA covers the

EA checklist for the demonstration of the application of the Sequential Test to planning applications.

9.7.3 Figures from the FRA and re-presented here in Appendix F.1 show flood outlines for the design event (100yr + 20%) for existing and post-road construction scenarios respectively.

9.7.4 Details of the proposed SUDS are included in Section 4.2 of the FRA. The three drainage techniques to be deployed as part of the Scheme are: are grass swales, retention ponds, and petrol interceptors.

9.7.5 The residual risks of flooding from tidal breach, overtopping, and the extreme fluvial flood (1 in 1000 yr) sources are all shown to be deemed as low. In addition, four different return periods for flooding were inspected for the existing scenario: 20 yr; 100 yr; 100 yr +20% and 1000 yr. The 100yr + 20% with-road condition was also investigated. Following inspection of the various return periods it is concluded that the impacts of the design condition (100yr + 20%) are virtually identical to those observed for the 20 yr, and 100 yr return periods. The impacts of the extreme flood however, are significantly greater. In summary, the design condition can be considered representative of the impacts of flooding with lower but not higher return periods. The Assessment is therefore considered appropriate for all return periods up to the design (100 yr +20%) event.

10 Air Quality

10.1 Introduction

10.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 10 Air Quality of the ES for the Scheme.

10.1.2 In addition to the Regulation 19 issues and IEMA review comments made specifically in relation to Air Quality, issues relating to Air Quality impacts on Designated Sites for Nature Conservation are discussed in Chapter 12 Nature Conservation of this Addendum to the ES. Please refer to Appendix G for all supporting information.

10.2 Regulation 19 Issues - summary

10.2.1 Responses received under Regulation 19 included a request that mitigation measures be included within the air quality assessment.

10.3 IEMA Review - summary

10.3.1 Responses received from IEMA relating to the air quality chapter are reproduced below.

10.4 Consultation

10.4.1 No consultation was carried out during the production of this part of the Addendum as the requirements of the Regulation 19 response and IEMA comments were considered to be clear and mitigation measures provided are in accordance with best practice.

10.5 Regulation 19 Issues

A mitigation section is missing from the air quality chapter of the ES, and should be included. The assessment identifies two areas of adverse impact where there is a need to consider and develop appropriate mitigation measures. The conclusions section (10.4) makes reference to the need for mitigation but goes no further. Schedule 4 of the EIA Regulations require the ES to include a description of the measures to prevent, reduce & where possible offset any significant adverse effects on the environment. Mitigation of air quality impacts during both construction and operational stages should be discussed.

Construction Phase Mitigation Measures

10.5.1 The ES chapter identified a number of human health and ecological receptors which are potentially sensitive to dust emissions and recommended that mitigation measures be stringently applied to avoid the risk of nuisance effects at Belle Hill.

10.5.2 The mitigation measures provided below are consistent with current best practice for construction sites and are suitable for incorporation into a Construction Environmental Management Plan (CEMP). Please refer to section 3B.12 of the ES.

10.5.3 Specific mitigation measures in relation to greenhouse gas emissions have not been identified as the effects of greenhouse gas emissions associated with the BHLR were concluded to be of negligible significance. However, if applied, the measures outlined below would also help to reduce greenhouse gas emissions (primarily carbon dioxide (CO_2)).

10.5.4 In order to reduce the risk of significant dust emissions during the construction phase the following measures laid out in Table 10.1 below are recommended where practicable.

Operation Phase Mitigation Measures

10.5.5 Once the Scheme is in operation, changes in air quality are predicted to vary along the route, but overall these are expected to be slightly beneficial (please refer to section 10.4.28 to 10.4.46 of the ES). Therefore no mitigation measures are required during the operational phase of the Scheme.

10.6 IEMA Review

Section 10.2.62 states that 'the contribution of the Scheme to tackling climate change has been assessed in the context of a 15% increase or reduction in net CO_2 emissions …. The ES should clarify what is meant by this statement as it is unclear how a 15% increase in net CO_2 emissions can be classed as a contribution to tackling climate change.

10.6.1 The ES stated that *"the contribution of the Scheme to tackling climate change has been assessed in the context of a 15% increase or reduction in net CO_2 emissions … from the Scheme, compared to the Do-Minimum option"* (Paragraph 10.2.58). This should be amended so that "a 15% increase or reduction" becomes "a 15% reduction". This is in reference to the emissions targets set by the Government at the time.

Table 10.1: Measures to reduce the risk of significant dust emissions during the construction phase

1	Maintain all dust control equipment in good condition and record maintenance activities.
2	Do not allow dry sweeping of large areas.
3	Provide and ensure the use of wheel-wash facilities near the site exit wherever there is a potential for carrying significant quantities of dust or mud off the site.
4	Impose and signpost maximum speed limits of 5 miles per hour (mph) on un-surfaced haul routes and work areas and 10 mph on surfaced haul routes and work areas.
5	Minimise the amount of excavated material held on site and sheet all materials wherever possible to prevent liberation of dust.
6	Avoid double handling of material.
7	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
8	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction.
9	Carry out site inspections regularly to monitor compliance with dust control procedures set out above and record the results of the inspections, including nil returns, in a log book.
10	Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
11	Record any exceptional incidents causing dust episodes on or off the site, and the action taken to resolve the situation, in a log book.
12	Plan construction activities in order to reduce the number of plant, and to maximise the use of plant while at the site.
13	Do not leave construction plant idling when not in use.
14	Locate site plant away from sensitive receptors.
15	Use mains electricity or battery power where possible (or practical for hand tools) rather than diesel.
16	Purchase electricity generated from renewable sources.
17	Avoid the use of diesel or petrol powered generators.
18	Plan routes that vehicles make to the facility in order to make them as efficient as possible.
19	Ensure that vehicles used should be at their maximum capacity in terms of load, to minimise the number of vehicles and journeys to and from the site.
20	Use non-road methods of material delivery or, for long-distance haulage, partial non-road delivery, for example using trains or barge.

Significance criteria for greenhouse gas emissions are provided in Table 10-A.9 (Appendix 10-A, p 10-A-16). These are based on changes from existing levels. Whilst this is the conventional approach to the assessment of any environmental effect, given that the UK stated policy on greenhouse gas emissions is a 60% reduction by 2050 with significant progress (26-32%) by 2020 one could argue that any increase should be considered to be of high negative significance as it is moving in the opposite direction to policy requirements.

10.6.2 The issue of reducing greenhouse gas emissions across all sectors is difficult and challenging. A number of sectors can be targeted and emission reduction plans be put in to place. However, behavioural change also plays a significant role in reducing emissions.

10.6.3 Transport emissions are currently increasing. The report on 2006 greenhouse gas emissions by Defra showed that emissions from the transport sector as a whole increased by 1.3% between 2005 and 2006 (News release, January 2008) and emissions from road transport have increased by 10% since 1990 (Energy and the Environment, January 2008). Although technological improvements in vehicle fuel combustion have reduced emissions, and the small-scale introduction of biofuels in place of traditional fuels have had some impact on reducing emissions (based on the gCO_2/km metric) the increase in car use overall means that the total emissions from road vehicles have increased. Given that travel by personal car is set to increase in the foreseeable future, improvements in technology are one of the key ways in which (nationally) greenhouse gas emissions from the transport sector as a whole are anticipated to decrease.

10.6.4 The assessment concluded that there would be an increase in CO_2 emissions of approximately 5.7% over the ten year study period. As this is the cumulative change over this period, the actual change is in the order of around 0.6% increase per annum. This is less than the projected increase in emissions nationwide over the same period, and therefore does not significantly worsen the problem of emissions of greenhouse gases. Although this is still an increase in emissions compared to the baseline case, the assessment concluded that this was a reduction relative to the national projections and therefore would have a negligible effect on overall greenhouse gas emissions.

Table 10.3 provides categories for sensitivity and magnitude of impact and demonstrates how these interact to result in a given significance level. Whilst the factors that are considered in determining magnitude and sensitivity are identified, the categories used are not defined making it difficult to see how and why impacts are attributed a given level of magnitude or sensitivity.

And

Table 10-A.4. The basis for the percentage changes as assigned to each level of significance should be described to enable the reader to understand why, for example, a 1.4% reduction in PM_{10} is significant.

10.6.5 Table 10.3 in the ES provides a general matrix for how the various interactions between magnitude and sensitivity define the overall significance of effects. Within Appendix 10A of the ES, the categories for determining the magnitude and significance for each of the assessment criteria (local air quality, construction dust, greenhouse gas emissions etc.) are described.

10.6.6 A number of approaches can be used to determine whether the potential air quality effects of a development are significant. However, there remains no universally recognised definition of what constitutes 'significance'. Guidance is available from a range of regulatory authorities and advisory bodies on how best to determine and present the significance of effects within an air quality assessment. It is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively.

10.6.7 Presentation of numerical effects allows comparison with relevant UK air quality objectives and limit values. Within this assessment, the following information is presented for each receptor where pollutant concentrations have been determined:

- Absolute pollutant concentrations without the proposed development;
- Absolute pollutant concentrations with the proposed development; and,
- Change in concentrations between the above.

10.6.8 Any description of an impact of a development is informed by numerical results. The magnitude of the change identified must also be considered in the context of existing air quality conditions within the study area in order for the significance of that magnitude to be determined. However, an element of professional judgement must also be involved and boundaries between different descriptors of magnitude must be defined.

10.6.9 Boundaries have been defined within this assessment (for operational air quality impacts), based on changes to the overall concentration of a given pollutant in the context of the objective level and/or existing conditions. For example, for NO_2, the significance criteria is based on the change in concentrations in the context of the objective level. A change of 4 $\mu g/m^3$ from the annual mean represents a 'high' magnitude if it brings the total concentration above or below the objective level and a 'medium' magnitude if it does not. A change of between 2 and 4 $\mu g/m^3$ of the annual mean represents 'low' magnitude, and a change of less than 2 $\mu g/m^3$ represents 'negligible magnitude, provided neither bring the total concentration above or below the objective level. All receptors assessed for the operational phase are considered to be of 'high' sensitivity. Therefore, 'high', 'medium', 'low' and 'negligible' magnitude changes in NO_2 concentrations are concluded to be of 'critical', 'substantial', 'moderate' and 'negligible significance' respectively.

The ES could have identified whether any mitigation for construction dust will be necessary during prolonged dry spells.

10.6.10 Appropriate mitigations are discussed in section 10.5 above.

10.7 Conclusions

10.7.1 Mitigation measures have been provided to address potential air quality effects from the construction stage of the Scheme. During the operation stage, changes in air quality are predicted to vary along the route, but overall these are expected to be slightly beneficial, and therefore no mitigation measures are required. The measures provided at the construction stage are suitable for incorporation into a CEMP.

10.7.2 Specific issues raised by the IEMA review have been addressed, with reference to the ES and additional information. With regards to Greenhouse Gas Emissions, the assessment in the ES concluded that there would be an increase in CO_2 emissions of approximately 5.7% over the ten year study period. This is a cumulative change, so that the actual change over this period is approximately 0.6% increase per annum. The increase here is less than the projected nationwide increase in emissions over the same period. Although this is still an increase compared to the baseline case, the assessment concluded that this was a reduction relative to the national projections and therefore would have a negligible effect on overall greenhouse gas emissions.

11 Noise and Vibration

11.1 Introduction

11.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 11 Noise and Vibration of the ES for the Scheme.

11.1.2 No Regulation 19 issues have been put forward following the Determining Authority's review and relating to the Noise and Vibration chapter of the ES. Therefore, no discussion will follow in this chapter under the Regulation 1 issues heading.

11.2 IEMA Review - summary

11.2.1 The issues raised in the IEMA Review were:

Information describing whether the Local Authority was consulted on the selection of the representative properties and their thoughts would be helpful.

Section 11.2.88 (p 11-16) indicates the Council's that have been consulted on the method used for the assessment of the impact of construction noise. A record of the comments or opinions of these authorities would be helpful to demonstrate that the assessment is in compliance with their requirements.

An assessment of night time noise impacts has not been undertaken. However, given that there is some prospect of night time construction work this assessment should be included in the ES.

The ES states that no significant night time noise impacts have been identified, but this should be placed in the context of no night time noise assessment being undertaken.

11.3 Consultation

11.3.1 No formal consultation was undertaken for the purposes of this Addendum to the ES.

11.4 IEMA Review

Information describing whether the local authority was consulted on the selection of the representative properties and their thoughts would be helpful.

And

Section 11.2.88 (p 11-16) indicates the Councils that have been consulted on the method used for the assessment of the impact of construction noise. A record of the comments or opinions of these authorities would be helpful to demonstrate that the assessment is in compliance with their requirements.

11.4.1 Choice of Representative Properties: The relevant Local Authorities were not consulted on the choice of representative locations as this was a specific technical issue where choice of receivers was made on acoustic principles based on expertise and experience. Ultimately all properties within the assessment zone, 300 metres either side of the centreline of the proposed new road, were assessed, in accordance with DMRB Guidance Volume 11, Section 3, Part 7 Traffic Noise and Vibration.

11.4.2 Assessment of Construction Noise: An Environmental Health Officer Mr D. Bell representing Hastings Borough Council was consulted in the morning of 19th February 2007 on the assessment of construction noise. He held the view that evening and night-time working should be avoided as far as possible and that working hours should be restricted to between 07:00 and 19:00 hrs on weekdays, 08:00 and 13:00 hrs on Saturdays and no work should take place on Sundays or bank holidays. The 75 dB $L_{Aeq,12\ hour}$ criteria was accepted but it should be acknowledged that this was a high noise level. The use of BS 5228 as a construction noise assessment methodology was accepted.

11.4.3 An Environmental Health Officer, Mrs. Barbera, representing Rother District Council was also consulted in the afternoon of 19th February 2007, and expressed similar views.

An assessment of night time noise impacts has not been undertaken. However, given that there is some prospect of night time construction work this assessment should be included in the ES.

And

The ES states that no significant night time noise impacts have been identified, but this should be placed in the context of no night time noise assessment being undertaken.

11.4.4 Following the IEMA Review comments on the assessment of construction noise for night-time working, additional work has been carried out in an attempt to evaluate the potential effects of construction works which may be necessarily undertaken during the evening or night.

11.4.5 The design team was consulted about the likely night-time working program but were unable at this stage to provide any guidance on plant use and activity scenarios or on the precise timing and duration of the activities which would be likely to take place outside of normal working hours.

11.4.6 Assumptions have therefore been made, based on the information provided in ES Chapter 3B – Construction Strategy.

11.4.7 The assumptions are that only activities which must by their nature be undertaken during the night-time would occur. These would be works which must be carried out under railway possession, works where traffic management changes need to be carried out under diversions or layout changes or where construction activities would otherwise interfere with traffic movements. It has also been assumed that no other activities, other than essential works, would be undertaken during the night-time hours.

11.4.8 The sites of night-time construction activity are:

- Ninfield Road bridge;
- Railway bridge;
- Belle Hill junction;
- Queensway junction; and,
- Crowhurst Road junctions.

11.4.9 Construction noise criteria used for the assessment of potential impacts are presented in Table 11.1 below.

Table 11.1: Construction Noise Criteria – Residential

Time of Day	Construction Noise Level	
	Within 150m of existing road	Over 150m from existing road
Daytime (07:00-19:00 hrs)	75 dB $L_{Aeq,12\ hr}$	70 dB $L_{Aeq,12\ hr}$
Evening (19:00-22:00 hrs)	65 dB $L_{Aeq,1\ hr}$	60 dB $L_{Aeq,1\ hr}$
Night-time (22:00 – 07:00 hrs)	Either 55 dB $L_{Aeq,\ 1\ hr}$ or Ambient $L_{Aeq,\ 9hr}$ + 5 dB: The lower level applies	

11.4.10 For this assessment where the ambient level plus 5 is greater than 55 dB $L_{Aeq,1hr}$, 55 dB(A) has been applied as the criterion level.

11.4.11 For night-time construction noise, effects would be considered to be significant where the predicted ambient noise level during construction exceeds either 55 dB $L_{Aeq,1hr}$ or the night-time ambient noise level prior to construction by at least 5 dB whichever is the lower limit. The criterion for a significant construction noise effect has been taken to be where this level is likely to occur over a period of at least one month.

Night-time Construction Activities:

Ninfield Road Bridge

11.4.12 Bailey bridge constructions including access works and ramps. The activities requiring night-time working are expected to be limited to the major traffic management switches and the installation and removal of the Bailey bridges.

Railway Bridge

11.4.13 Lifting and placing concrete beams, fixing in position, erection of safety equipment and scaffolding. The works envisaged are limited to the installation of precast, prestressed concrete beams and associated safety measures.

Belle Hill, Queensway and Crowhurst Road Junctions

11.4.14 Tie-in works, including surfacing, moving barriers and temporary signs and diverting traffic.

11.4.15 Activities envisaged for these works are assumed to be limited to minor surfacing work and the repositioning of traffic signs, road markings and traffic management apparatus.

Assessment:

11.4.16 In all cases the assessment is based on the worst case plant activity combination envisaged and the assumption that the result represents the worst likely hourly noise level. The assessment uses the same representative receiver locations as used in the ES daytime construction noise assessment and has been limited to a radius of 300 metres around each centre of activity.

11.4.17 The plant and activity assumptions are detailed in Table 11.2 and the results of the noise level calculations are presented in Table 11.3 of Appendix H.1 to this Addendum to the ES. Figures 11.1 to 11.3 in Appendix H.2 present source and receiver locations.

11.4.18 Plant and activity scenarios (Table 11.2) have been assumed based on an assessment of the plant items and types which might be used in each activity and

the likely percentage of the time during each activity when the plant would be expected to be operating at its maximum operational noise level.

11.4.19 All construction activities have been defined at the centre of specified working areas to provide average working distances between each receiver and the likely construction activity locations allowing for the typically variable nature of some activities.

11.4.20 Worst-case activity $L_{Aeq,T}$ noise levels have been estimated using the guidance provided in *British Standard BS 5228: 1997: Part 1 and the Update Of Noise Database For Prediction Of Noise On Construction And Open Sites* (Defra, 2005).

11.4.21 At this stage of the Scheme development, the information provided in BS 5228 and the Defra document constitute the best available information for the purpose of this assessment. It is envisaged that following the development of a more detailed construction programme by the contractor and the availability of equipment and plant manufacturers noise data, overall predicted noise levels at receptors would be lower than presented in this study.

11.4.22 The resultant noise level in each programme period for each receptor has been calculated using the noise calculation software module SiteNoise, which is part of the software suite NoiseMap 2000, which adopts the calculation procedures detailed in BS 5228: 1997. Where appropriate the screening effects of buildings and other features have been included in the prediction model. According to BS 5228, if partial line of sight exists between a receptor and source a 5 dB correction is made to the calculated noise level and if no line of sight exists a 10 dB correction can be applied.

11.4.23 Calculated noise levels for the construction activity scenarios (Table 11.2 of Appendix H.1), are presented in terms of worst-case night-time noise levels.

11.4.24 For Residential Construction Noise Effects – Night-time (23:00 – 07:00 hrs) - Table 11.3 details the receptors at which construction noise levels have been calculated, the number of residential properties each receptor represents and the assessed worst case construction activity noise level which has been calculated to arise at the receptor. The construction noise levels are listed by location.

11.4.25 Table 11.3 also details the ambient noise level for each receptor, based on the baseline noise survey data. Ambient noise levels are taken from direct measurements from the long term measurement locations where appropriate, or by extrapolation and interpolation using comparison of the nearest short term measurement location with the night time data from an associated long term site. The criteria applied are given in Table 11.1 above.

Mitigation Options

11.4.26 Conventional options for the control and mitigation of construction noise impacts include: careful selection of plant, effective site management; engineering control;

acoustic screening; restricted hours of working; and liaison with the local community. Options for engineering noise control include the adoption of appropriate construction processes and techniques, and these would be considered in further detail prior to the start of construction.

11.4.27 Compliance by any contractor with the general recommendations of BS 5228: Parts 1 and 2 is also considered to represent good practice and would be adopted wherever practicable. These include:

vehicles and equipment fitted with effective exhaust silencers, maintained in good working order and operated to minimise noise emissions in accordance with BS 5228;

compressors fitted with properly lined and sealed acoustic enclosures where environmental noise disturbance may arise and these should be kept closed whenever the machines are in use;

pneumatic percussive tools fitted with mufflers or silencers in accordance with the manufacturer's recommendations;

machines in intermittent use shut down in the intervening periods between work or throttled down to a minimum (including HGVs waiting to access the site on the highway);

where practicable, rotary drills and bursters actuated by hydraulic or electrical power should be used for excavating hard material;

care taken when loading/unloading vehicles, dismantling scaffolding or moving materials to reduce impact noise;

noise reduction by the use of temporary barriers, screens, acoustic sheds and enclosures provided where reasonably practicable and when located close to residential dwellings in accordance with the principles of BS 5228;

where practical, all plant to conform to the noise limits presented in the EC Noise Emission in the Environment by Equipment for use Outdoors, Directive 2000/14/EC;

noise monitoring undertaken by the Contractor to ensure compliance with any Local Authority construction noise conditions or undertakings made by the Contractor itself;

where practicable the prefabrication of large units undertaken off-site;

where practicable and subject to ground conditions, piling techniques that minimise noise and vibration adopted instead of percussive techniques; and,

the contractor to employ 'Best Practicable Means' (CoPA 1974), at all times and at all locations during the construction phase to minimise construction noise and vibration.

11.4.28 The outline Construction Environmental Management Plan (CEMP) would incorporate a construction code of practice and make provision for guidance on the control and management of construction environmental impacts. The principles of good practice summarised above and the use of all other reasonably practicable means for the control of noise and vibration would be incorporated into the CEMP.

11.4.29 A high standard of community communications and the provision of up-to-date relevant information to affected households will often serve to reduce the level of

complaints. In extreme cases of night-time construction noise, consideration may be given to temporary relocation of people who are likely to be most severely affected.

11.5 Conclusions

11.5.1 A worst case assessment suggests that a total of 578 residential properties are potentially affected by construction noise levels at night above the adopted criteria. However, the duration of the night-time activities generating the noise levels predicted is in most cases likely to be limited, in many cases to a single weekend and possibly a single night.

11.5.2 The assumed construction method at this stage of the assessment provides a worst-case scenario with the assumption that concurrent activities would occur over a particular hour in the same location. It is considered unlikely in practice that these impacts would give rise to significant effects.

11.5.3 In reality the predicted hourly noise levels are likely to represent a worst case scenario. The prediction methodology adopted for this study is also recognised to over predict construction noise levels, particularly when the noise source term data from BS 5228 are adopted. Furthermore, the latest EC Directive relating to noise emissions from outdoor equipment, which includes construction and demolition plant and equipment, has imposed more stringent noise emission limits on such plant.

12 Nature Conservation and Biodiversity

12.1 Introduction

12.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 12 Nature Conservation of the ES for the Scheme.

12.2 Regulation 19 Issues - summary

12.2.1 The full Regulation 19 issues raised by NE, Sussex Wildlife Trust (SWT), EA and ESCC as the Planning Authority following consultation on the ES in relation to Nature Conservation and Biodiversity are contained in Appendix A of this Addendum to the ES. They are summarised below. In a number of instances the comments received have been amalgamated and abbreviated. Each comment has been allocated a number (in brackets), so that the paragraphs within this Chapter that relate to specific and amalgamated Regulation 19 issues can be cross referenced to the summaries below:

- A list of all species recorded during the surveys is to be provided (1);
- the species list to include information supplied by third parties where possible (2);
- the ES includes contradictions with regard to the distance between the proposed road route and the Marline Wood Site of Special Scientific Interest (SSSI) and the Combe Haven SSSI (3);
- the function of woodland contiguous with the SSSI should be considered (4);
- the mitigation strategy failed to consider the ecological functioning of the Combe Haven Valley as a whole and the damage that fragmentation and disturbance result in. There was no consideration given to connectivity of habitats such as hedgerows and watercourses (5);
- the effects on bats are not adequately addressed (6);
- the mitigation for the ecological impacts is inadequate and additional consideration to its feasibility needs to be given (7);

- mitigation for the proposed severance of the Combe Haven Valley from the Combe Haven SSSI needs to be considered. Additional mitigation needs to be provided and habitat mitigation needs to be on a two for one basis (8);

- the extent of mitigation and the likely effectiveness of proposed habitat re-creation is unknown (9).

- the short-medium term impacts while mitigation matures should be considered (10);

- the proposals fail to address the requirements of PPS9 and other planning policy, in particular, the applicant needs to show to what extent the provision for ecological enhancements go above and beyond mitigation (11);

- there has been no consideration of potential impacts of discharge from road drainage, leachates from construction and alteration of air quality and the chemical environment on downstream habitats. In particular there has been no assessment in this respect on Marline Wood SSSI and Combe Haven SSSI (12);

- drains have been included as mitigation for runoff but clarification is needed on how this has been considered with regard to storm/flood events (13);

- no consideration has been given to the impact on birds, fish and mammals as a result of runoff and pollution in Table 9.16 of the ES (14);

- there is no consideration to the impacts of Nitrogen deposition on the Combe Haven SSSI or Marline Wood SSSI (15);

- no consideration has been given to the impact of salt spray on Marline Wood SSSI(16);

- the ES is deficient in addressing mitigation for indirect impacts on the Marline Woods SSSI and the Combe Haven SSSI (17);

- the mitigation strategy fails to address the impact of severance on ecologically important or BAP habitats and species, in particular, watercourse crossings are inadequate for the size of the Scheme (18);

- the impact of noise disturbance on bird populations needs to be considered in greater detail (19);

- the effect of light disturbance on bats have not been adequately addressed (20);

- the dormouse assessment is unclear and contradictory (21);

- great-crested newt and reptile surveys were not carried out to NE guidance to confirm population size. The location of reptile receptor sites needs clarification (22);

- the impact of light disturbance, and severance of foraging and commuting routes on bats should be considered. Additional bat survey work is required to inform mitigation (23);

- accurate ornithological surveys of Combe Haven SSSI are required to produce reliable mitigation (24);

- more detail is required on management and monitoring of habitats particularly in respect of mitigation and compensation habitats (25); and,

- a detailed survey of the Marline Woods SSSI is required to assess the impacts of shading (26).

12.3 IEMA review - summary

12.3.1 The ES review by IEMA raised the following issues:

- an indication of the purpose and method of consultation with bodies listed is required;

- the use of the term significance is confusing;

- the basis for assessing Red Data Book bird species as of local value needs clarification;

- the location and current nature conservation value of the areas to be used as replacement habitat are to be identified;

- a clearer commitment to the provision of bat roosts in mitigation for habitats is to be provided; and,

- a greater commitment to the implementation of habitat management needs to be provided. This is to include management programme and safeguards against withdrawal of resources.

12.4 Consultation

12.4.1 Consultation with NE and the EA has been undertaken to determine the strategy for addressing the Regulation 19 issues and IEMA comments arising from each respective review of the ES. The adopted strategy has been agreed during meetings held at ESCC offices with ESCC as the Determining Authority, NE and EA on 26th November 2007 and 10th March 2008. Please refer to Appendix B for minutes of these meetings. In addition, further consultation with NE and the EA has been undertaken following their review of the draft Addendum to the ES. A Schedule of Additional Comments raised by both NE and the EA is included in Appendix A.5. Records of these supplementary meetings held at NE offices in Lewes and ESCC offices on 22nd July 2008 are included in Appendix B.1 of this Addendum to the ES.

12.5 Regulation 19 issues

A complete list of species encountered during all the ecological surveys, of the preferred route and the proposed mitigation/ compensation areas, carried out in connection with the application should be provided. A complete list of species identified and supplied by third parties…. should be provided. (Summary points 1 and 2).

12.5.1 At a meeting with the County Ecologist Dr. Alex Tait held at County Hall on 26th November 2007 (please refer to Appendix B) it was agreed that this species list should concentrate on including Biodiversity Action Plan (BAP) species and protected species. A list of all UK BAP and protected species recorded at the site during the surveys is provided in Appendix I.1.

12.5.2 The brief for the field surveys was to survey for protected species. As a result a list of all species seen or heard was not maintained and records retained only relate to the target species. A list of all Red Data Book (RDB) and Nationally Notable invertebrate species is included at Appendix 12-1 of the ES.

There are contradictions with regard to the distance of Marline Woods SSSI from the road. This needs reviewing. See specifically Table 12.4 and maps in the Design and Access Statement. The same issue arises for Combe Haven SSSI. Confirm that land from the SSSI's will not be lost as a result of the scheme (Summary point 3);

And,

The application is deficient in terms of addressing the mitigation of actual and potential indirect impacts on the SSSIs (Summary point 17).

12.5.3 Table 12.4 of Chapter 12 of the ES provides information on designated sites within 2km of the Scheme. Table 12.4 includes information on the site names, site area, Ordnance Survey grid references and reasons for designation. In addition, Table

12.4 provides the minimum distance from the centreline of the Scheme. Combe Haven SSSI is stated as being 0km from the centreline of the Scheme while Marline Woods SSSI is stated as being 0.05km from the centreline of the Scheme.

Combe Haven SSSI

12.5.4 At its closest point Combe Haven SSSI would be located immediately adjacent to The Greenway. This point is located at grid reference TQ 763 106 where The Greenway would pass over a corner of the southern end of the disused Crowhurst, Sidley and Bexhill Branch Railway to the east of Adam's Farm. There would be no works carried out within the SSSI at this point. At this location the centreline of the Scheme carriageway would be located approximately 50m to the north of the SSSI but would be approximately 7.5m lower than the level of the SSSI. The habitat within this area is dominated by species poor secondary sycamore and ash woodland with blackthorn and bramble scrub and a large area of Japanese knotweed. The line of the former railway still supports grassland, which would be classified as species poor semi-improved grassland.

12.5.5 As a result of the dominant species poor vegetation type within this immediate area, it is considered that the SSSI would be relatively resilient to indirect impacts such as run-off and chemical deposition.

12.5.6 Elsewhere, The Greenway would be located close to the Combe Haven SSSI whereas the centreline of the carriageway would be further away. For example, at Decoy Pond The Greenway would be located 40m to the north of the SSSI boundary while the centreline of the carriageway would be located 100m to the north of the SSSI.

12.5.7 To the west, within the Combe Haven Valley itself, the wetland habitats are considered to have a greater sensitivity to impacts particularly as a result of leachate, chemical run-off and from salt spray. Within this area and at its closest point, the centreline of the carriageway would be located approximately 50m to the north of the SSSI boundary whereas The Greenway would be located approximately 10m from the SSSI boundary. At this point the SSSI contains Powdermill Stream, which is at a significantly higher water lever than the adjacent cattle grazed pasture. Powdermill Stream, at this location, supports a lowland trout and lamprey nursery. The value of this fish nursery was not assessed in the ES. The proposed Scheme would cross the Powdermill Stream to the north of the SSSI.

12.5.8 It is possible that contamination from leachate runoff and salt spray could have a negative impact on the trout and lamprey nursery as such fish nurseries are highly sensitive to pollution incidents. However, the water quality aim associated with the discharges from the Scheme would be to ensure that the existing water quality of the watercourse is maintained, incorporating substantial mitigation so that there would be no impacts on the SSSI associated with runoff. Please refer to Chapter 9 Water Quality and Drainage, Section 9.5 Mitigation Strategy of the ES for additional

details. The significance of impact from highway run-off as stated within the ES remains unaltered as neutral (Chapter 9 Water Quality and Drainage, Section 9.7.8).

Marline Woods SSSI

12.5.9 It should be noted that Figure 12.1B incorrectly illustrates the extent of ancient woodland within the vicinity of the London to Hastings railway. This is corrected in Appendix I.2 Figure 12.1 of this addendum. Figure 12.1B shows ancient woodland as extending from south of area W55 to the Crowhurst Road bridge. In fact, the area between Crowhurst bridge and W55 and W24 is largely scrub and is not designated as ancient woodland. The area of ancient woodland within the area to the west of the London to Hastings railway is located to the north of the boundary of the proposed Scheme overall footprint.

12.5.10 Marline Woods SSSI is located the east of the London to Hastings Railway Line and to the north of the proposed Scheme. At this point the Scheme would be located on a bridge over the railway line with embankments, noise fences and a parapet to the bridge. At this location the Marline Woods SSSI extends as a thin (<7m) triangle of woodland and scrub beneath the proposed road bridge. It is calculated that less than 30m² of SSSI woodland would be located beneath the proposed structure. The wing walls to the proposed bridge would extend northwards and parallel to the eastern boundary of the SSSI for approximately 50m. In this area the SSSI is no wider than 17m and all of the proposed construction work would occur outside of the SSSI i.e. machinery would be operated on land to the east of the SSSI boundary. As a result there would be no direct loss of land from the SSSI. The close proximity of this construction could result in potential indirect impacts upon the SSSI such as dust (soiling vegetation), noise and litter. However, this area of the SSSI is not designated as ancient woodland, although, 50m to the north of the railway bridge entrance the woodland is designated as ancient and semi-natural (not replanted) woodland.

12.5.11 To the west of the railway line opposite Marline Valley Woods SSSI is located an area of designated ancient woodland. The wing walls of the proposed bridge structure would be located at least 2m to the southern edge of the woodland. Modifications would be made at the Detailed Design stage so as to avoid direct impact upon the woodland. The close proximity of the construction to the woodland would be likely to result in an impact on tree root zones and indirect impacts upon this area of Ancient Woodland such as noise, dust and litter. Mitigation would include the creation of a buffer strip, defined by tree protection fencing located for the full extent of the tree canopy so as to prevent access by machinery and construction staff. This tree protection fencing would be ‘reinforced’ with fencing suitable to preventing litter and reducing dust from entering the SSSI. The significance of construction dust impacts (with respect to soiling of vegetation), is considered as moderate adverse, as stated in the ES (Chapter 10 Air Quality, Section 10.4.14).

12.5.12 Indirect impacts from noise at the construction and operational stage in Scheme development are likely to be on over wintering and breeding birds. Mitigation would include noise fencing and natural screening. The impact significance is not altered from minor adverse, as stated within Chapter 12 Nature Conservation of the ES.

12.5.13 Additional information with regards to specific mitigation for noise and air quality can be found at Section 11.4 of the ES and Chapter 10 of this Addendum to the ES (air quality).

The Function of the Woodland Contiguous with the SSSI should be Considered (Summary point 4)

12.5.14 The construction of the proposed bridge structure over the London to Hastings Railway would result in the creation of a gap within the woodland corridor linking Marline Woods SSSI to woodland areas to the south. This gap would be approximately 25m wide but would be minimised by shade tolerant planting under the bridge. The existing corridor area that would be impacted does not comprise of high canopy woodland but an area of dense scrub. Marline Woods is connected to two other main areas of semi-natural ancient woodland via a corridor of woodland along the railway line. Approximately 400m to the south of Marline Woods SSSI is located Monkham Wood and approximately 450m to the south-east lies Redgeland Wood. These two woodlands are included within the Combe Haven Valley SSSI, although only the southern section of Redgelands Wood (to the south of the railway line) is included. However, this otherwise continuous corridor of woodland is already broken by the Crowhurst Road bridge over the London to Hastings railway which creates an east to west break. Equally, the London to Hastings railway forms a continuous north to south break in woodland habitat separating Marline Woods SSSI from Combe Haven SSSI. These two features form a complete barrier i.e. there is no vegetation linking either side of Crowhurst road or the railway line.

12.5.15 The construction of the new bridge over the railway line would contribute to this fragmentation of habitat. However, over time the width of the gap created by the construction of the bridge would reduce as planted trees and shrubs on the embankment mature and the break in the corridor is reduced to 8m i.e. the width of the carriageway. It is not expected that these trees and shrubs would ever grow to be linked either over or beneath the bridge. In addition the railway bridge is sufficiently high (8-10m) to allow planting of shade tolerant species such as hazel, hawthorn, ivy, and holly under the structure (please refer to Chapter 6.0 of the Design and Access Statement). This would assist in providing habitat linkage between woodland/scrub to the north and south of the proposed Scheme. The significance of impact is not altered from minor adverse, as determined within the ES (Chapter 12 Nature Conservation, Section 12.6.15) for the loss of ancient woodland contiguous with the Marline Valley Woods SSSI.

Fragmentation and Isolation of Combe Haven (Summary points 5 and 18)

12.5.16 The Combe Haven SSSI, which is situated to the south of the proposed Scheme, would not be fragmented by the construction of the Scheme and would remain the greater part of the flood plain south of the proposed Scheme. However, habitat within the wider area to the north of the proposed Scheme would be separated by the Scheme from the habitat to the south of the Scheme, which is adjacent to the SSSI. Between Hillcroft Farm and Adam's Farm a total of 8 hectares (ha.) of lowland grazing marsh habitat (known as Powdermill Valley) would be isolated from the main area of the Combe Valley, located to the south. This area is bordered to the north and west by arable land which support generally poor hedgerow structures. To the

east lie the grounds of Adam's Farm with associated mature hedgerows, linear woodland strips and the disused Crowhurst, Sidley and Bexhill Branch railway line.

12.5.17 To the west, between Hillcroft Farm and Hanging Wood, a total of 7ha. of grazing marsh habitat, located to the north of the road would be partially severed from the grazing marsh to the south. Again, habitat linkage to the north and east is generally poor as the area is dominated by pastoral and arable land, although habitat linkage to Hanging Wood to the west is moderate due to the existence of mature hedgerows.

12.5.18 The Scheme would include east to west linear scrub planting that would provide linkage to and between these two areas of severed habitat. When the planting matures it would also increase the scrub linkage across the valley in an east to west direction restoring connectivity. However, linkage of grazing marsh would remain fragmented and the scrub planting along the Scheme embankments would increase this isolation. However, compensation for this loss has been made in the Environmental Design.

12.5.19 There are five river crossings proposed within the Combe Haven valley, one over the Combe Haven itself, two over the Powdermill Stream, one over the Watermill Stream and a final crossing over the Decoy Stream.

12.5.20 The following green engineering principles would be incorporated into the mitigation strategy at the Detailed Design stage for river crossings:

- All bridges would be single clear span structures that span the width of the channel, therefore avoiding any direct impact on the river bed sediment, channel habitat and fish passage;
- Set-back abutments from the river channel would allow for a minimum of 2m bank section between the top of the bank of the watercourse and the bridge on both sides. This would allow continuation of the riparian corridor beneath the bridge, allowing this area to be feely utilised by dispersing animals;
- Microclimate conditions would be considered when establishing vegetation, as soil moisture deficit and reduced light levels may restrict the type of bank top and face vegetation that can be established. Any invasive weed growth would be monitored and controlled as part of the management strategy; and,
- Careful consideration would be given to the potential for channel bed and bank erosion as a result of bridge structures. Natural reinforcement measures would be considered if required.

12.5.21 The green engineering principles would allow for species to travel beneath bridge structures. The principles avoid artificial barriers that could restrict the movement of mammals such as badger, otter, water vole and water shrew.

12.5.22 Species of greater mobility, such as birds and otter and plants with wind dispersed seeds should not be subject to significant levels of fragmentation. Less mobile species such as molluscs may experience fragmentation of populations. However, areas of land isolated to the south and north of the Scheme are considered to be sufficiently large in area to maintain viable populations of these less mobile species.

12.5.23 Please refer to the Design and Access Statement Addendum for further details of the bridge design at this stage.

12.5.24 The bisection of the mature hedgerow bordering Crowhurst Road, the railway cutting at the western urban end of the route and the hedgerow bordering Decoy Pond stream would be significant. However, prior to mitigation the bisection of these hedgerows would be compensated for by continuous linear planting along the embankments of both sides of the carriageway, creating links between severed hedgerows and isolated woodland. For example, the small block of woodland to the south-west of Acton's Farm which currently is largely isolated within an arable field would benefit from increased connectivity due to proposed hedgerow planting.

Adequacy of Mitigation and consideration of Short - Medium Term Impacts. (Summary points 7, 8, 9, 10 and 11).

12.5.25 As agreed with NE, EA and ESCC's County Ecologist, mitigation for the loss of habitat as a result of the Scheme is to be provided on a two for one basis of habitat restoration and creation, with the creation of extensive linear planting of shrubs either side of the carriageway and extensive balancing ponds with associated wetland features. This agreement is detailed in Appendix I.3 Records of Consultation (Notes of a meeting held 12.6.06 At County Hall). The replacement of loss of habitat of more than one for one has been justified because of the unpredictability of habitat creation, and the need to meet the key principles of Planning Policy Statement 9 (PPS 9) for compensation and mitigation measures. Scrub planting associated with the Scheme may take a considerable period of time to develop into a habitat that is widely used by breeding birds and dormice. For example, scrub planting may not achieve a structure suitable for dormouse until it is 10-15 years old. A little before this age, scrub structure would become suitable for nesting birds. However, grassland that is to be sown between the scrub would begin to develop within a short period of time creating habitat that would be utilised by invertebrates and small mammals. Therefore, once completed the Scheme would begin to provide habitat for wildlife immediately. Similarly with the water bodies to be created, invertebrates would quickly colonise a body of water and it is likely that simple ecosystems would have developed within a year following the completion of the Scheme. Although it is anticipated that it would take 10 years for a diverse ecosystem to have developed, the act of colonisation should be viewed as an integral part of the habitat creation process. In addition, and where possible, ecological mitigation should be programmed into the Scheme development so that a phased approach is adopted, allowing for ecological enhancement to commence as early as possible throughout the construction stages of the Scheme.

12.5.26 The extent of habitat loss and replacement as a result of the Scheme is included in the Schedule of Wildlife Areas within the Design and Access Statement and amended in the Design and Access Statement Addendum. Habitat restoration and creation would include scrub planting along the road embankments to create linear habitat linkage along the route which would restore connectivity to bisected hedgerows and create connectivity across the floodplain. Planting and planned management of areas of grassland would add biodiversity value by providing additional habitat of a scrub/grassland mosaic, and the creation of wetland habitats. Scrub planting would consist of species suitable for dormice and of local provenance, such as hazel, blackthorn, hawthorn, field maple, honeysuckle, oak and ash. Dry grassland species would be in character with National Vegetation Classification (NVC) community MG5, crested dog's tail and black knapweed *Cynosurus cristatus – Centaurea nigra* mesotrophic grassland, which is appropriate for species rich grassland, and includes species such as black knapweed, yorkshire-fog, red clover, white clover and common bird's foot trefoil.

12.5.27 There would be a transition from dry grassland through to wet grassland, moving into riparian environments and then open water. Wet grassland species would include yorkshire-fog, ragged robin, marsh marigold, yellow iris and water mint, which would create a diverse transitional environment, and prime foraging habitat for UK BAP target species of reptiles (such as grass snake), birds (such as sky lark, spotted flycatcher and reed bunting), invertebrates and species of bat. Riparian environments of fen grassland and reedbeds would mark the transition into open water.

12.5.28 Additional wetland habitat mitigation would be provided by the Powdermill borrow pits. This area would be designed and landscaped to create a variety of wetland habitats through creating shallow, marginal, deep water zones and additional reedbed habitat.

12.5.29 With regard to the likely effectiveness of the mitigation, this would be determined by a range of factors such as species to be planted, water depths, soil types to be used for habitat creation, provenance of planted species, plant establishment rates and sources of potential colonisation. Critically, the 'effectiveness' of the habitat recreation would be dependent on and determined by the objectives of the conservation management plan to be prepared for the Scheme. Please refer to Section 12.6.9 below for further details of a conservation management plan, which would be prepared on behalf of ESCC and agreed by with the Planning Authority and its consultees.

12.5.30 Mitigation would also include specific protected species mitigation, as detailed in Table 12.18 of the ES. This would be carried out under NE licensing where required. Surveys are currently being undertaken which will fully ascertain the extent and nature of this mitigation; additional specific species mitigation measures would be incorporated in to a mitigation strategy for the Scheme. A detailed ecological Master Plan is in production. Outline mitigation for protected species would include the measures described in Table 12.1 below.

Table 12.1: Outline of Protected Species Mitigation

Species	Mitigation outline
Dormouse mitigation and compensation	To be carried out under a NE licence and would include the provision of scrub planting that would create corridors east to west along the route of the link road. In addition, north to south links would be created by narrowing the distance between scrub across the carriageway and by providing dormouse walkways beneath underpasses.
Bats	Mitigation would be informed by on-going field survey work. However, this would involve the erection of bat boxes within trees surrounding the scheme, the incorporation of bat roosting features within underpasses, as agreed with the Planning Authority, maintenance and creation of foraging routes and commuting corridors and the sensitive positioning of lights (none of which are to be included within the countryside section of the road).
Birds	Mitigation would include extensive scrub planting and the creation of wetland areas.
Reptile mitigation and compensation	To include the translocation of animals from the development footprint to suitable receptor areas of retained habitat adjacent to the Scheme. Verges would be planted with a mosaic of grassland and scrub to provide additional habitat for reptiles.
Great-crested newt mitigation	Works would be carried out under a NE licence. Mitigation and compensation would include the translocation of animals away from the development footprint, the creation of new breeding ponds and the creation of terrestrial habitat along side the Scheme.
Badger mitigation	To include the closing of setts under a NE licence, on the Scheme route and the creation of artificial setts combined with additional scrub and grassland planting providing additional foraging habitat. To the west badger passes are to be installed on the road bridges so as to maintain links across the carriageway.

Impact of Change in the Chemical Environment. (Summary points 12 (part) and 15).

12.5.31 The impact of increased atmospheric concentrations of oxides of nitrogen (NO_x) and nitrogen (N) deposition on plant growth and potential changes within ecosystems has not been clearly established although there is a growing body of research indicating the impacts. Current research suggests that both may lead to increased rates of plant growth, changes in species interactions and ecosystem functions. At low concentrations plants are able to detoxify and assimilate gaseous nitrogen compounds. At higher concentrations foliage damage and change in physiology and growth rates occur. Genotypic and phenotypic differences in plant response to both NO_x and total nitrogen availability would have an effect on intra- and inter-specific competition and ultimately on community composition. Therefore the impacts of increased levels of NO_x and N are extremely complex and will be dependent on weather, soil types, drainage, existing nitrogen levels, plant communities present and sensitivity of species to changes in nitrogen levels.

12.5.32 In the majority of ecosystems plants are limited in their growth by the amount of nitrogen available to them. When more nitrogen becomes available all plants grow more. Some nutrient demanding species such as grasses are able to crowd out species adapted to low nitrogen thus changing community composition. It has been assumed that significant changes in nitrogen levels would therefore have this effect on plant communities adjacent to the proposed Scheme.

12.5.33 The DMRB guidance (DMRB, Vol. 11, Section 3, Part 1, May 2007) advises that assessment of potential air quality effects on vegetation should be carried out on Designated Sites, for the base year (2004) and opening year (2010). These years represent the most sensitive (i.e. worst) years for ecological receptors as background concentrations of pollutants across the UK are anticipated to reduce in future years. This is the approach that has been adopted in the DMRB, and the Assessment of Air Quality Effects on Designated Sites report (refer to Appendix G for the full report).

12.5.34 The assessment considered the impacts of atmospheric NO_x concentrations and Nitrogen (N) deposition on the Marline Woods and Combe Haven SSSI's. Receptors were modelled representing transects across the Designated Sites at increasing distances from the affected roads (Section 3.3 of Appendix G), so as to determine NO_x and NO_2 concentrations at specific locations.

Oxides of nitrogen

12.5.35 The pollutant of most concern for sensitive vegetation near roads is NO_x. NO_x is composed of nitric oxide (NO) and its oxidation product Nitrogen Dioxide (NO_2). For vegetation, it is the latter that is of importance, since plants are limited in their growth by nitrogen. Concentrations of NO_x are higher close to roads, so vegetation in these areas is exposed to a larger source of N, which may act to alter plant community composition at these locations.

12.5.36 The assessment of increases in NO_x concentrations at Designated Sites as a result of the Scheme includes the assumptions that increases in NO_x concentrations are potentially significant when:

- The proposed Scheme is predicted to cause an increase in annual mean NO_x concentrations of at least 2 $\mu g.m^{-3}$; and,
- Predicted concentrations (including background) are very close to or exceed the criterion of 30 $\mu g.m^{-3}$. 'Very close to the criterion' is assumed to be 29 $\mu g.m^{-3}$ for the purposes of this assessment.

12.5.37 The assessment shows that without the proposed Scheme, exceedences of the annual mean NO_x limit value of 30 $\mu g.m^{-3}$ are predicted to occur in 2004 and 2010 at areas of the Marline Valley Woods SSSI closest to the B2092 Queensway. With the Scheme, exceedences also occur at locations near to the Combe Haven SSSI and increase the area of exceedence within Marline Valley Woods SSSI. Therefore, the assessment has determined that the proposed Scheme would lead to potentially significant increases in NO_x concentrations in small areas of the Combe Haven SSSI and Marline Valley Woods SSSI (adjacent to the B3092 Queensway). The location of these areas of potentially significant change are shown on Figure A.4 of Appendix G.

12.5.38 The impact significance of NO_x concentrations on Designated Sites has not been altered from potentially critically negative as stated within the ES (Section 10.4.79). However, the areas that are identified from this additional assessment as being potentially significant for changes in NO_x concentrations as a result of the Scheme are limited to additional areas of Marline Woods SSSI and an area (approximately 1.2ha) of Combe Haven SSSI nearest to the Scheme.

Nitrogen (N) deposition

12.5.39 Increases in N deposition at Designated Sites as a result of the Scheme are concluded to be potentially significant when the critical load for the site is exceeded.

12.5.40 The baseline assessment shows that areas of the Combe Haven SSSI and Marline Valley Woods SSSI are predicted to exceed the critical loads for N deposition, where specific habitat types and background concentrations are present, in 2004 and 2010. Average Nitrogen deposition rates for the two SSSIs are based on the UK Air Pollution Information System (APIS) habitat classifications, as detailed in Table 4.2 of Appendix G. Critical loads applied for Marline Valley Woods SSSI and Combe Haven SSSI are equivalent to the APIS defined critical loads for 'Temperate and boreal forests' and 'Low and medium altitude hay meadows' which are the two habitats of relevance to these SSSIs. Tables 4.4 to 4.10 of Appendix G of this Addendum to the ES show that the critical loads for Combe Haven SSSI and Marline Valley Woods SSSI are exceeded in the following circumstances:

- In 2004 *and* 2010, for areas where the high background nitrogen deposition rates associated with Ash Woodland, Oak Woodland, Urban Woodlands or Ancient/Species Rich Hedgerows habitats are present but only when the critical load for "temperate and boreal forests" is applicable; and,
- In 2010 with the Scheme proposals, for areas where the high background nitrogen deposition rates associated with Ash Woodland, Oak Woodland, Urban Woodlands or Ancient/Species Rich Hedgerows habitats are present but only when the critical load for "temperate and boreal forests" is applicable.

12.5.41 It is therefore shown that the proposed Scheme would cause an increase in nitrogen deposition within Combe Haven SSSI and Marline Valley Woods SSSI in 2010, but that this is at locations where exceeded critical loads are already occurring due to existing concentrations. The Scheme is not predicted to cause new exceedences of the critical loads at any location or for any habitat type. All identified exceedences are predicted to occur with or without the Scheme. The maximum increase in nitrogen deposition, as a result of the proposed scheme, is 0.7 kg N Ha^{-1} y^{-1} for Combe Haven SSSI and 1.1 kg N Ha^{-1} y^{-1} for Marline Valley Woods SSSI. By applying the lower threshold for critical loads for temperate and boreal forests, which is the only APIS defined habitat that the critical loads are exceeded for when the appropriate habitat background levels are applied (e.g. Ash Woodland, Oak Woodland, Urban Woodlands or Ancient/Species Rich Hedgerows), this represents 6.5% of the critical load for Combe Haven SSSI and 10.7% of the critical load for Marline Valley Woods SSSI. The results therefore show that, where exceedences of the critical load occur, it is primarily due to existing background concentrations, which show exceedences of up to 186.6% of the critical load (lower threshold) for some areas of Marline Woods SSSI in 2010.

12.5.42 Exceedences are shown as a percentage of the critical load in Table 12.2 for the Do Minimum scenario in 2010, and with the Scheme for the Do Something scenario The change as a percentage of the critical load (lower threshold) is also included.

Table 12.2: Change in Total N Deposition and Exceedence as a percentage of the critical load in 2010 as a Result of the Proposals.

SSSI	Distance to Road Centre (m)	Total N Deposition 2010 (kg N Ha^{-1} y^{-1})		Exceedence as a % of the critical Load		Change as a % of the Critical Load
		Do Minimum	Do Something	Do Minimum	Do Something	
Combe Haven	46	27.95	28.60	179.5	186.0	6.5
	70	27.95	28.44	179.5	184.4	4.9
	115	27.95	28.29	179.5	182.9	3.4
	175	27.95	28.19	179.5	181.9	2.4
Marline Valley Woods (nr Link Road)	9	28.05	29.12	180.5	191.2	10.7
	70	28.04	28.32	180.4	183.2	2.8
	115	28.03	28.23	180.3	182.3	2.03
	175	28.02	28.18	180.2	181.8	1.6
Marline Valley Woods (near B2092 Queensway)	12	28.66	29.25	186.6	192.5	5.9
	70	28.11	28.32	181.1	183.2	2.1
	115	28.05	28.19	180.5	181.9	1.4
	175	28.01	28.12	180.1	181.2	1.1

12.5.43 The worst case scenario is demonstrated to be at locations closest to the proposed road. A 1% change significance threshold is applied to these sites, in accordance with NE Best Practice and the EA's IPPC Environmental Assessment for Designated Sites. Any exceedence of this threshold will require further assessment from an ecological perspective. This is carried out in Sections 12.5.45 to 12.5.49 below.

12.5.44 It should be noted however, that the calculations presented in Table 12.2 represent a worst case scenario, with lower critical load thresholds applied. The modelling presented in Appendix G assumes that the proposed link road is at the same height at both SSSIs. In reality, the proposed Scheme would be approximately 7.5m below the level of Combe Haven SSSI and between 8 and 13 m above the SSSI at the closest point to Marline Woods SSSI. DMRB guidance states that placing the road in a cutting or on an embankment can increase the distance between a roadside

receptor and the vehicles thus allowing more time for dispersion and reducing concentrations at the receptor (DMRB, Vol. 11, Section 3, Part 1, May 2007). The calculations presented here are therefore likely to be a conservative estimate.

12.5.45 It would be anticipated that for all locations within the Air Quality assessment of designated sites, plant communities will succeed towards communities where nutrient demanding species dominate the communities present. This process may occur in the future, or may have occurred already within the study area as critical loads are already being exceeded by more than 175%. Therefore any increase in nitrogen deposition as a result of the Scheme would be of neutral significance for habitats present. However, a change in vegetation composition as a result of nitrogen deposition, with or without the Scheme, would result in communities dominated by nutrient demanding species. These are generally less diverse and of lower ecological value than communities where nitrogen levels are low. An increase in nutrient demanding species could be compensated for by appropriate management, such as the removal of biomass which results in a reduction in nutrient levels. Biomass removal can be achieved through cutting grassland for a hay crop and by grazing with animals.

12.5.46 Bryophyte communities are likely to be the most sensitive to nitrogen deposition. It is considered that an increase in nitrogen levels within these bryophyte communities would result in a decline in species of greater sensitivity. This is likely to include those Atlantic species for which the Marline Valley SSSI site has been designated as a SSSI. The most important factors in determining whether there is likely to be a change in the community present will be the distance from the road in which nitrogen levels increase, the distribution of bryophyte communities in relation to the road and the sensitivity of each of the species concerned.

12.5.47 A survey carried out by Simon Davey in November 2006 (The Lower Plants of an Area of Marline Woods, Davey, November 2006. Please refer to Appendix I.4) reported that the:

'nearest lichen of real interest is on a large oak at TQ77801194 and is Opegrapha corticola. This is an ancient woodland indicator used to calculate the New Index of Ecological Continuity. Another species in this general area of oak and chestnut is Arthonia vinosa. Though not seen on this occasion, it was recorded here in 2005'.

This record of *Opegrapha corticola* was located approximately 100m to the west of Queensway and some 900m north of the proposed London-Hastings Railway overbridge and as a result the record falls outside of the area of the SSSI experiencing significant changes in NOx concentrations as indicated within Appendix G Assessment of Air Quality Impacts on Designated Sites.

Within Park Wood at TQ 77640 11920 Davey reports:

'The total absence of the lichen Xanthoria parietina, and any other members of the genus Xanthoria on oak twigs and branches indicates that there is little or no eutrophication from intensive farming in the area, or ammonia from car exhausts. The presence of the lichen Parmotrema perlatum also indicates no sulphur dioxide pollution from any processes such as brick works, fossil fuel power stations etc.'

12.5.48 This is the only time within the report that species that are sensitive to pollution are mentioned. This area is located some 260m west of Queensway and 850m north of the proposed London-Hastings Railway bridge. The area falls outside of the area of the SSSI experiencing significant changes in NOx concentrations as indicated within the Assessment of Air Quality Impacts on Designated Sites. It is possible that the reason these sensitive species occur at this distance from the proposed Scheme alignment is related to current levels of air pollution associated with the adjacent road (Queensway).

12.5.49 Since critical loads of NO_2 are shown to be exceeded in all locations and for all habitat types with or without the Scheme, and since the location of bryophyte species of interest have been recorded outside of the areas of potentially significant increases on NOx concentrations, the impact on bryophyte communities as a result of the Scheme is considered to be neutral.

Acid deposition

12.5.50 The reaction products of NO_x, SO_2 and NH_3 (nitrate, sulphate and ammonium) have the potential to cause acidification. However, due to prolonged residence times of NO_x in the atmosphere, contributions to acidification (through deposition) occur over distances of between 150 and 1,000 kilometres from the source. As such, 70% of oxidised nitrogen from the UK is exported, and some of the oxidised nitrogen deposited in the UK is from abroad. Government guidance advises that N deposition in terms of acidification and wet deposition is subsequently a regional issue rather than a local one. Therefore, assessment of effects on designated sites close to roads is not required. The contribution of the proposed Scheme to regional emissions has been addressed within the ES.

Drains have been included as mitigation for runoff during the operation phase but clarification is required on how this has been considered with regard to storm/flooding events (Summary point 13).

12.5.51 Flooding and runoff issues have been revisited in Chapter 9 Water Quality and Drainage of this Addendum to the ES. In addition, Section 9.5 of Chapter 9 Water Quality and Drainage of the ES address the mitigation strategy for impacts from the Scheme on Water Quality and Drainage. Section 9.5.25 details the proposed mitigation with respect to flooding events.

Potential impacts of discharge from road drainage and leachates from construction on downstream habitats. Potential impacts of runoff and pollution on birds and mammals; and impact of Salt Spray on Marline Wood SSSI (Summary points 12 (part), 14 and 16).

Leachates, runoff and pollution

12.5.52 Potential impacts from leachates into groundwater at the construction stage are discussed in Section 9.6.17 of the ES. A Construction Environmental Site Management Plan (CEMP) would include measures to reduce the impact of leachates into groundwater. A CEMP would normally be the responsibility of the successful Contractor and would be prepared prior to the start of construction works

on site. The scope and content of the CEMP should be agreed with the Planning Authority with this requirement envisaged to be conditioned as part of the Planning Approval for the Scheme.

12.5.53 At the construction stage, there is potential for works to mobilise large volumes of sediment which could discharge into nearby watercourses causing adverse impacts on habitats. Impacts may include decreasing light penetration retarding photosynthesis and clogging the gills of fish. However, mitigation measures to eliminate the impact of suspended sediment from construction activities are described in Chapter 9 Water Quality and Drainage, Section 9.5 of the ES. The CEMP would be developed so as to manage those elements of construction works that have potential to cause adverse effects on the water environment, and these measures would be agreed with the EA and other statutory consultees. A temporary site drainage system would be developed to implement the appropriate mitigation measures detailed in the CEMP. The site drainage system would include generic construction mitigation measures, as detailed in Section 9.5.36 of the ES. The impact at the construction stage is therefore assessed as minor adverse for a temporary period.

12.5.54 Routine highway runoff often includes a variety of contaminants such as hydrocarbons, fuel residue, heavy metals and oil that can lead to chronic water pollution in receiving water bodies. Chronic pollution tends to produce non-lethal effects, but does cause the continuous degradation of the quality of the receiving environment, and can be potentially detrimental to wildlife. For example, pollution from runoff can result in reduced oxygen levels within the receiving waterbody, which may be sufficient to exact a direct toxic effect on aquatic species and/ or reduce oxygen levels below that required to support a diversity of flora and fauna upon which invertebrates and fish feed. Table 9.16 of the ES gives a generic list of potential pollution impacts on fish, invertebrates and plants. In addition, reduced oxygen levels may have a follow on impact on food supplies for birds and mammals. It is also possible that toxins introduced into a watercourse could become concentrated in the body tissues of higher trophic level species of birds and mammals through a process of bioaccumulation. However, the Water Quality Assessment presented in Chapter 9, Water Quality and Drainage of the ES, states that the water quality of receiving watercourses is unlikely to be adversely effected by routine runoff from the proposed Scheme (Section 9.7.8 of the ES). The drainage mitigation for the Scheme (Section 9.5 of the ES) would be so that the significance of impact from highway runoff and pollution is considered to be neutral.

Salt spray

12.5.55 Section 9.7.13 of the ES discusses the impacts from salt spray. Salt spray from the proposed Scheme may impact on vegetation locally. In addition run-off may contain salt from roads. This salt may have the impact of localised vegetation die-off and localised changes in vegetation communities to one that has a higher proportion of salt tolerant species. Certain tree species are less susceptible to salt than others and the sycamore is a species regularly found where salt levels may be high such as in coastal locations. However, the majority of species would suffer from leaf die-off from salt deposited on leaves, although this may not actually kill the plants. The

Design Manual for Roads and Bridges (DMRB), Ecology and Nature Conservation, Volume 11 states in 5.1 (i) that:

'on verges 5m from the hard shoulder, the concentration of salt in the soil is a negligible hazard to many plants. Exceptions to this may be more sensitive and specialised species which can be grown within a small range of chemical tolerances'.

12.5.56 The woodland associated with Marline Valley Woods SSSI extends beneath the London to Bexhill Railway line bridge structure and is therefore within this 5m zone of impact from salt spray. However, the bridge is to be flanked by concrete walls which would have the effect of deflecting salt spray so that the vegetation would only receive a low level of salt input. Furthermore, since the application of salt within this area of south-east England is anticipated to occur on infrequent occasions throughout the winter period when no leaves are present, impact is further reduced. The Local Highways Authority maintain their highways in accordance with national codes of practice ('Well Maintained Highways' CoP 2005) and local policies ('ESCC Winter Service Policy 2007/2008'), which seek to minimise salt usage as consistent with Section 111 of the Railways and Transport Act 2003. This provides a duty of care on a Highway Authority to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow and ice. The local code of practise therefore recommends minimum salt applications without compromising safety.

12.5.57 In consultation with the EA (22/07/08; please refer to Appendix B.1 for a record of this consultation), the following best practice guidelines to reduce the impacts of de-icing salts on the aquatic environment would be adopted:

- Discharge to watercourses would not be concentrated at one site, and would be directed to the lower risk areas where sensitive ecological receptors such as fish spawning or nursery sites, including silt lamprey habitat and crayfish refuge habit would be avoided;
- All discharges would be controlled through a detailed SuDs scheme incorporating a combination of grass swales and retention ponds to control discharge of run-off. Details of the proposed SuDs scheme are included in Section 4.2 of the FRA (Faber Maunsell, 2008); and,
- All drainage measures would be routinely monitored to identify any potential changes where drainage routes may need to be modified to mitigate impacts.

12.5.58 DMRB, Ecology and Nature Conservation, Volume 11 states in 5.1 (i) that:

'Spray damage is usually unsightly rather than life-threatening to plants, although it may have adverse effects on sensitive habitats containing communities or populations of plants with specialist requirements'.

12.5.59 It is anticipated that due to the winter application of salt, there would be a negligible impact on the Marline Woods SSSI. The Atlantic bryophytes for which the woodland is designated are typically associated with the west coast of the UK, and as a result are moderately salt tolerant. Given this moderate salt tolerance of these species it is considered that it is unlikely that there would be any impact on these species should they be found to occur within 5m of the carriageway. The Combe Haven SSSI is sufficiently distant from the Scheme i.e. greater than the 5m zone of effect for there to be no impact on vegetation associated with the designated site. However, leaching of salt into watercourses may have an impact on aquatic species. The lamprey and trout nursery associated with the Powdermill Stream would be unlikely to be affected by salt within surface water runoff and as the stream is at a significantly higher level than the Scheme drainage design. In addition, due to the relatively small surface area of the Scheme, the high dilution capacity and treatment of flows provided by the proposed drainage mitigation (Section 9.5 of the ES), the significance of impact from salt is considered to be minor adverse without mitigation and neutral with mitigation (Section 9.7.15 of the ES).

Effects on bats are not adequately addressed. (Summary point 6);

And,

Further bat survey work should be undertaken to inform mitigation. The ES also fails to assess the severity of the impact on bats from severance of foraging and commuting lines. (Summary point 23);

And,

Light disturbance on nocturnal species, such as bats, should be considered. (Summary point 20).

12.5.60 Based on the field survey carried out between 2004 and 2007 there is one building supporting a bat roost which would be lost as a result of the Scheme. This building is the traditional barn located to the east of Adam's Farm. The smaller pig-sty located to the east of this building had no current evidence of bat usage and provides a low potential for roosting bats. The traditional barn is known to support a low status long-eared bat (presumed to be brown long-eared bat) roost which is utilised on an occasional basis. It is considered that this roost forms a satellite roost to a larger roost present within Adam's Farm. In addition, in 2006 a bat roost was reported within the school on London Road, located at the west end of the Scheme.

12.5.61 The traditional barn at Adam's Farm is to be subject to additional survey in 2008, although it is anticipated that the 2008 survey results will confirm those reported in 2006 and 2007. If this proves to be the case, mitigation and compensation would be required to provide alternative roosting for a small number of long-eared bats. Although it is often stated that long-eared bats require large voids in which to roost, this is not the case for low status roosts and small numbers of long-eared bats would readily utilise bat boxes. For example, ECOSA monitor a site in Chelmsford, Essex where up to 15 brown long-eared bats readily utilise a single box through the summer months. It is therefore proposed that the erection of bat boxes would provide suitable mitigation for the loss of the traditional barn. It is proposed that a total of 20 bat boxes are erected within suitable trees within the near vicinity of the

traditional barn. These would comprise a mixture of traditional wooden bat boxes and Schwegler woodcrete boxes erected in suitable trees in 100m of the barn and preferably in trees linked to the barn via a corridor of hedgerows. These boxes would be erected on Scheme land where suitable trees exist.

12.5.62 The school on London Road is to be accessed in 2008 to determine whether a bat roost is present. If this roost is confirmed then the proposed mitigation outlined above would be appropriate to the status of the roost.

12.5.63 There are no further bat roosts currently known to exist within buildings that would be lost as a result of the Scheme. Bat roost inspection, transect surveys, dawn, and dusk emergence surveys are ongoing at the following locations during 2008:

- Adams Farm tree belt;
- Actons Farm and hedgerows;
- Dismantled railway at Adams Farm (survey includes all outbuildings and bridges);
- Track at the bottom of Bynes;
- Chapel wood;
- Hedgerow and potential roost trees between little bog and decoy pond wood;
- Wooded Copse on West of active railway line (includes roost inspection of oak trees); and
- Base of Marline Wood and Fire training land.

12.5.64 In additional to the above bat survey investigations the following locations are also being assessed for activity and potential commuting route impacts:

- Hanging wood and Cole Wood;
- Upper Wilting Farm; and,
- Glovers Farm Buildings.

12.5.65 There are at present no bat roosts confirmed within trees along the route of the proposed Scheme, although there are a number of trees along the route that provide potential bat roosting areas. Tree roosts are notoriously difficult to confirm due to the often sporadic level of usage that these roost locations may receive. However, as a precautionary approach all trees identified within the ES as having bat potential would be felled using methods sympathetic to the conservation of bats. This would include a visual inspection and possible emergence survey of all trees suitable for supporting roosting bats immediately prior to felling. In addition, felling works would only take place during the spring and autumn periods when bats are less susceptible to disturbance. The exact number of trees to be lost along the route of the Scheme is not known and these are to be identified as part of the survey in 2008.

12.5.66 It is proposed that for each suitable bat roost tree to be lost a total of four bat boxes would be erected within suitable trees located within 100m of the felled tree. These would consist of two Schwegler woodcrete boxes and two traditional wooden boxes per tree. These boxes would be erected in mature trees which would not be subject to illumination or disturbance by the Scheme during the construction or operational phases.

12.5.67 Additional compensation would be provided along the route of the Scheme. For example, the bridges to be constructed over Powdermill and Watermill Streams would contain cavities that would allow bats to roost adjacent to the waterways. These cavities could be cast into the concrete structures and would consist of voids measuring 200mm high by 150mm deep by 200mm wide. These voids would be accessible via a slot measuring 100mm wide by 20mm high. The voids would be placed as high as possible on the underpass of the bridge and would not be located adjacent to lighting.

12.5.68 Chapter 12, Section 12.4.62 of the ES lists the key bat foraging and commuting hedgerows to be bisected by the proposed Scheme. Severance of the road in these areas would be unavoidable and difficult to mitigate in totality. However, it is known that bats are able to cross open areas, including fields and, in the case of some migratory British bats, open stretches of water. A 12m carriageway (including verges) should not present a barrier to bat movement. In all cases severed hedgerows are to be linked via linear planting that would extend along the full length of the carriageway providing additional foraging habitat and improving links within the wider area. Where major commuting hedgerows are severed scrub and tree planting would be extended across the linear planting on both sides of the road and across the verge so as to narrow the gap across the carriageway. The ‘tongue’ of planting extending across the verge on opposite sites of the road would need to comprise mature specimen shrubs to include blackthorn, hawthorn, wayfaring tree, dogwood as well as a number of mature feathered specimen ash, field maple and oak. This mature planting would be linked back to the severed hedgerow. This would narrow the road crossing point and create an immediate corridor that bats may utilise.

12.5.69 Linear roadside planting adjacent to the Watermill Stream and Powdermill Stream underbridges would extend as close to the entrance of the bridge as possible. This would have the effect of guiding bats towards the entrance of the bridge thereby crossing the road beneath rather than over the road.

12.5.70 There would be no illumination along the Scheme within the area of open countryside between Queensway and the proposed interchange with the distributor road at the North East Bexhill Development. Therefore, there would be no impact of increased lighting on bats in the wider countryside.

12.5.71 Natural England licences would be required for all works likely to disturb bat roosts. Currently this is only known to be required for the traditional barn at Adam's Farm.

The assessment of Dormice is unclear and contradictory. (Summary point 21).

12.5.72 The proposed Scheme is located within an area of countryside that generally has many features that provide suitable habitat for dormouse. The habitat to the north of the site is of particular value. This habitat extends north into the High Weald and has an extensive network of woodlands of varying size linked by hedges which, to a large degree, are managed sympathetically for dormice in this pastoral landscape.

12.5.73 The proposed Scheme forms a southern boundary to this high value area with the area to the south having fewer woods and, particularly in the flood plain of the Combe Haven, poorer quality hedges for dormice. Nevertheless dormice have been shown to be present south of the line of the road as well as along it and there is a network of linked dormouse habitat covering approximately 45-50ha south of the road. The extent of this habitat to the south of the road is considered to be sufficient to sustain a viable population of dormice.

12.5.74 Construction of the Scheme would have a direct impact on dormouse habitat where it would need to be removed. This would require that a NE licence is obtained and in order to obtain such a licence it will be necessary to demonstrate that the area of new habitat to be created would be sufficient to replace that lost. The total area of hedges and woodland and as such potential dormouse habitat which would be lost due to construction of the road is 3806m of hedges and 6.2Ha of woodland.

12.5.75 In addition, the construction of the road has the potential to isolate populations of dormouse to the south of the road in two ways. Firstly, by creating a barrier to dispersal between southern and northern populations. Secondly, because it is likely that the Combe Haven and its floodplain would form a barrier to dispersal from east to west for dormice south of the road. Dormouse habitat lost during the construction of the Scheme would be replaced by 21Ha of woodland incorporating 5600m of thickened woodland edge and at least 4250m of hedges of new planting within the Scheme area adjacent to the road. This is in accordance with guidelines from NE (Dormouse Conservation Handbook, 2006). Shrub and tree species favoured by dormice such as hazel, hawthorn, blackthorn, bramble, guelder-rose, hornbeam, oak, honeysuckle, birch and willow would form a major component of the planting and stock of local provenance would be used.

12.5.76 Removal of dormouse habitat would be done under the terms of a licence from NE which would not be granted unless the method statement conforms to guidelines in the Dormouse Conservation Handbook (Bright, Morris, and Mitchell-Jones, 2006).

Best practice varies through the year and the approach taken would therefore be determined by the timing of construction.

12.5.77 It would be necessary to address the impact of fragmentation by the road itself, as well as the effect of additional fragmentation in the river valley through appropriate planting that creates links between hedgerows and woodland areas and provides linkage across the proposed road.

12.5.78 In the past, it was considered that any break in dormouse habitat which caused them to cross the ground was a significant impediment to their movements. More recent evidence shows that they will cross the ground to reach isolated fragments of favoured habitat although the limits to this have yet to be determined. The existence of small dormouse populations, living in habitat fragments in the central reservation of dual carriageways shows that a single carriageway is not a complete barrier to dispersal (Paul Chanin, 2008, personal communication. Please refer to Appendix I.3 Records of Consultation, BHLR: Nature Conservation Chapter of the Addendum to the ES, meeting date 15th February 2008). Dormice have also been found in small fragments of habitat, an order of magnitude smaller than a home range, which are separated from nearby habitat by 15m of lawn (Simon Colenutt, 2008, personal communication). This indicates that they can cross gaps of this size during their day to day movements.

12.5.79 In a recent application for a dormouse licence by Dr. Paul Chanin the following guidelines were used as a guide to the impact of roads and accepted by Natural England:

- Small roads (<5m wide) were not considered a barrier to daily movements and it was assumed that dormice would cross them readily;
- Medium sized roads (5 - 10m wide) were considered a partial barrier in that dormice may not cross them in their daily movements but they would not prevent dispersal; and,
- Large roads (>10m wide) were considered a complete barrier to movements, including dispersal.

12.5.80 More recent evidence as detailed above suggests that these estimates may be conservative. They have however been adopted here. Since the carriageway along the Scheme varies between 14m and 17m for the most part, it is considered to be a barrier to dispersal.

12.5.81 There are four components to mitigation and compensation to be implemented under the proposed Scheme to mitigate for the impacts of the fragmentation of existing habitat:

- Natural links would be retained at the eastern end of the Scheme. Firstly by the planting of scrub beneath the proposed bridge over the London to Hastings Railway, and secondly by the extensive network of existing woodland between Redgeland Wood to the south and the B2092 Queensway to the north;

- Creation of dormouse walkways beneath the road which would be linked to newly created dormouse habitat by post and rail fencing against which suitable shrubs and creepers would be planted. The walkways would be constructed beneath river bridges, where appropriate, or underpasses for agricultural vehicles, along the central part of the Scheme. It is also considered possible that dormice may pass beneath the road on the ground using the 2m wide terrestrial corridor between the watercourse and the proposed underpass structure. Similar walkways would also be created along the southern face of bridges to connect dormouse habitat east-west across the streams. Please refer to Appendix J.3 (Figures 13.23 and 13.23 A to K) of this Addendum and Chapter 5 of the Design and Access Statement Addendum for the location of all river bridges and agricultural underpasses included in the habitat continuity plans. Please also refer to Figure 208/31/58 within the Design and Access Statement Addendum for details of proposed Dormouse tunnels;

- At three locations along the western, urban, end of the route where it passes mainly through railway cuttings the width across the road separating dormouse habitat would be reduced to 10.3m (7.3m road surface plus 2 x 1.5m verges) by extending scrub planting towards the road verges. Each of these tongues of scrub planting would extend for a minimum of 5m along the road verge and would be linked back to retained areas of scrub in locations where this can be achieved without compromising road safety but spaced along the road corridor. Please refer to Figure 13.23 C for the precise location of these scrub planting extensions; and

- Planting of trees and shrubs would take place along much of the length of the road corridor to promote connectivity along the road both north and south, as detailed in the Additional Habitat Continuity Planting (Figures 13.23 A to K) in Appendix J.3 of this Addendum. Planting would be designed not only to link habitat outside the corridor but also to connect crossing points described above as part of the mitigation strategy.

12.5.82 The road would be paralleled by The Greenway to be used for pedestrians, cyclists and horse riders. In some places The Greenway would form a single corridor. Elsewhere horse riders would be separated. The Greenway would range in width from 6m to 8.5m and would include up to 3.5m of bituminous surface with grass verges for cyclists and pedestrians or 3m of gravel/topsoil mix for horses. These dimensions are within the ‘medium sized roads’ category listed above and therefore not thought to be a barrier to dispersal by dormice. In practice, given the relatively low proportion of bitumen surface in relation to verges, likely low traffic volumes at night and recent advances in knowledge of dormouse movements it is considered possible that these would not form a significant barrier to dormice.

Great Crested Newt (GCN) Surveys were not in accordance with EN guidelines. Further survey work on GCN and reptile populations should be undertaken to confirm population size. The location of reptile receptor sites also needs to be clarified. (Summary point issue 22).

12.5.83 The construction of the road would result in the following impacts on GCN. Please refer to Figure 12.10 of the ES for the location of the ponds:

- Loss of the ephemeral breeding pond number 46, located within the railway cutting adjacent to the A2036;

- Loss of terrestrial habitat associated with populations within ponds 5, 13, 15, 17 and 46; and,

- Fragmentation of GCN population located within ponds 13, 16 and 17.

12.5.84 In order to address these impacts GCN would be translocated under a Natural England licence from pond 46 to three new ponds to be created in fields to the north of Glovers Farm. These ponds would be constructed at least one year in advance of the removal of animals from the vicinity of pond 46. These ponds would be lined with bentonite clay and planted with native species. A GCN translocation would then be undertaken from the area of pond 46. The most efficient way to achieve this would be to encircle the pond with newt proof fencing and associated pitfall traps and to trap animals as they return to the pond in the spring period. This fencing would need to be erected in early March prior to the return of animals to the pond. This fencing would then be supplemented with drift fencing erected within the railway cutting to the south and north of the pond. Trapping would continue for a minimum of 30 days until five nights in suitable weather with no great-crested newt capture had been achieved.

12.5.85 A GCN licence would be obtained for the construction of the Scheme within great-crested newt terrestrial habitat associated with ponds 5, 13, 16 and 17. GCN translocation from the construction area would be carried out either within the spring or autumn periods prior to the commencement of development. This would involve the erection of newt fencing and distribution of associated pitfall traps along the road route where it lies within 500m of a breeding pond. Since the population within the vicinity of these ponds is considered to be small-medium, a minimum of 60 days trapping until five nights in suitable weather with no GCN capture would be required prior to the commencement of the construction works. Thereafter, mitigation within this area would be in line with Paragraph 12.4.94 of the ES.

12.5.86 Additional ponds would be created within the vicinity of ponds 13, 16 and 17 in line with Paragraph 12.4.96 of the ES.

12.5.87 Additional GCN surveys are to be carried out during the 2008 GCN survey season. To date (end of May 2008), GCN have been found in one pond only (pond 13), with surveys complete on the majority of ponds.

Reptiles

12.5.88 Paragraph 12.4.92 of the ES provides a brief statement on the methods to be employed during the reptile translocation works. The grassland and scrub mosaic to be created on the Scheme embankments would provide additional reptile habitat and habitat linkage across the site. This would allow reptiles to disperse widely and would serve to interconnect areas of habitat that currently contain reptiles which are isolated from one another.

12.5.89 Where reptiles are present within habitat that is to be lost or bisected by the Scheme it would be necessary to carry out reptile translocation works. The translocation works would involve the erection of 1000 gauge plastic and post fencing to surround the entire working area. Reptile refugia would be laid within the fenced enclosure and these would be inspected throughout an entire spring or autumn period for reptiles. Reptiles would then be captured and removed from the works area. The area would be declared free of reptiles following five visits in suitable weather conditions with no reptile capture. Fencing would retained undamaged throughout the construction period to prevent recolonisation of the site.

12.5.90 Selection of receptor sites local to the proposed Scheme have been identified so that animals may colonise the road embankments once complete. Suitable areas under consideration include; the grassland along the disused Crowhurst, Sidley and Bexhill Branch railway line, the upper reaches of the Combe Haven Valley and areas of grassland to the east and south of Decoy Farm Pond. All potential receptor would be surveyed to identify existing reptile populations. Receptor sites would need to be protected during the proposed Scheme construction.

12.5.91 Additional surveys for reptiles are currently being undertaken for the 2008 survey season. All reptile work has been carried out in accordance with guidance from Herpetofauna Groups of Britain and Ireland (HGBI).

Further work on the impact of noise disturbance during the construction and operational stages, on bird populations. (Summary* point *19);

And,

Accurate ornithological surveys of the Combe Haven SSSI are required to produce reliable mitigation. (Summary point 24).

12.5.92 Table 12.27 of the ES summarises the impact significance for differing bird species as a result of the Scheme at the construction and operation stage.

Construction Stage

12.5.93 The impact of noise and visual disturbance at the construction stage in the Scheme would be from the operation of large plant and machinery. Impacts are likely to include:

- A break down of territorial behaviour; and,
- Interference with pair-bonding.

12.5.94 This may result in reduced productivity and a reduced density in territories. Therefore, it would be anticipated that the construction of the Scheme would result in reduced territory density the extent of which is related to noise contours. However, mitigation detailed in Chapter 11 Noise and Vibration of the ES would minimise the impact of construction noise on bird populations. A phased construction programme that includes specific working restrictions would be required in order to avoid short-term displacement impacts to over-wintering birds identified within the Coombe Haven SSSI (as identified in paragraph 12.3.130 of the ES).

Operational stage

12.5.95 Recent studies show evidence of reduced densities of breeding birds, particularly species associated with woodland and open habitats, in broad zones adjacent to busy roads. This density reduction is related to a reduced habitat quality, although traffic noise is probably the most critical factor. The impact at the operational stage of the Scheme would be similar to that described above for the construction stage (refer to 12.5.93).

12.5.96 In addition, direct mortality mainly takes place when young birds first meeting traffic. Research carried out in 1997 (Mead *et al* 1997) suggests that larger and more noisy roads are less likely to cause direct mortality to birds than smaller roads. This is possibly related to the width of the road in relation to the territory size of small birds using the hedges. Typical territory radii in good habitat are 30 - 40 metres and roads approaching this width should not cause an adverse impact for small birds. However, there has been no research into threshold levels between the impacts of large roads versus small roads.

12.5.97 Noise impact from the operational stage of the Scheme may also include noise displacement:

- Noise displacement will vary along its route depending on the habitat adjacent to the road and the proximity of this habitat to the road verge;
- Bird populations within close proximity to the road are more likely to be affected; and,

- Impact is most likely to be on small scrub dwelling passerine species and species attracted to the road such as barn owl that may forage alongside the road.

12.5.98 It is likely that the long-term fragmentation of habitats caused by the road acting as a partial barrier to movement would result in a decline of breeding territories and potential population decrease of certain species. Ongoing survey data will be incorporated in a breeding and over-wintering bird mitigation strategy to reduce the impacts of habitat fragmentation.

12.5.99 To date, accurate ornithological surveys have been completed along the route of the proposed Scheme (2006 and 2007 survey seasons). These surveys have informed mitigation. In addition, bird surveys are currently being undertaken for the 2008 season. Breeding bird surveys were undertaken on the 17th April 2008 and 8th May 2008 by an experienced ornithologist. The purpose of the survey was to detect bird diversity and composition of all breeding birds within 100m of the Scheme footprint.

12.5.100 The preliminary findings (May 2008) suggest that the study area contains common and widespread breeding birds indicative of open countryside and urban environments. In addition, a further two surveys are planned for 2008, with the objective of recording all late migrant species. These surveys will include a single evening survey to record crepuscular and nocturnal birds. Results of these surveys will be available in September 2008 within a Survey Update Report to be issued to NE and the EA, which will give full details of all ongoing surveys for all species.

Mitigation for Coombe Haven SSSI

12.5.101 The winter bird survey undertaken in 2006 followed standard British Trust for Ornithology (BTO) methods. The survey was based on a transect method. All transects followed the route of the Scheme with all species within 200m of the transect identified.

12.5.102 Countryside Park Transect Sectors 1, 2, 3 and 4 encompassed the northern edge of Combe Haven SSSI. Results from this survey, and transect locations, are shown in Appendix I.5 of this Addendum to the ES.

12.5.103 Significant noise, visual and vibration impacts on Coombe Haven SSSI boundary bird populations are likely to occur during the construction phase of the Scheme. Loss of vegetation communities outside the Coombe Haven area is likely to result in visual and noise disturbance to those species that inhabit the boundary areas of Coombe Haven SSSI. At its closest the location the centreline of the Scheme carriageway would be located approximately 50m to the north of the SSSI boundary.

12.5.104 In order to reduce the construction impacts from noise Section 11.4.27 of this addendum details the mitigation measure to be put in place .The Design and Access statement Figures 13.22.A to 13.22B presents the noise level contours of the operation Scheme. None of the contours for LAeq50dB limits would directly impact

on Coombe Haven SSSI, with the exception of very minor incursion in the Adam's Farm area.

12.5.105 During the operational stage of the Scheme, the completed route alignment would be largely in cutting to the north of Coombe Haven. The combination of cutting and landscape planting as detailed in the Design and Access Statement Addendum Zone of Visual Influence (ZVI) maps Figures 13.15 B and 13.15 E (which represent the ZVI for the 2015 Scheme year for 2m and 5m vehicles), would significantly reduce the operational visual impact of the Scheme on Coombe Haven SSSI bird populations. Filsham reedbed - a key habitat, and the largest reedbed in Sussex - would be located over 1km from the Scheme and therefore would not be impacted by construction or operational visual disturbances.

12.5.106 Mitigation in respect of the bird populations in Coombe Haven SSSI would be achieved by ecologically sensitive timing of construction works in accordance with mitigation measure to be set out in the CEMP. The CEMP should include a breeding and over-wintering bird mitigation strategy. The strategy would incorporate analysis of bird point data and ongoing survey data in order to develop appropriate migration measure for individual species. The details of the appropriate timing of work construction stages (specifically, the programme for the cutting works), would need careful phasing to avoid impacts to over-wintering birds.

12.5.107 There would be no direct habitat loss of the Coombe Haven SSSI as a result of the Scheme. As part of mitigation enhancement 229596m^2 of marsh, wet grassland, reedbeds and open water areas would be provided in compensation for the loss of 102654m^2. This additional habitat totals to 24288m^2 over and above the agreed two for one habitat mitigation.

Greater detail on management and monitoring of habitats, particularly mitigation/compensation habitats, is needed. (Summary point 25).

12.5.108 Section 9.0 of the BHLR Design and Access Statement and associated Addendum details the HA's commitment to the management of new and existing habitats to mitigate and compensate for the effects of the proposed Scheme. The detailed management of new and existing habitats associated with the Scheme would be provided in the form of a comprehensive long-term landscape and wildlife management plan that would initially cover a period of 20 years after Scheme completion.

12.5.109 A seven year management programme should be included to address the habitat establishment period and a longer term habitat management strategy that outlines the subsequent 13 year management of the site. The full details of the management plan would be determined following a period of monitoring, site assessment and review. The management plan would be subject to agreement with ESCC as the Determining Authority, NE, SWT, ESCC's Ecologist, Royal Society for the Protection of Birds (RSPB) and Sussex Ornithological Society.

12.5.110 In brief, the suggested management for new and existing habitats would be as follows. Scrub planting would be managed on a ten to fifteen year rotation of cutting, so as to prevent species succession and therefore maintain the targeted biodiversity value of this habitat. Once grassland habitats have established, they would be managed with an annual cut or biannual cut, in the spring and autumn. Arisings from the cut would be piled to provide refugia for small mammals, birds and reptiles. At suitable distances from the proposed Scheme alignment, grassland areas would be managed through grazing practices. Wet grassland would be grazed over summer periods and dry grasslands over winter. For riparian grassland, grazing practices may suffice, although it could be necessary to introduce a cutting programme for reedbeds. This would be determined following habitat monitoring, to assess the rate of growth and spread of the reeds.

12.5.111 Monitoring of the site would include the monitoring of mitigation/compensation habitats and of existing habitats to be retained. In the case of the former, the monitoring would determine the success of the mitigation and compensation strategy and the results utilised to fine tune habitat management. In the case of the latter, monitoring would be aimed at establishing whether there is a change in existing communities. This would require that a detailed baseline survey is carried out so as to determine the existing conditions. Such baseline monitoring may best be carried out by identifying 'keystone' species and monitoring their distribution and population sizes. The monitoring would also consider all protected and BAP species.

12.5.112 To secure funding for the management and monitoring of habitats there are areas within the Scheme which could use some degree of agricultural land resources as a means of meeting the wildlife management requirements. It would be the intention of the Highway Authority to retain ownership of all of this land and charge a rent for its agricultural use. This income would then be "ring fenced" for wildlife and landscape management of those areas which cannot be managed through agricultural uses. It would be the Highway Authority's intention to maximise income from land or property in its ownership, where this is compatible with the objectives of the Scheme or mitigation measures.

Detailed ecological survey information on all parts of Marline Valley Woods SSSI that are within 100 metres of the development boundary. A detailed assessment of the impact of shading resulting from the construction of the road, or any other part of the development proposal, on the species and habitats present within the SSSI. (Summary point 26).

12.5.113 Detailed vegetation surveys of the immediate route corridor were carried out in 2006. In addition, a detailed ecological survey of Marline Woods SSSI was carried out by Simon Davey in November 2006. This was with particular attention to lower plant communities. The full report can be viewed in Appendix I.4 of this Addendum to the ES.

12.5.114 The impact from shading as a result of the road for Marline Woods SSSI is likely to be negligible.

12.5.115 Figure 12.2 of Appendix I.2 identifies the extent of shading on Marline Woods SSSI at the summer equinox and winter equinox at the location of the proposed bridge over the London to Hastings Railway. The extents are determined according to following formula:

$$Shadow\ Length = \frac{Bridge\ Height}{Tan\ (Altitude)}$$

12.5.116 The altitude of the sun at the winter equinox and at the summer equinox has been calculated as 16.052 degrees and 62.944 degrees respectively using the formula:

$$Sin\ (Altitude) = Sin(Dec) * Sin(Latitude) + Cos\ (Latitude) * Cos(Dec) * Cos(AV * T)$$

where*:*

Dec = the suns declination for that day/month.

AV=Angular Velocity of the earth's rotation

T= +/- Time displacement from solar noon.

12.5.117 Therefore, for the centre point of the bridge at a height of 10.5m the extents of shadow are known to be:

- 10.5 / Tan (16.952) = 36.49m (winter); and
- 10.5 / Tan (62.944) = 5.36 (summer)

12.5.118 The only location where shading is likely to cause a significant impact as a result of shading is directly under the proposed bridge over the London to Hastings Railway, which passes over a small area of the western boundary of the SSSI. A proportion of boundary bramble scrub along the edge of the SSSI adjacent to the railway is to be lost to the construction of the bridge. The proposed bridge would be built to a height of approximately 8m to the west of the railway line, and in the order of 13m (maximum) to the east. This height means that the maximum effect of annual oblique shading, at the centre point of the bridge (10.5m) on the retained bramble margins areas of the SSSI would be 5m. The Winter equinox shading impact would reach a maximum of 37m reducing during the Summer equinox to 5m.

12.5.119 Baseline vegetation surveys identified the wood margins to be affected as comprising of W24 Bramble and Yorkshire fog *Rubus fruticosus-Holcus lanatus* underscrub. This NVC community is described by Rodwell (1991) as a very typical community of abandoned and neglected ground. Its marginal location within the

SSSI can be described as a static component of the established woodland margins (Rodwell 1991). W24 structure in this locality is generally of dense, low bramble scrub with few herb species and no canopy trees. The main woodland canopy along the eastern edge of Marline woods is comprised of W10 Oak, bracken, bramble *Quercus robur,Pteridium aquilinum, Rubus fruticosus* woodland.

12.5.120 The existing surrounding woodland canopy has a partial shading impact on the shrub and field layers. Further dense marginal scrub increases the shade impact along the woodland edge. The bridge would have a full shading impact within 5m of the bridge that is likely to impact only on the woodland edge bramble scrub vegetation. The constant 5m shaded zone is likely to result in changes to the microclimate. Impacts of microclimate alteration may result in a shift of species distribution and abundance. It is likely that community changes would potentially result in over-dominance of invasive and shade tolerant species. The area to be directly impacted by the 5m shading impact supports W24 bramble scrub vegetation. Less than 0.1% of Marline Wood SSSI would be exposed to shading impacts of the bridge.

12.5.121 A marginal zone of woodland edge bramble scrub would be retained so that the existing woodland edge structure is maintained. Where vegetation clearance is required for the construction of the Scheme and under the proposed bridge, but outside of the SSSI, planting should include shade tolerant species such as hazel, holly, hawthorn, ground ivy, honeysuckle, bluebells, wood anemone, honeysuckle and ferns. Areas in full shade directly beneath the bridge are likely to experience unsuitable microclimate and soil conditions for colonisation by species able to tolerate a full shade environment only would be viable.

12.6 IEMA Comments

An indication of the purpose and methods of consultation with all groups listed would also be helpful.

12.6.1 Section 12.2.30 of the ES states that EN and the SWT were consulted at meetings in 2005, with the purpose of discussing the scope of surveys. Please refer to Appendix I.3 for records of these consultations. Face to face meetings have subsequently been held between ESCC (as project promoters), and associates, EN and the EA. The purpose of these meetings was to clarify the wildlife mitigation measures which the SEBs and Planning Authority would expect to see on the planning application for the Scheme.

12.6.2 Records of the following meetings are presented in Appendix I.3:

- Wildlife Issues meeting held 5th May 2005, between SWT, NE, ACTA Consultants and ESCC as project promoter.

- Wildlife mitigation/ compensation meeting held 12th June 2006 at County Hall, Lewes between EN, EA, ESCC's County Ecologist, ACTA Consultants, ESCC as project promoter and Faber Maunsell Consultants.

- Wildlife Issues meeting held 9th February 2007 between ESCC as the Determining Authority, ESCC's County Ecologist, ACTA Consultants and ESCC as project promoter.

  In addition, records of a meeting held on Monday 10th March 2008 at County Hall, Lewes, between Natural England in their capacity as Planning Consultee, and ESCC and associates as the Project Design Team, to discuss the ES Chapter of Nature Conservation, with a particular focus on Dormouse issues are presented in Appendix B.1 of this Addendum to the ES. Records of the supplementary meetings between ESCC, MM and NE and the EA on 22nd July 2008 are also contained in Appendix B.1.

12.6.3 The Sussex Ornithological Society (SOS), the Hastings Badger Group (HBG) and the British Deer Society (BDS) have also been contacted. The BDG were contacted in reference to there being a Road Safety Issue from deer. They had no information for the area and so no further consultation was carried out. HBG did not respond to the consultation approach.

The use of the term significance in Table 12.14 is confusing as it appears to actually relate to the importance of the resource rather than the significance of an effect to it.

12.6.4 Table 12.14 of Chapter 12 of the ES summarises the valued biodiversity resources (VBRs) that could potentially be affected by the Scheme. The table does not refer to significant effects. The word significance should be replaced with "Level of Value", and the table should be cross referenced to Table 12.1 of the ES. Table 12.1 describes the criteria for valuing a resource as international, national, regional, county, district or local value. VBRs are resources which have a value of local level or above.

12.6.5 The significance of an impact is determined according to Table 12.3 of the ES.

The basis for evaluating the importance of Red Data Book bird species as being of local value should be clarified.

12.6.6 This assessment was made as the populations of such species are generally small and not of National significance at the 1% population threshold level. Therefore, populations are considered to be of local significance only.

The location and current nature conservation value of the areas to be used as replacement habitat must be identified.

12.6.7 This survey work is to be carried out during 2008 and a report will be produced which identifies the ecological value of this land and any constraints with regard to protected species. To date, the survey work has informed the location of suitable replacement habitat sites for reptiles. Four potential reptile receptor sites have been identified, one in the urban section and three in the rural section. All rural receptor sites are within CPO land to ensure their long term habitat viability as reptile receptor sites. The urban site is Bexhill Down, which is a site where Bexhill Council are currently translocating reptiles from a nearby school grounds due to expansion work. The rural sites are located north of Acton's farm, which is currently grazed by cattle, and south of Adam's farm either side of the disused railway embankment. This area is currently arable. Additional survey work is ongoing in 2008 on all potential receptor sites to ensure that they have capacity to accommodate reptiles. The rural areas are identified as providing species rich neutral grassland. Management recommendations would be made to further enhance their suitability for reptiles, such as the creation of hibernacula.

A clearer commitment to the provision of bat roosts would be helpful to ensure that they form part of the plans for the Scheme.

12.6.8 Details of the proposed bat mitigation are provided in Section 12.5.49 – 12.5.59 above.

A range of commitments are included in the ES to improve habitat management of existing habitats and the creation and management of replacement habitat. Appendix 12-J provides a summary of management requirements. However, to demonstrate greater commitment to the implementation of the management requires a clearer indication of the resources to be allocated to the management measures and the time period to which the commitment applies. Safeguards against the future withdrawal of the resources should also be outlined.

12.6.9 Section 9.0 of the BHLR Design and Access Statement and associated Addendum details the HA's commitment to the management of the area of land required to mitigate and compensate for the effects of the proposed Scheme clear. A proposed management plan would set out details of management measures. Chapter 13, Section 13.5.32 of this Addendum to the ES gives additional information about the resources to be allocated for management measures. The time period to which the commitment would apply is 7 years.

12.7 Conclusions

12.7.1 The Regulation 19 and IEMA issues raised and discussed above cover a wide range of additional information to support the findings of Chapter 12 Nature Conservation and Biodiversity of the ES.

12.7.2 The key issues discussed have shown that the proposed Scheme extends over the Marline Wood SSSI and that less than 30m² of the SSSI would be overshadowed by the proposed railway bridge structure. The railway bridge may result in

fragmentation of the woodland corridor extending along the railway line. However, the effects of fragmentation can be compensated for by planting on the lead-up to and planting beneath the proposed bridge structure.

12.7.3 In terms of fragmentation of the Combe Haven Valley it has been shown that the fragments of grazing marsh to the north of the proposed Scheme would be isolated from the larger body of the valley to the south of the road. Linkage of habitats would be provided beneath bridges to maintain connectivity, although it is possible that less mobile species may be unable to cross the proposed road. Linear habitat linkage would be created along the length of the Scheme, and this would be in the form of scrub planting and grassland providing corridors for small mammals (including dormouse), birds and reptiles.

12.7.4 The Scheme would cause an increase in nitrogen deposition within Combe Haven SSSI and Marline Valley Woods SSSI in 2010, including those habitats where exceedences of the critical loads are already occurring. The proposals are not predicted to cause new exceedences of the critical loads at any location or any habitat type. All identified exceedences are predicted to occur with or without the proposed Scheme. Therefore, it would be anticipated that plant communities will succeed towards communities where nutrient demanding species dominate the communities present. Such succession may be currently occurring or already have occurred within the Scheme location.

12.7.5 The impacts of salt are considered to be insignificant. Salt and other leachates would not have a negative impact on the trout and lamprey nurseries in the Powdermill Stream.

12.7.6 Bat roosts within a barn located at Adam's Farm would be lost. This is a low status roost and would be compensated for through the provision of boxes and roosting units along the route of the Scheme. There would be no increase in lighting through the open countryside area between Queensway and Bexhill. The linear habitat to be planted alongside the link road would, when mature, provide additional habitat linkage for bats across the site.

12.7.7 Populations of dormouse to the south and north of the Scheme would be segregated by the Scheme. However, each population is considered to be sufficiently large to be self maintaining due to the extent of existing suitable habitat present. Furthermore, it is considered that dormice are able to cross roads of 12m or less. Crossing points along the urban section of the road would be planted, which would reduce the width across the verge to 10.3m. Dormouse underpasses would be provided beneath all bridges and the east to west habitat linkage would be improved through planting of scrub along the road embankments.

12.7.8 Great-crested newt mitigation at the site would include the translocation of animals and the construction of new ponds under a Natural England licence. Similarly, reptiles would be translocated from the works area and additional habitat would be created along the embankment of the Scheme.

12.7.9 Additional bird, great-crested newt, dormouse and bat surveys are to be carried out during 2008 to provide sufficient information for Natural England licensing purposes. Breeding bird surveys are ongoing through 2008. The results of these surveys will inform the strategy to be developed to address potential noise and visual impacts on Combe Haven SSSI as result of the Scheme.

12.7.10 Section 9.0 of the BHLR Design and Access Statement and associated Addendum details the HA's commitment to the management of new and existing habitats to mitigate and compensate for the effects of the proposed Scheme. This would be provided in the form of a comprehensive long-term landscape and wildlife management plan for a period of twenty years after Scheme completion.

13 Landscape and Visual Effect

13.1 Introduction

13.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 13 Landscape and Visual Effects of the ES for the Scheme.

13.1.2 The Chapter should be read in conjunction with the Addendum Design and Access Statement. Cross references will be made but as some of the requests were for more detailed design work to be submitted, this has been addressed through the vehicle of the Design and Access Statement. Most of the information which is provided throughout this chapter and the Addendum Design and Access Statement simply adds detail to the information previously submitted and does not materially change the application or the assessment of the proposals. Where changes are made, these have been indicated.

13.2 Regulation 19 Issues – summary

13.2.1 The Regulation 19 issues raised by ESCC following consultation on the ES in relation to Landscape and Visual Effects are summarised below:

Landscape and Visual

- Fuller information is required on the design appearance of the Scheme at the Bexhill end including information about tree loss and working clearances in the former railway cutting. This should include detailed cross sections and new photomontages. Far greater certainty over what can / will be achieved in the proposed footprint needs to be given;
- Provide ZVI on the base engineering of the road to demonstrate the effectiveness of the bunding and clarify points raised in detailed comments;
- Provide detailed information on the contouring interface with noise fencing at bridges;
- Provide justification for two bridges in Powdermill Valley;
- Avoid engineered landform to parts of The Greenway and equestrian routes and confirm generally how the landscape earthworks are to achieve appropriately graded landforms;
- Provide justification for remoteness map having regard to apparent conflict with ZVI;
- Provide correction or justification / clarification to points of apparent inconsistency in methodology set out in detailed comments (as contained in Appendix A.1 Regulation 19 Letters);

- Correct errors in visual impact mapping and suggest representation in a clearer format;
- Clarify vegetation loss mapping;
- Clarify location and proposed design of noise fencing;
- Provide fuller fencing details together with, it is hoped, a rationalisation of the fencing;
- Clearly demonstrate where the 50 dB(A)contour will be relative to The Greenway;
- Provide full details of how the landscape management of the proposals is to be implemented, presumably linked to the ecological management proposals and a statement on the lifespan of the management works and ring fenced funding; and,
- Clarify historic landscape values and how much they will changed.

Townscape

- 1:500 drawings are required at 'key points' in order to be able to assess the likely environmental impact at particular locations, for example: -
    - The new Ninfield Road Overbridge at Sidley.
    - The new Woodsgate Park Overbridge.
    - The new London Road Junction.
    - The setting of the Chapel Path Underpass.
    - The Belle Hill Junction at the southern end of the Scheme.
    - The Queensway Junction at the northern end of the Scheme.
- As a detailed planning application, "typical structures" that are 'not to scale' is not acceptable. More detailed drawings are required.
- In order to assess the environmental impact of the new Scheme being elevated above the height of the existing "Chapel Path", (the pedestrian route to the adjacent schools) more specific information in plan form and section illustrating the extent and potential impact of elevating this section of the new road is required.
- The two photomontages illustrated on Figure 13.16, entitled "Photomontage 24 – Urban Viewpoint 016" are incorrect and misleading as any trees would have to be planted behind, rather than in front of the new fence. New photomontages should be prepared by the applicant.
- Figure 13.16.11, entitled "Photomontage 26 – Urban Viewpoint 020" is also incorrect and misleading as it claims to illustrate how London Road would look when the new road has been built and in 15 years time, but fails to show: -

- The new Scheme, as opposed to the retained London Road;
- The elevated section of the new Scheme that would be required to enable the "Chapel Path Underpass" to be constructed at the point where the existing houses are shown demolished;
- Any details of the junction with Belle Hill, (and associated clutter), in the distance; and,
- Any details of the new junction with the Scheme, (which would have been to the right of the view illustrated).

- New photomontages should be prepared by the applicant.

13.3 IEMA review – summary

13.3.1 The ES was reviewed by IEMA as an independent, external organisation. The issues raised following this review with regards to Chapter 13 Landscape and Visual Effects of the ES are summarised as follows:

- Table 13.5. The explanations of the each of the classifications for sensitivity should provide a clearer indication of the factors that contribute to the sensitivity of the landscape; and,

- The evaluation of the sensitivity of the landscape generally shows some consistency between the evaluation of the quality and value of the landscape and the sensitivity. An exception is the South Slopes of High Weald which is stated to be of high quality and value, but is considered to be moderately sensitive to change (Table 13.11). A justification for this apparent inconsistency would be helpful.

13.4 Consultation

13.4.1 Consultations have been held with the Planning Authority and its statutory consultees so as to clarify their requirements. Please refer to Appendix B for minutes of the Monday 26th November, 2007 meeting, held between the Planning Authority, Planning Consultees and the Project Design and Landscape Team.

13.5 Regulation 19 issues -

Fuller information is required on the design appearance of the Scheme at the Bexhill end including information about tree loss and working clearances in the former railway cutting, etc. This should include detailed cross sections and new photomontages. Far greater certainty over what can / will be achieved in the proposed footprint needs to be given.

13.5.1 The objective of the Highway Authority is to develop a Scheme with the local community, which helps meet some local needs. That consultation has not been carried out at this stage, so the final form of the community open space in this area is still to be resolved. However, at the request of the Planning Authority, a more

detailed indicative scheme has been prepared for this location. This Scheme is shown in the Addendum Design and Access Statement (ESCC, 2008; drawing 208/31/11/1, reproduced in Appendix J.3 of this Addendum as Figures 13.1a and 13.1b). It shows the creation of special features, in this case brick mazes set in grass and paving, shelter and seating for children waiting for transport from school. The detailed design of this area would be guided by the following principles:-

- Seek to identify open space services which the local community would wish to incorporate into the area and design within those requirements;
- Provide a landscape buffer between the proposed road and the houses in London Road;
- Maximise the opportunities for the provision of green space;
- Accept the limitations of developing open space over underground flood water storage tanks;
- Seek to calm traffic in the area and create an environment in which there are surfaces shared by people and vehicles;
- Provide for some car parking for residents of London Road south;
- Recognise the needs for drop off areas for schools on the other side of the proposed Scheme;
- Provide a general upgrading of the townscape and local environment for this area; and,
- Minimise the effects upon the site containing the schools to the west of the proposed Scheme.

13.5.2 Tree losses as a result of the Scheme are fully identified in the Volume 3 part 2, Chapter 13 of the ES. However, to clarify this, minor revisions have been made to Figures 13.17 A – R. Please refer to Appendix J.3 of this Addendum to the ES. The loss recognises the working areas required to construct the works. Losses are indicated in red outline on the drawings, and those to be retained in green. There would be some need for tree surgery and coppicing on retained trees to enable them to better cope with changed circumstances as a result of the construction of the Scheme. Such detail would be resolved at a later stage and on site.

13.5.3 Paragraph 3A.3.47 of the ES indicates that the construction methods for the retaining walls in the former railway cutting would be designed to minimise disturbance to existing trees, earthworks, noise and vibration. It is likely that they would be constructed in bored piles or steel sheet piles, if it could be confirmed that they would not need to be driven. This would avoid the need to cut into the bank to provide construction width and minimise tree loss. The walls would then be clad and detailed as agreed with the Planning Authority. This information has been taken into account in Figures 13.17 A – R in the ES and the revisions to these figures are to assist with resolving concerns about their accuracy. Therefore, the endeavour would

be to retain as many of the existing trees as possible, although there may be circumstances where trees may be lost.

13.5.4 Cross sections are shown in the submission but the detailed design cross section of the wall construction is not possible at this stage. The design and construction method for the walls would ensure that the maximum number of trees would be retained and that the figures 13.17 A – R revision 1 are a realistic representation of tree loss and conservation.

13.5.5 The Photomontages have been reviewed and are considered to give a reasonable representation of the Scheme as submitted in the application. The illustrative design in the Addendum Design and Access Statement (ESCC, 2008), shows the location of proposed tree planting in relation to noise fencing and other features. This, together with the details of tree loss and retention and the planting plans, shows what would realistically be achieved.

Provide ZVI on the base engineering of the road to demonstrate the effectiveness of the bunding and clarify points raised in detailed comments.

13.5.6 There is no necessity for such a Zone of Visual Influence to be produced or considered by the Planning Authority as there is no intention of the Highway Authority to construct the scheme using only the “base engineering”.

13.5.7 However, given the request from the Planning Authority, this exercise has been undertaken and included here so as to assist in understanding how the Scheme has been developed. The Design and Access Statement makes it clear that the primary purpose of the mounding is for noise attenuation in the rural areas, in preference to extensive noise fencing. Reduction of visual impact is an important but secondary benefit.

13.5.8 The revised ZVIs, Figures 13.15A (Rev 1) and 13.15B (Rev 1), indicate the visual influence which a vehicle of 5m in height would have on the surroundings when using the proposed road. ZVI 13.15C indicates the effects of the top of a 5m vehicle with just the “base engineering” in place, i.e. with none of the mounding in place but including the cuttings. Given that this represents the effects of the top of a tall vehicle, the change may not be as great as might be expected at the year of opening. A further series of ZVIs have therefore been run, based upon the effects of a 2m high vehicle, which represents the larger proportion of road users. Figure 13.15D shows the influence of a 2m vehicle at the year of opening with the environmental scheme in place. Similarly, Figure 13.15E shows the same at the design year, 15 years on. Figure 13.15F indicates the influence of a 2m high vehicle with only the “base engineering” and no mounding but including the cuttings. It then becomes clear that the introduction of the mounding brings a major reduction of visual influence of a 2m vehicle upon the surrounding landscape.

13.5.9 All Figures can be found in Appendix J.3 of this Addendum to the ES.

Provide detailed information on the contouring interface with noise fencing at bridges.

13.5.10 The Addendum Design and Access Statement provides additional illustrations of the proposed structures and their relationship with landform. No changes are proposed to the Scheme but some additional detailed information is provided. The intention is to create a noise barrier which would be as continuous as possible. Where noise fences would have to be used instead of bunds, in the rural areas, their height would be continued so as to emulate similar height noise bunding near by. In this way, no gaps would be left in the noise barrier between the road and the adjacent countryside, and the maximum effect could be achieved.

Provide justification for two bridges in Powdermill Valley.

13.5.11 This issue is covered in Chapter 9, Water Quality and Drainage of the ES at 9.5.30 and 9.5.31. The bridge over the statutory Powdermill Stream is required to accommodate flows in the stream , and would also accommodate the 1066 Country Walk. At time of flood, the Powdermill Stream overtops the banks to flood the valley. The flow from the valley is relieved by the original course of the Powdermill Stream, which is normally a small water course in the valley floor. From here, water flows into the Combe Haven , through pipe work beneath the Watermill Stream, to a level which is normally lower than the Powdermill Stream. A free span structure is also required at this stream crossing, in order to accommodate flood flows, which are much greater than the normal flow. This avoids any build up of flood water upstream of the proposed Scheme. The valley of the Powdermill Stream is at a lower normal water level than that of the Powdermill Stream itself. Therefore, it is not possible to take all the flood water through one water course. The flows are too great, and the wildlife requirement such, that reducing the size of either of the bridges would not be appropriate.

Avoid engineered landform to parts of the greenway and equestrian routes and confirm generally how the landscape earthworks are to achieve appropriately graded landforms.

13.5.12 The new landforms have been designed to accommodate all features in as natural a way as possible. The Addendum Design and Access Statement, illustrates contours which interpret the bank and cutting symbols on the application plans to meet this objective. The indication of distinct banks, on the application plans, was a function of the design computer software used in the engineering design. The drawings, in the Addendum Design and Access Statement, illustrate how those banks would be interpreted in the landscape to produce an appearance of natural landform of which the Greenway routes are a part.

Provide justification for remoteness map having regard to apparent conflict with ZVI.

13.5.13 Figure 13.19 in Appendix J.3 of this Addendum to the ES indicates loss of both remoteness and exceptional remoteness along the route of the proposed Scheme.

13.5.14 Areas of exceptional remoteness to the north of the proposed Scheme are distinctly divorced from the area affected by the proposed Scheme and so will retain their status of exceptional remoteness.

13.5.15 Existing areas of exceptionally remote landscape to the south of the proposed Scheme alignment would be affected by an increase in noise and limited views of tall vehicles to such an extent that its exceptional remoteness cannot be guaranteed and so has been deleted from the map.

13.5.16 It is clear from the remoteness mapping carried out, both by the County Council and CPRE, that the existence of visible roads is not a reason to deny an area the status of remoteness. It is therefore considered that for areas, both to the north and south, of the proposed Scheme, the limited views of tall vehicles from particular locations was not enough reason on its own to remove the experience of remoteness in this landscape. Figure 13.19 indicates loss of both remoteness and exceptional remoteness along the route of the proposed Scheme.

Provide correction or justification / clarification to points of apparent inconsistency in methodology set out in detailed comments.

13.5.17 Please refer to Tables 13.6 and 13.7 in the ES. There is a typing error in both of these tables which gives the appearance of two sets of comments under Moderate Beneficial (positive). Both sections should read as one. Please refer to Appendix J.1 for reproductions of these tables as table 13.1 and 13.2. There is no effect of this typing error upon the assessments within the ES.

13.5.18 Whilst it is accepted that there may be some differences between various sets of guidance and the methodology used in the assessment represented in Table 13.6 of the ES (Table 13.1 in this Addendum), it is considered that the comments, upon which judgements are based, are clear.

13.5.19 Figure 13.21 of the ES summarises the visual effects from the traffic figures, which are contained within Chapter 6 Travel and Transport of the ES. This is the reason that they are shown as boxes. Appendix 13-E and Table 13.19 of the ES contain more detailed information about the visual effects upon sections of road and properties along them. The “scoring” for these effects is more detailed than summarised in Figure 13.21. Paragraph 13.2.32 explains the approach taken over the effects upon the landscape, stating that:

“An assessment has been made of potential secondary effects of the Scheme on surrounding areas, specifically increase or reduction in traffic on urban and rural roads and the resulting effects on the surrounding landscape and townscape. This will include the surrounding countryside, villages and the urban areas of Hastings and Battle “.

13.5.20 The assessment is shown in Table 13.17 Study Area 2 Operational Landscape and Townscape Impacts on page 13-96 of the ES.

13.5.21 In Table 13.8 of the ES, the approach has been taken from the guidance which is available in GLVIA and DMRB Volume 11, Section 3 Part 5, relating to the significance of residential receptors. The assessment seeks to draw out the benefits and adverse visual impacts of changes in traffic volumes upon properties. This is separate from the assessment of visual impact from the building of the road.

13.5.22 Table 13.9 of the ES does indicate the level of impact which is expected from certain levels of traffic reduction. Reference has been made to Appendix 13 - E entries 6 and 7 and the scoring of these properties and added comments. In these situations the actual score is "slight beneficial". However, because these areas are within the AONB the assessor has taken the view that "slight" scores are significant and the comment reflects this.

Correct errors in visual impact mapping and suggest representation in a clearer format.

13.5.23 Modifications have been made to the mapping, to assist with clarity of understanding. The ZVIs have been revised at Figures 13.15A Rev 1 and 13.15B Rev 1 in Appendix J.3 of this addendum. Figure 13.15A Rev 1 shows the ZVI of the Scheme with no planting in place. Figure 13.15B Rev 1 shows the ZVI at 15 years from opening but using an average height for the new planting (7.3m) rather than a maximum projected height (8m). These ZVIs are of the top of a 5m high vehicle on the proposed Scheme. They incorporate the screening afforded by existing vegetation in the area as well as proposed earthworks and planting. The ZVIs show approximately what length of road would be visually apparent, from locations around the Scheme, when a 5m high vehicle passes along it.

13.5.24 The 15 year ZVI takes into account the average height which new planting would be expected to achieve. The Scheme does offer off-site planting to house owners to help further reduce the visual effects of the proposed road upon homes. However, no reliance is placed upon any such planting for that purpose or for any considerations within the ES and no benefits are relied upon within the Assessment.

13.5.25 The planting belts incorporated within the Scheme are a minimum of 10m in width and most incorporate a thick woodland edge. This follows the minimum width recommended by DMRB, HA 56/92, New Roads Planting, Vegetation and Soils, Screening with Vegetation, Section 2.2. This section also suggests that a shrub screen needs to be 5m wide. The proposals for the Scheme planting would incorporate both types of planting, for screening and wildlife conservation. It also highlights that whilst vegetation does not reduce noise levels, it can reduce the perception of noise.

13.5.26 Revisions have been made to the visual mapping in Figures 13.11 A – D (rev 1), 13.12 A – D, 13.13 A – D and 13.14 A-D. Please refer to Appendix J.3 of this Addendum to the ES for these revisions.

13.5.27 These minor changes have no effect upon the findings of the relevant assessment in the ES.

Clarify vegetation loss mapping.

13.5.28 Impact upon Existing Vegetation mapping, Figures 13.17 A – R, have been revised to assist in clarity of understanding. The Appendix 13-H of the ES, which sets out Impact upon Vegetation Features within the Overall Scheme Footprint, has been slightly modified. The modified Impact on Vegetation Features within the Overall Scheme Footprint table can be found at Appendix J.2 to this addendum. The modifications are primarily to the graphics in order to avoid an impression of double counting. The reference numbering has also been modified to avoid any impression that works would be taking place outside of the planning application area. This change has no effect upon the relevant assessment in the ES.

Clarify location and proposed design of noise fencing.

13.5.29 Noise fence locations are shown on the Environmental Design drawings in the application documents (Drawings 204/31/11 to 14). Fences would be 1.8m high in urban areas and would be up to 2m high where they are needed in rural areas. The design of fences would be specified to suit their location. Where fences are embedded in vegetation, i.e. in much of the urban area, it is currently planned to use "Greenscreen" type fencing over which natural climbing vegetation can grow. In other situations, such as adjacent to the Bexhill High School site, a more conventional heavy duty timber fence would be deployed. All fencing is intended to have absorptive characteristics.

Provide fuller fencing details together with, it is hoped, a rationalisation of the fencing.

13.5.30 The proposed locations for fencing are shown on the Environmental Design drawings within the Planning Application (Drawings 208/31/11 to 14) and Additional Habitat Continuity Plans within the Addendum Design and Access Statement (Drawings 208/31/32/A to I; these are reproduced within Appendix J.3 of this Addendum as Figures 13.23 A to K). The exact details of fencing in the rural areas would be determined at a later stage when more detailed discussions can be held with farmers and those managing the land. In principle, the Greenway would be fenced from farm land but not necessarily from other land. It is anticipated that the detailed location and design of fencing would be the subject of a planning condition. Fencing is seen as one of the tools available to ensure long term management of the application area. The design and layout of the fencing would be guided by design principles which would include:-

- Full account of the needs of wildlife management;

- Consideration of the needs of the farmers and other land managers adjacent to the Scheme and those engaged in managing the application area for wildlife;

- Minimisation of the amount of fencing needed to achieve wildlife and land management objectives;

- Minimising the effects of fencing upon the landscape and visual amenity;

- Modification of management methods to minimise fencing (e.g. there may be a demand in the area for multiple small grazing plots for horses and small holdings but this form of land management would not be in the interest of the landscape and visual amenity and so would not be permitted); and,

- Adoption of fencing designs which are common to the locality. Fencing in the rural area is intended to be agricultural in character.

Clearly demonstrate where the 50 dB(A)contour will be relative to the Greenway etc.

13.5.31 The 50dB LAeq noise contour has been plotted over the environmental design base, both for the year of opening and the design year. Figures 13.22A-C (Scheme Noise Contour Levels) in Appendix J.3 show these contour plots. It can be seen that a significant length of the Greenway would be outside of the 50dB contour, although it would be inevitable that certain sections parts would be close to the Scheme.

Provide full details of how the landscape management of the proposals is to be implemented, presumably linked to the ecological management proposals and a statement on the lifespan of the management works and ring fenced funding.

13.5.32 Section 9.0 of the Design and Access Statement makes the Highway Authority's commitment to the management of the significant area of land required to mitigate and compensate for the effects of the proposed Scheme clear. The proposed Management Plan would set out details of management measures. As the design of the management of land has been progressing, it is clear that there are areas within the Scheme which could use some degree of agricultural land resources as a means of meeting the wildlife management requirements. It would be the intention of the Highway Authority to retain ownership of all of this land and charge a rent for its agricultural use. This income would then be "ring fenced" for wildlife and landscape management of those areas which cannot be managed through agricultural uses. It would be the Highway Authority's intention to maximise income from land or property in its ownership, where this is compatible with the objectives of the Scheme or mitigation measures. This would ensure that the Authority has resources to manage the land for wildlife and landscape as intended after the completion of the 7 year contract maintenance or after care period.

Clarify historic landscape values and how much they will be changed.

13.5.33 The Historic Landscape is discussed in Chapter 14 Cultural Heritage of the ES. The methodology used in the assessment is outlined in Section 14.2 of the ES. For the results of the assessment please refer to Section 14.3.63.

13.5.34 No program of Historic Landscape Characterisation has been applied to the Scheme nor was there any evolving text or study available. However, the published County Landscape Assessment (ESCC 2004) divides the county into a series of fairly broad landscape zones based on their visual landscape qualities. The Scheme lies within Area 10 which was referred to as "*Darwell Valley and Combe Haven Valley in the High Weal"*. The key characteristics of the Combe Haven Basin are described as:

- *"Focal open, flat winding valley floor with wetland;*
- *Intricate terrain of small, winding valleys and ridges around levels with abundant woods and ghylls. Extensive areas of ancient woodland.*
- *Contrast between open valley floor and slopes."*

13.5.35 In addition, the Scheme has been divided into ten zones, reflecting local topography, geology, and ground conditions. These conditions are significant factors in the evolution and form of the historic landscape evident in each zone. Please refer to Sections 14.3.63 to 14.3.72 of the ES for the description of these zones.

13.5.36 The Scheme has been assessed as having a Moderate significant collective impact upon the historic landscape. Please refer to Section 14.5.32 of the ES.

13.5.37 The principal source of the impact is the visual and noise intrusion on the key characteristics of the visible and accessible landscape, as well as the collective impacts of the Scheme on individual receptors including historic trackways and historic hedgerows. The latter have been assessed individually and are set out in Table 14.4 of the ES (Page 14 - 36 to 14 - 54). Table 14.4 of the ES assigns a baseline sensitivity value to each receptor, so as to show the importance of the Historic Landscape feature. The assessment details the magnitude and form of the potential impact from the Scheme, and the significance of the impact with and without proposed mitigation.

13.5.38 For all Historic Landscape Features and Important Hedgerows listed in table 14.4 of the ES, the assessment of the significance of impact when mitigation is taken into account are of slight significance, with the exception of the receptor OA 212: Historic Landscape Feature Quarry site which is assessed as uncertain; and nine Important Hedgerows which have been assessed as a Moderate significance of impact (OA 500-502, 506, 520, 521, 528, 535 and 547).

Townscape

Drawings are required at 'key points' in order to be able to assess the likely environmental impact at particular locations, for example: -

- ***The new Ninfield Road Overbridge at Sidley.***
- ***The new Woodsgate Park Overbridge.***
- ***The new London Road Junction.***
- ***The setting of the Chapel Path Underpass.***
- ***The Belle Hill Junction at the southern end of the Scheme.***
- ***The Queensway Junction at the northern end of the Scheme.***

13.5.39 Additional details of these proposed areas and features are included within the Addendum Design and Access Statement.

13.5.40 Larger scale drawings have been presented of each of the areas. Please refer to the Addendum Design and Access Statement (Section 5 and 6). The details of the two urban bridges, Ninfield Road and Woodsgate Park, have been discussed with officers of the Planning Authority prior to finalising their design and have followed their recommendations. Both bridges are replacements for former railway structures in the same location. The design endeavour has been to replace the bridge with structures which continue to contribute to the character of the existing townscape. A balance has been struck between the need for modern design and creating a feature of value to the street scene above. Parapets are therefore proposed to be of brick finish albeit not as substantial as the existing features. The main structure would be of concrete construction with moulded finish to reduce the visual impact of exposed concrete. The bridges would incorporate badger tunnels in both directions. Subject to the outcome of the latest round of wildlife studies, bat nesting sites would be built into the structures.

13.5.41 More detail of the Chapel Path underpass is provided. The main principle of the design of this feature would be to ensure that there would be a line of sight from one side of the underpass to the other. Drawing 208/31/31/1 (as presented in Appendix J.3 of this Addendum to the ES as Figures 13.1a and 13.1b) illustrates that a clear view could be gained from London Road through the underpass to the path to the west of the proposed Scheme. The flank walls to the entrance would have a wide splay to maximise the feeling of space and be moulded and finished to aid weathering and minimise graffiti. The whole structure would be light and airy and the path would be to a similar level to the existing path.

13.5.42 The three road junctions would be heavily influenced by highway engineering design considerations, with the scope for environmental design being limited. The Belle Hill Junction would be little different to the existing, but with an additional lane feeding the proposed Scheme. Queensway and London Road junctions would both be new and would be signalised junctions, partially to reduce the environmental effects and size of the engineering work. The layout of the junctions is illustrated on the submission plans (Drawings 208/31/5 and 6. Please refer to Appendix J.3).

As a detailed planning application, "typical structures" that are 'not to scale' is not acceptable. More detailed drawings are required.

13.5.43 Additional information is included within the Addendum Design and Access Statement. This includes scaled drawings of the structures and details of how additional wildlife connectivity would be achieved through and across them where necessary. The exact detail of some of the concrete finishes is yet to be finalised and would be agreed with the Planning Authority at the design detail stage.

In order to assess the environmental impact of the new Scheme being elevated above the height of the existing "Chapel Path", (the pedestrian route to the adjacent schools) more specific information in plan form and section illustrating the extent and potential impact of elevating this section of the new road is required.

13.5.44 The illustrations in the Addendum Design and Access Statement (Drawing 208/31/31/1, presented in Appendix J.3 of this Addendum to the ES as Figures 13.1a and 13.1b), provides more information. The headroom under the underpass would be 2.4m and the difference in level between the path level and road surface would be approximately 3.3m. There would be a fall between in ground level between the path on London Road and the centre line of the Chapel Path as it would pass beneath the proposed Scheme. The effective height of the proposed Scheme would be in the order of 2.5m above the level of London Road at the highest point, as it crosses Chapel Path.

The two photomontages illustrated on Figure 13.16.11.02 entitled "Photomontage 24 – Urban Viewpoint 016" are incorrect and misleading as any trees would have to be planted behind, rather than in front of the new fence. New photomontages should be prepared by the applicant.

13.5.45 The assumption that trees would only be behind the fence is not correct. The more detailed plan which is within the Addendum Design and Access Statement makes this clear. Please refer to Section 6 of the Addendum Design and Access Statement.

13.5.46 Whilst the location of the trees at the southern end may be slightly incorrect and there is a visual "break" in one of the lamp posts, the overall image is correct and gives a fair and reasonable impression of the proposed Scheme. This is particularly the case when considering that the Highway Authority will not finalise the detailed design until consultation has been held with the local community.

Figure 13.16.11, entitled "Photomontage 26 – Urban Viewpoint 020" is also incorrect and misleading as it claims to illustrate how London Road would look when the new road has been built and in 15 years time, but fails to show:

- ***The new Scheme, as opposed to the retained London Road;***
- ***The elevated section of the new Scheme that would be required to enable the "Chapel Path Underpass" to be constructed at the point where the existing houses are shown demolished;***

- ***Any details of the junction with Belle Hill, (and associated clutter), in the distance;***
- ***Any details of the new junction with the Scheme, (which would have been to the right of the view illustrated);***
- ***New photomontages should be prepared by the applicant.***

13.5.47 Photomontage 26 – Urban Viewpoint 020 is correct. It shows the proposed Scheme behind a noise fence. The road in the view would be the southern portion of the London Road with an impression of the community open space to be developed over the flood water storage tank. It does show the elevated section of road over the Chapel Path underpass but it should be noted that the path would fall from London Road to pass beneath the proposed Scheme, such that the new road surface, at its highest point would be only 2.5m above the level on London Road. More details of the Chapel Path underpass are shown in the Addendum Design and Access Statement. The Belle Hill junction would not be visible from this location. The new junction with the Scheme would be out of view, behind the view point. Therefore no new photomontage is presented in this addendum but the Addendum Design and Access Statement (Section 6) does include additional material associated with the illustrative scheme for the community open space.

13.6 IEMA comments

Table 13.5. The explanations of each of the classifications for sensitivity should provide a clearer indication of the factors that contribute to the sensitivity of the landscape.

13.6.1 The text associated with the table, at 13.2.22 onwards in the ES, refers to background guidance upon which the methodology is based. The factors contributing to the sensitivity of the landscape to the proposed change are covered in that guidance and so have not been repeated in the ES.

13.6.2 The guidance explains that determination of sensitivity of the landscape is based upon an evaluation of key elements or characteristics likely to be affected. It would consider such factors as quality, value, contribution to landscape character and the ability of elements or characteristics to be replaced or substituted.

The evaluation of the sensitivity of the landscape generally shows some consistency between the evaluation of the quality and value of the landscape and the sensitivity. An exception is the South Slopes of High Weald which is stated to be of high quality and value, but is considered to be moderately sensitive to change (Table 13.11). A justification for this apparent inconsistency would be helpful.

13.6.3 There is no linear relationship between quality, value and sensitivity to change in Table 13.11. Each indicator requires a separate assessment, so it is not necessarily the case that a landscape with high quality and value would have a high sensitivity to change. In the case of the Southern Slopes of the High Weald, the key characteristics of ridges, ghylls and abundant woodland, create an ability to

accommodate some change of the nature being proposed, and generate a moderate sensitivity to that change.

13.7 Conclusions

13.7.1 This chapter of the Addendum to the Environmental Statement has considered the issues raised by both the Planning Authority and IEMA under Landscape and Visual impact, either by comment here or in the Addendum Design and Access Statement. Fuller information has been provided regarding the design appearance of the Scheme at the Bexhill / urban end of the proposed Scheme. This includes indications of the type of measures which the Highways Authority would wish to discuss with the local community on London Road south. Scale drawings now more fully illustrate the proposals for new and replacement structures in the urban and rural areas, including Chapel Path.

13.7.2 The vegetation loss drawings have been reviewed and revised for greater clarity. Fuller detail has also been provided regarding engineered landforms incorporating the Greenway and interface between landform and noise fencing.

13.7.3 A series of ZVI drawings have been provided to assist in the understanding of the contribution which proposed landform would have on minimising visual effects upon the countryside.

13.7.4 Modifications have been made to visual impact mapping to aid in understanding.

13.7.5 Further clarity has been provided about fences in both the urban and rural area, including where further details would need to be agreed in the future.

13.7.6 Clarification has been given over points raised in relation to methodology and the relationship of remoteness map and ZVIs.

13.7.7 A set of plans has been provided to illustrate the LAeq 50dB(A) noise contours for 2010 and 2025 over the proposed Scheme, including the Greenway.

13.7.8 The need for 2 bridges in the Powdermill Valley has been clarified.

13.7.9 Photomontages have been reviewed, although no changes are considered necessary.

13.7.10 Further commitments have been made by the Highway Authority about how landscape and wildlife management proposals would enjoy ring fenced funding, generated by land within the Scheme.

13.7.11 As a result of these considerations, no material changes have been made to the results of the assessment reported in the ES.

14 Cultural Heritage

14.1 Introduction

14.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 14 Cultural Heritage of the ES for the Scheme.

14.1.2 Following discussion with East Sussex County Council (ESCC) and English Heritage (EH) a detailed proposal for further fieldwork to be undertaken after determination of the planning application is also submitted. This includes possible mitigation measures which may be required and indicative costs, in order to demonstrate that ESCC (as Scheme promoters) understand the potential scope and financial implications of the work which might be required following archaeological trial trench evaluations.

14.2 Regulation 19 - summary

14.2.1 Regulation 19 issues raised as a result of a review by the Determining Authority are summarised here:

14.2.2 Results of the Stage One evaluation should form part of the ES in order to help inform a planning decision, by providing Scheme-specific detail about cultural heritage features of significance to the Scheme. Additional archaeological work is required, in the form of:

- specialist geoarchaeological field investigations of four ‘wet’ zones and margins;
- LiDAR survey of the Scheme; and,
- surface artefact collection survey (fieldwalking) (ES Section 14.7.6).

14.2.3 The ES fails to note that construction of the Scheme might also lead to indirect effects, and clarification is required on the scope and direction of the stage one work.

14.2.4 Additional site walkover and geophysical surveys are required to cover these points.

14.2.5 Queries over whether the Stage Two works should have been completed prior to submission of ES have also been raised, and clarification of this is required.

14.3 IEMA Review - summary

14.3.1 IEMA make the same point as arising from the Determining Authority's review, that a reasoned justification should be provided for not undertaking the stage two archaeological survey work in order for the information to be included in the ES.

14.3.2 The Institute also raise the point that all additional information which is to be submitted post publication of the ES, should be clarified as being subject to the consultation requirements set out in the EIA Regulations.

14.4 Consultation

14.4.1 Following submission of the ES and receipt of the subsequent comments a meeting was held at County Hall, Lewes on 30th November 2007 to discuss the Cultural Heritage issues raised by both the Regulation 19 and IEMA reviews. A second meeting was held between the County Archaeologist, English Heritage, ESCC (as Scheme promoters), Oxford Archaeology and Mott MacDonald at County Hall, on 17th April 2008. Please refer to Appendix B.1 Records of Consultation for the minutes to these meetings.

14.4.2 The updated baseline information was reviewed and a strategy with regard to further work in respect of the potential archaeological resource was agreed. Further details can be found in section 14.5.15 below.

14.5 Regulation 19 Issues

Results of the Stage One evaluation should form part of the ES in order to help inform a planning decision about the Scheme by providing Scheme-specific detail about where cultural heritage features exist, their nature, condition and significance, along with the nature of any impacts (direct, indirect, temporary, permanent and cumulative) and how these would be mitigated by a combination of design and further archaeological work. The evaluation consists of:

- specialist geoarchaeological field investigations of four 'wet' zones and margins;
- LiDAR survey of the Scheme; and,
- surface artefact collection survey (fieldwalking) (ES Section 14.7.6).

14.5.1 The Stage 1 evaluative exercise has been completed. The reports on the Geoarchaeological Field Investigation (which has been combined with the existing assessment report to provide a full assessment of the wetland areas), the LiDAR Survey Analysis and the Surface Collection Survey are summarised below and submitted in full in Appendix K (K.1, K.2, K.4). A specialist geophysical survey of the valley areas undertaken to map the underlying peat deposits and inform future work is also submitted (K.3).

Geoarchaeological Field Assessment (Appendix K.1)

14.5.2 Oxford Archaeology (OA) was commissioned by ESCC to undertake a Geoarchaeological Assessment for the Scheme. The work was carried out between March 2006 and October 2007.

14.5.3 The Geoarchaeological Assessment consisted of a staged approach in order to assess the archaeological potential of the proposed route. The route crosses an intricate pattern of river valleys and ridges. The proposed Scheme skirts the edges of the Combe Haven Basin, which is a low-lying area that was once part of the Sussex Levels. The first phase of assessment, undertaken as part of the Environmental Impact Assessment, consisted of a desk based study of geotechnical and archaeological watching brief records, and placed these within their wider geoarchaeological context. This study was submitted as part of the ES (Volume 2. Appendix 14-E).

14.5.4 The second phase consisted of field investigation, which comprised nine boreholes and eight test pits targeted on specific deposits within the four valleys of the Combe Haven, Watermill Stream, Powdermill Stream and the Decoy Pond Stream, which are crossed by the proposed route. The Geoarchaeological Assessment identified a high degree of consistency within the valley sequences, with good potential for the preservation of environmental and organic remains. This allowed an interpretation of the vegetation history of the area from the Mesolithic onwards. The investigation produced evidence of small clearings within the valley bottoms dated by radiocarbon to c 3430±90 BC (Early-Mid Neolithic) and probably caused by human activity.

14.5.5 A Late Neolithic / Early Bronze Age flint scatter was identified on the edge of the Watermill Stream Valley. The stratigraphic location of these finds and their fresh condition indicate that there is a good possibility that they have been recovered from an in-situ scatter. Such assemblages are exceptionally rare and present unique insights into the performance and structuring of activities in the past. It is therefore possible that these flints provide an indication of a regionally, or nationally, important site. Material, possibly derived from a domestic oven or pottery Kiln, potentially dating to the early historic periods was also recovered from the edge of the Combe Haven Stream Valley.

14.5.6 The Combe Haven and its tributary valleys are therefore important as an example of a low-lying area devoid of upstanding monuments, which has the potential to produce evidence of significant early prehistoric exploitation and occupation. The previous desk based study has been combined with the results of the later fieldwork investigation to produce the Geoarchaeological Assessment.

14.5.7 The Geoarchaeological Assessment submitted here is Issue 2 and has been updated from the version issued to the Planning Authority in November 2007 to include information from Radio Carbon dating.

LiDAR Survey Analysis (Appendix K.2)

14.5.8 OA was commissioned by ESCC to provide an analysis of a LiDAR survey carried out by the Environment Agency in January 2007, along the route of the Scheme. The report gives a brief overview of the technology, outlines the methodologies used and presents the findings of the analysis. Nothing new of archaeological significance was identified but the data has enhanced understanding of what is known already as well as providing a useful resource for further work.

Specialist Geophysical Survey (Appendix K.3)

14.5.9 From the 3rd to 6th March 2006 Dr. Richard Bates and Dr. Martin Bates with guidance from OA staff geoarchaeologist Carl Champness undertook a geoarchaeological site investigation using a geophysical technique to characterise the sub-surface deposits of the valley areas and in particular to identify the location and distribution of any areas of gravel highs ('islands') within the floodplain. Additionally the edge of the floodplain was mapped and located where possible.

14.5.10 The evidence from the geophysical survey indicates that channel and island patterns consistent with other lowland river situations in the UK and Europe exist in the study area. The survey has successfully demonstrated that coherent patterns reflecting buried geomorphology exist within the study area and these patterns have enabled areas of varying archaeological character and potential to be identified and located. This information has been used to formulate a strategy for effectively evaluating the areas which may be impacted by the Scheme using trial trenching and test pitting.

Surface Collection Survey (Appendix K.4)

14.5.11 During March 2007 OA carried out a surface collection survey (fieldwalking) for the proposed Scheme. The survey recovered an assemblage of flint artefacts dating from the Mesolithic, Neolithic and possibly Bronze Age. The majority of artefacts logged were fire-cracked flint. These were identified in all the fields, with one slight concentration in Field 2 (Surface Collection Survey, Section 6.1.6 to 6.1.8). Preparation flakes were the most frequent artefact retained, but other notable finds include two blade tools, probably of Mesolithic or Neolithic date, and two side scrapers of possible Bronze Age and Neolithic date. One significant concentration of flint tools and fire cracked flint was identified in Field 5 (Surface Collection Survey, Section 6.1.15 to 6.1.17). These were of varying date and confirm the utilisation of this part of the area, a ridge of higher ground, during the prehistoric period. No

specific sites were identified, but the potential of the areas of higher ground and margins surrounding the wet valley areas to contain possible prehistoric archaeological sites was confirmed.

The ES fails to note that construction of the Scheme might also lead to indirect effects, particularly on the hydrology and therefore the long term preservation of waterlogged deposits to the north and south of the Scheme area. This important factor needs to be addressed.

14.5.12 For clarification OA would regard an impact on buried archaeology caused by a change in hydrology to be a direct rather than an indirect impact. The potential for an impact on buried archaeological deposits if there are changes in hydrology has been noted in the ES Chapter (Section 14.5.7 and 14.5.16). Chapter 9: Water Quality and Drainage does not indicate that significant changes in ground water levels are expected to result as a consequence of the Scheme. There may be a need for some temporary de-watering to facilitate construction (Section 9.6.17) and this is noted in the Cultural Heritage Chapter. However, Section 9.7.19 states that there would be little impact on groundwater resources and Section 9.8.6 concludes that the Scheme would be neutral with respect to groundwater during operation.

14.5.13 Although no significant permanent reduction in ground water level is currently predicted the statement made in the original Cultural Heritage Chapter, that changes in hydrology which result in de-watering of preserved archaeological deposits could result in a significant adverse direct impact, can be reaffirmed. Hydrological changes arising from development can be difficult to predict and any significant design changes would be assessed for their hydrological implications. Monitoring of ground water levels would be undertaken in relation to identified sites. If unexpected reductions in water levels are observed the situation would need to be assessed to determine whether a specific archaeological site will be affected and whether a mitigation strategy should be implemented. Particular attention would be required if specific waterlogged archaeological sites are encountered during the project, especially if these are associated with the construction of one of the drainage or balancing ponds. If the impact on such features is mitigated by a design change (relocation or reshaping of the pond) monitoring of the ground water levels and possible mitigation measures to ensure the continued preservation of the deposits would be required.

Clarification required on whether stage one work would also cover side valleys, borrow pits, balancing ponds, greenway, enabling works etc. Further walkover and geophysical surveys should be undertaken to cover these.

14.5.14 The Stage 1 investigations do cover all the areas specified as far as ground conditions allowed. The specialist geoarchaeological field investigation is an 'assessment' of the wet zone areas and is not intended to be a full evaluation (it is proposed to undertake this post-determination)). The sequences recorded in the test pits combined with the information from boreholes and desk based research are adequate to characterise the potential for the whole of the wet zone area. Additional test pits are not required at this stage to fulfil this aim, which has now been successfully achieved. The report on the potential of the wet zone areas is submitted in Appendix K.1 and has confirmed and clarified the potential of the wet areas as assumed in the original ES chapter (14.4.7 and 14.4.8).

14.5.15 In line with the strategy agreed with ESCC and EH and outlined in Comment 4 response below, a further specialised geophysical survey has now been undertaken to map the peat deposits in the areas impacted by the Scheme, including the areas of proposed balancing ponds. This enables the areas of potential referred to in the Geoarchaeological Assessment to be more accurately located on the ground. This report is submitted in Appendix K.3.

Stage 2 work – Questions over whether this should have been completed prior to submission of ES. EH refers to government guidance that states it is undesirable to leave it until after the determination of the planning permission.

14.5.16 Generally it is preferable to undertake archaeological surveys prior to determination of planning applications. In this case a large amount of both desk and field based work has been undertaken including:-

- Desk Based Assessment;
- Field Walkover Survey;
- Geophysical Survey;
- LiDAR Survey Analysis;
- Surface Collection Survey (Fieldwalking);
- Desk Based Geoarchaeological Assessment;
- Geoarchaeological Field Assessment (test pits and boreholes); and,
- Specialist Geophysical Survey (mapping peat deposits).

14.5.17 The archaeological work already undertaken, including test pit assessment of the valley areas, provides a good indication of the archaeological potential of the Scheme. The dry higher ground areas of the Scheme can be assessed as low risk in terms of their potential to reveal unexpected archaeological deposits. In the event that archaeology is found in those areas it is unlikely that the nature and scale would be such that it would prove difficult to deal with using the mitigation strategy outlined in the original ES chapter (14.4.12).

14.5.18 ESCC will comply with any conditions imposed on the Scheme. The budget for the Scheme will be evaluated by the Department of Transport and will be informed by what needs to be accomplished in archaeological terms. On the basis that ESCC are undertaking to fully comply with a condition to undertake further comprehensive field evaluation of the Scheme and any subsequent mitigation measures required, both English Heritage and the ESCC County Archaeologist have agreed in principle that further work can be undertaken post determination of the planning application.

14.5.19 English Heritage and the County Archaeologist's approval for this strategy is conditional on ESCC demonstrating that they fully understand the potential scope, programme, design and financial implications of this course of action. In order to achieve this it was agreed at the meeting on 30th November 2007 that OA would commission on behalf of ESCC a specialist geophysical survey to enhance knowledge of the location and character of the valley areas and refine the parameters of further work. This survey is submitted in Appendix K.3 and was successful in defining the limits of the wet valley (peat deposit) areas and the 'marginal' areas between the wet valleys and dry higher ground.

14.5.20 English Heritage and the County Archaeologist also required an outline Written Scheme of Investigation (WSI) to be produced outlining a proposal for a full trial trench evaluation of the Scheme. In addition this document should contain a discussion of the possible archaeological 'sites' which might be encountered during the evaluation or the construction phases of the project and the possible mitigation measures which might be required. The examples should include a worst case scenario and a broad idea of the costs associated should also be given, including a general indication of a 'worst case scenario' budget for mitigating the archaeology of the Scheme as a whole.

14.5.21 The purpose of this WSI is to demonstrate that ESCC understand the scope of their commitment in agreeing to complete the evaluation and subsequent mitigation measures as a condition of planning permission and that reasonable assumptions are made regarding budgets for dealing with the archaeology of the Scheme.

14.5.22 The results of the Geoarchaeological Geophysical Survey, the WSI and a draft of this chapter were presented and discussed at the consultation meeting on 17th April 2008 where the content and strategy was agreed by all parties. Please refer to Appendix B.1 Records of Consultation. An Outline Written Scheme of Investigation (an edited version of the document discussed at the meeting) providing a suggested approach for the full evaluation of the Scheme is presented with this Addendum in Appendix K.5.

14.6 IEMA Review

14.7 ***A reasoned justification should be provided for not undertaking the archaeological survey work in order for the information to be included in the ES. This is particularly important for the cultural heritage surveys which are intended to be undertaken prior to the determination of the planning application.***

14.7.1 Please refer to section 14.5.15 above.

Given the proposal to provide the information after the publication of the ES clarification should also be provided that the additional information, when submitted, would be subject to the consultation requirements set out in the EIA Regulations.

14.7.2 Additional surveys have now been completed as set out in section 14.5.1 above. Full reports on this work are contained in Appendix K and are subject to the consultation requirements set out in the EIA Regulations.

14.8 Conclusions

14.8.1 The outstanding surveys referred to as Stage 1 surveys in Chapter 14, Cultural Heritage of the ES have been fully completed and are submitted as part of this Addendum. In addition the mapping of the wet area deposits using geophysics which was to form part of the Stage 2 works has been brought forward and is also included in this Addendum. The additional information does not change the baseline assessment made in Chapter 14 of the ES, but does confirm and clarify the initial findings.

14.8.2 The original proposal to defer full trial trench evaluation until after the determination of planning permission has been subject to consultation and agreed. This consultation has included the preparation of a WSI to provide reassurance that ESCC understand and acknowledge the implications of this approach. An Outline WSI suggesting an approach for undertaking the full evaluation of the Scheme post-determination is submitted as part of this Addendum.

15 Effects on pedestrians, cyclists and recreation users and Social and Community Effects

15.1 Introduction

15.1.1 This Chapter of the BHLR Addendum to the ES provides qualifying information to address the Regulation 19 issues raised by the Determining Authority, and the comments made by the external organisation of IEMA with regards to Chapter 15A 'Effects on Pedestrians, Cyclists and Recreational Users' and Chapter 15B 'Social and Community Effects' of the ES for the Scheme.

15.2 Regulation 19 Issues - summary

15.2.1 Following consultation, Regulation 19 comments raised by the Local Planning Authority were in relation to:

consistency in severance significance criteria between chapter 15A and15B;

the severance impact of the new road in relation to new traffic levels;

details and results of road side survey data;

summary of the number of affected properties; and,

an assessment of the number of people employed on site of commercial properties and potential job losses, along with an assessment of the future viability of the business.

15.2.2 The comment on severance impact of the new road in relation to new traffic levels was ambiguous. There is uncertainty as to whether the emphasis was placed on considering new severance, considering the new road portion, or considering new traffic levels. The context of these comments is not clear, and thus the response to follow (below) aims to provide more details on all of these aspects.

15.3 IEMA Review - summary

15.3.1 An independent review by the Institute of Environmental Management and Assessment (IEMA) raised comments regarding:

- the significance assessment of the lost land impact for the Crowhurst Shooting Club; and,
- clarification of the basis for the conclusion in the final section of 15B.

15.4 Consultation

15.4.1 Following consultation with ESCC, the agreed strategy for addressing the Regulation 19 issues and IEMA comments is as below:

- background documents to be reviewed;
- additional site visits to be undertaken;
- additional meetings with Sea Space[1] and ESCC to be organised, specifically to discuss regeneration aspects;
- communication with ESCC's property department required, with the specific aim of obtaining further information in reference to properties and employees affected by the Scheme, as well as business viability;
- coordination with the authors of the BHLR Regeneration Statement (ESCC, 2007), and other related chapters required; and,
- additional details from the 2004 road side survey to be ascertained and re-presented.

15.4.2 Each topic specific Regulation 19 issue and IEMA review comment is presented below under a separate heading, commencing with Regulation 19 issues.

15.5 Regulation 19 Issues

There does not appear to be consistency in severance significance criteria between chapter 15A and 15B.

15.5.1 The severance significance criteria in Chapter 15A, 'Effects on Pedestrians, Cyclists and Recreational Users' and in Chapter 15B 'Social and Community Effects' of the ES have been developed taking into consideration the Design Manual for Roads and Bridges (DMRB) guidance for both new severance and relief from existing severance.

15.5.2 Severance significance criteria does vary between the chapters, as the nature of severance impact is fundamentally different when dealing with recreational users as in Chapter 15A, as opposed to the broader impact of severance on communities as described in Chapter 15B. This is because severance in the community is generally an issue of practical everyday life such as getting to work, school, shops and the full range of services offered in settlements. The walkers or cyclists involved are largely utility walkers or cyclists rather than people purely engaged in a recreational experience. For the latter group of people, the issue of distance and time involved is less urgent than that of people going about their daily business. Nonetheless, for

[1] Sea Space is the economic development company for Hastings and Bexhill set up by the regional development agency and local councils.

many people cycling to work is also an enjoyable experience and so the quality of the journey also matters. Consequently, the issues are subsumed within the wider recreational experience which includes tranquillity and visual quality.

15.5.3 There is no explicit definitive guidance on significance criteria within DMRB for this recreation group. Subsequently, a multidisciplinary team including Counsel, recreational specialists, socio-economic expertise, engineers, the project manager and the client contributed to the development of Table 15A.1 'Significance Criteria for Recreational and Non-motorised Utility Users' in the ES. This is an attempt to capture the essential experiences and expectations by which impacts on recreation can be measured, and of which severance is only a part. It would appear cumbersome and even misleading to separate out the severance aspect of the recreational experience from those of tranquillity and visual quality since a judgement is made on the impact upon the overall recreational experience.

15.5.4 In Chapter 4 of DMRB, Volume 11, Section 3, Part 8 entitled 'Changes in Amenity', amenity is defined as 'the relative pleasantness of a journey'. The importance of landscape and townscape quality is stressed rather than just 'volume and composition of traffic' which are heavily stressed in the 'New Severance' guidelines as applied to communities. In the case of Social and Community Effects, Section 6 on New Severance (DRMB Volume 11, Section 3, Part 8), has been correctly followed in Chapter 15B. This is further reinforced by discussion of new severance in relation to traffic flows presented in Section 15.5.7 below. The guidelines deal much more explicitly with utility walkers and indeed state:

'the guidelines apply specifically to pedestrians; cyclists and equestrians are less susceptible to severance because they can travel more quickly than people on foot.' (DMRB, 1993:6/1)

15.5.5 Section 6.1 of Chapter 6 of the DMRB Volume 11, Section 3, Part 8 highlights the way in which the different nature of the impact on communities must be measured by different criteria than those used for recreation. It emphasises the important factors of numbers of people affected, vulnerable groups affected such as children, the aged or disabled, and time taken to cross very busy roads at peak hours. This is because, to a greater degree than with recreation, the wider community is more greatly affected by severance since these journeys are made on a more regular basis. Therefore a greater number of people are affected as well as a greater proportion of vulnerable groups. It is noted that vulnerable groups use footpaths less frequently for recreation than for accessing shops, schools or other utility services.

15.5.6 In summary, the evident inconsistency in significance criteria is specifically because the nature of the impact is fundamentally different when dealing with recreational users as opposed to the broader impact of severance on communities. These differences are supported in the DMRB guidance.

The severance criteria do not consider the severance impact of the new road in relation to new traffic levels – new severance as outlined in DMRB.

15.5.7 New severance as outlined in DMRB is applicable to both the direct effects of a scheme and to effects caused by increases in traffic levels on existing roads. The guidelines apply specifically to pedestrians and are related to hindrance to movement for example:

- pedestrian at-grade crossing of a new road carrying X[2] vehicles per day;
- a new bridge that needs to be traversed; or,
- walk journeys that are increased.

15.5.8 In the ES, significance criteria for severance are identified in section 15B.4. Table 15B.1 outlines the categories of significance reflecting DMRB guidance for both new severance and relief from existing severance.

15.5.9 The Regulation 19 issue regarding new severance and traffic flows is ambiguous. Clarification has been sought, but the context of the statement is unclear. The query has therefore been considered with regards to:

- the community severance assessment of the new road; and,
- presentation of the traffic levels behind the assessment.

Community Severance Assessment of the New Road

15.5.10 The new road would not have any pedestrian at-grade crossings and therefore the first of the three aforementioned DMRB criteria related to hindrance of movement is not applicable. Furthermore, the new road does not have existing communities adjacent to the Scheme, other than the Bexhill Connection section. However this section would be aligned along the former railway line which is private land, not a designated open space, and not an official thoroughfare.

15.5.11 The new road would also pass through open countryside and would affect a number of recreational paths. The severance effect on recreational users has been addressed in Chapter 15A. Specific references to severance on recreational users include the definition of beneficial and adverse impacts, in the definition of impact significance, in the description of existing conditions related to rights of way networks and as well as cyclists, in Table 15.1.4 Operational Summary Impact Table for Recreation and Utility Users and in the concluding statements.

[2] The DMRB criteria is as follows: slight new severance – pedestrian at-grade crossing of a new road carrying below 8,000 vehicles per day (AADT); moderate new severance - pedestrian at-grade crossing of a new road carrying between 8,000 and 16,000 vehicles per day (AADT) in the opening year; severe new severance - pedestrian at-grade crossing of a new road carrying over 16,000 vehicles per day (AADT) in the opening year.

Presentation of the Traffic Levels behind the Assessment

15.5.12 The assessment of the severance impacts of the new road does consider new traffic levels amongst other criteria. However changes in traffic levels were not presented explicitly in Chapter 15B but were presented as percentages of change in Figure 15B.7 of the ES which is a direct output from the traffic model used.

15.5.13 Assessment during the construction period has been based on the effects of construction traffic movement and on traffic management measures described in Chapter 3B: Construction Strategy of the ES.

15.5.14 For operational effects, the traffic forecasts for the opening year 2010 have been used to assess the potential effects on pedestrian severance as a result of changes in traffic levels for 2010 without the Scheme. The significance criteria used for assessment of severance impacts is set out in Table 15B.1 of the ES and is based on whether traffic levels have increased or whether the walk journey or impedance to walk journey in crossing the road has changed, whichever is greater in terms of adverse impact.

15.5.15 Table 15.1 below presents the actual traffic figures extracted from the traffic model.

Table 15.1: Traffic Levels

Name	2010 DM[3] No. vehicles	2010 DS No. vehicles	Numerical Difference	% Difference
Bexhill Connection	0	20300	20300	NA
Main Scheme	0	22100	22100	NA
B2092 Queensway	12000	21900	9900	83
B2093 The Ridge near Grange Road	13700	18200	4500	33
A259 Barnhorn Road	18100	22600	4500	25
B2093 The Ridge	20200	25200	5000	25
Gillsmans Hill	7800	9700	1900	24
A259 Little Common Road	16500	19500	3000	18
A2100 The Ridge West	23100	27000	3900	17
Napier Road	9700	11300	1600	16
A21 Sedlescombe Road North (N portion)	17700	19500	1800	10
A259 London Road at proposed junction with A259	7600	8300	700	9
Ironlatch Avenue	8400	8800	400	5

[3] DM: Do minimum scenario; DS: Do something scenario

Name	2010 DM[3] No. vehicles	2010 DS No. vehicles	Numerical Difference	% Difference
A259 Rye Road	15000	15800	800	5
A28 Westfield Lane	4700	4900	200	4
A2100 London Road	8000	8300	300	4
A21 (T)	11500	11700	200	2
A21 Bohemia Road	12500	12600	100	1
A2101 St Helens Road	14700	14700	0	0
Ballards Hill	4500	4500	0	0
A21 Sedlescombe Road North (S portion)	14300	14100	-200	-1
B2096 Kane Hythe Road	5200	5100	-100	-2
A269 Ninfield Road	9300	9000	-300	-3
B2159 Battle Road	10000	9600	-400	-4
A2036 Wrestwood Road	8800	7900	-900	-10
A259 Marina	16100	14100	-2000	-12
B2909 Cropwhurst Road	15600	13800	-1800	-12
A259 Marine Parade	18800	16400	-2400	-13
A2100 Lower Lake	15800	13800	-2000	-13
A271 North Trade Road	15300	13300	-2000	-13
A2100 Hastings Road	13400	11500	-1900	-14
A271 Ashburnham Road	11200	6400	-4800	-16
A269 London Road	7900	5900	-2000	-25
Crowhurst Road	3700	2500	-1200	-32
A259 Bexhill Road	32000	21600	-10400	-33
B2092 Harley Shute Road	15300	9600	-5700	-37
Henley's Down	4400	2600	-1800	-41
A259 King Offa Way / Belle Hill	18700	10600	-8100	-43
B2095 Powdermill Lane	10200	5600	-4600	-45
Watermill Lane	6100	300	-5800	-51
B2095 Hooe Road	4400	2100	-2300	-52

15.5.16 In summary, severance criteria have been assessed according to the community severance assessment of the new road and the presentation of the traffic levels behind the assessment. The community assessment is specific to the assessment of severance on recreational users, as the new road does not have existing communities adjacent to the Scheme.

15.5.17 The traffic levels behind the assessment of severance on the community are presented in their raw form in Table 15.1 above. For operational effects on severance brought about by changes in traffic levels from the Scheme, the predicted

traffic level changes as a percentage difference from the Do Minimum to the Do Something scenario have been used in Chapter 15B of the ES. The assessment significance criteria is set out in Table 15B.1. Overall, the impact of the Scheme on community severance is considered to be moderate beneficial (section 15B.7.6).

There does not appear to be a copy of the results from the road side survey data collected in 2004 even though it is referred to in 15B.5.13. This should be in an appendix to give information on survey size etc.

15.5.18 In section 15B.5.13 of the ES Chapter 15B, the traffic condition baseline refers to a road side interview survey data collected in 2004. In fact the Roadside Interview Survey (RSI) was undertaken on 22nd June 2005 on Crowhurst Road, southeast of the junction with Forewood Lane and Ballards Hill in the westbound direction. The survey was undertaken between 07:00 and 19:00. A sample of 1116 vehicle drivers were stopped and asked questions relating to the trip they were making that day for the RSI. The classified count in the same direction recorded a total of 1327 vehicles (excluding pedal cycle and motor cycles) over the same 12 hour period. A copy of the questionnaire is shown in Appendix L.1.

15.5.19 On the same day and for the same hours, a manual classified count (MCC) was undertaken. This recorded the total number of vehicles in each of the chosen categories by direction and by half hourly period. The following vehicle classifications were used:

- Pedal Cycle;
- Motorcycle;
- Car;
- Light goods vehicle (LGV);
- Rigid un-plated vehicle (RUP);
- Rigid plated vehicle (RP);
- Articulated vehicle (ART);
- Bus; and,
- Minibus (MB).

15.5.20 Table 15.2 and 15.3 below show the results of the MCC for eastbound and westbound traffic respectively with regards to numbers of vehicles by type, for the am peak hour of 08:00-09:00, the inter-peak period between 10:00 and 16:00 and the pm peak hours of 16:00 to 18:00. In addition, the full 12 hour survey period is included for both the eastbound and westbound traffic respectively. The combination of the RSI with the accompanying MCC resulted in 84% of the total westbound traffic being stopped and interviewed over the full 12 hour survey period.

Table 15.2: Manual Classified Count Results – Eastbound

Time	Pedal cycle	Motorcycle	Car	LGV	RUP	RP	ART	Bus	MB
08:00-09:00	0	0	275	17	1	0	0	0	0
10:00 – 16:00	7	3	285	50	6	1	0	1	4
16:00 – 18:00	8	4	194	44	1	0	0	0	0
07:00 – 19:00	13	11	1128	168	11	2	0	2	4

Table 15.3: Manual Classified Count Results – Westbound

Time	Pedal cycle	Motorcycle	Car	LGV	RUP	RP	ART	Bus	MB
08:00-09:00	0	0	164	13	0	1	0	1	0
10:00 – 16:00	1	7	660	86	5	0	0	3	3
16:00 – 18:00	2	4	334	51	4	0	0	0	2
07:00 – 19:00	9	16	1387	180	10	1	0	4	8

15.5.21 The postcode and journey purpose information obtained from the roadside interview survey was used to build the trip matrices used in the traffic modelling and assessment of the Bexhill Hastings Scheme. A sector based analysis of the postcode information obtained was undertaken. The study area was divided into six sectors as shown on Figure 6.1 from the Traffic Forecasting Report and reproduced in Appendix 15 – Figures as Figure15 B.10.

15.5.22 Table 15.4 shows the percentage of vehicles interviewed travelling between each sector for the hours included in the traffic modelling undertaken, ignoring pedal cycles, motorcycles, buses and minibuses. The traffic modelling assessed the hours of 08:00-09:00, an average of the hours between 10:00 and 16:00 and an

average of the hours between 16:00 and 18:00. The results indicate that over 70% of the traffic interviewed was travelling from Hastings to Bexhill.

Table 15.4: Roadside Interview Sector Analysis

Origin / Destination	Bexhill	Hastings	Northwest of Bexhill	Southwest of Bexhill	Northeast of Hastings	Southeast of Hastings
Bexhill		0.19%			0.31%	
Hastings	70.87%		6.49%	14.74%		
Northwest of Bexhill						
Southwest of Bexhill					0.09%	
Northeast of Hastings	4.65%			0.20%		
Southeast of Hastings	2.17%		0.20%	0.08%		

There is no summary of the number of properties affected by category under direct impacts on private property. Numbers of losses of industrial, commercial, residential properties etc should be outlined;

And

For commercial properties there should be an assessment of the number of people employed there on site and potential job losses, along with an assessment of the future viability of the business

15.5.23 A number of properties would be affected in Bexhill to facilitate development of the Scheme and its proposed new junctions with A259 Belle Hill and A269 London Road. Table 15.5 below summarises the number of properties directly affected:

Table 15.5: Summary of Properties Directly Affected

Category of Property	Total	Summarised Description
Industrial	0	NA
Commercial	13	companies in Sidley yards companies on London Road: 1 boarded up, 1 eatery, 1 depot 6 farm properties where portions of land are required 1 rural property where two barns have already been purchased
Residential	18	1 residential property where just land is required 17 residential property where land and a house including four which are boarded up
Other	6	1 area of land owned by East Sussex Fire and Rescue and used for driver training 1 school that is being relocated 4 pieces of land in Bexhill

15.5.24 ESCC supplied details regarding properties in December 2006 which were presented in Table 15B.17 in the ES. This information has been updated in February 2008 in greater detail with regards to employment impacts and business viability implications and is presented in Appendix L.3 Schedule of Directly Affected Properties from North to South for Bexhill Town and the Rural Area. The table also includes information about the rural properties that would be affected. The Scheme's effect and impacts on the rural properties and farm viability were examined in greater detail in Chapter 7: Agriculture and Forestry of the ES.

15.5.25 For the urban properties, there have been negotiations to purchase land and buildings using blight notices which have been served and accepted. Mitigations for a small number of the properties have not been fully identified. There are a small number of businesses with small labour forces that could be displaced. While job loss is always unfortunate, it must be kept in mind that the Regeneration Statement estimates that the proposed Scheme would potentially result in 1800 to 2000 jobs being created of which 950 are likely to go to local people living in deprived areas.

15.5.26 For the rural properties there would be no displacement of owners, residents or employees unless the private individuals decided the alternative land being offered is not adequate. Currently there is only one such property where this may potentially occur. Compulsory purchase orders have not been made for any of the properties and there have been no private treaty negotiations to purchase land required for the

Scheme. The overall assessment for impacts on private property is considered to be moderate adverse, as stated in the ES (Chapter 15 B, Section 15B.7.17).

15.6 IEMA Review

Given that no replacement land has been identified for the Crowhurst Shooting Club the assessment would have been more robust if the worst case had been assumed (i.e. no replacement land is provided) and the impact had been assessed as 'large adverse'.

15.6.1 The land under discussion here was formerly used as the northern abutment to the railway viaduct. It is within the Combe Haven SSSI and is currently used for clay pigeon shooting by the Crowhurst Shooting Club. The area believed to be used would be reduced in size as a result of the Scheme, and would be severed from its access from the north along the disused railway. The requirement for this land for the Scheme is for landscape and wildlife conservation purposes.

15.6.2 The location of this site is within the area of the proposed Pebsham Countryside Park within which is a presumption against gun sports. The scheme would remove the use for gun sports from the land.

15.6.3 The Highway Authority has held discussions with the land owner but to date there has been no success in arranging a formal meeting with club members. At this stage, it is unclear if formal legal arrangements exist between the land owner and the club, but it is clear that the activity has been taking place for some years. The Highway Authority is keen to establish a dialogue with the club, to explore whether the Authority can assist with a mitigation strategy. However, at this stage the Authority would propose to acquire the land as a part of the scheme and compensate the club and land owner appropriately. There are no proposals within the scheme to provide an alternative site for the shooting but it is considered that this is an activity which would be appropriate on private farmland and whilst no search for such land has been undertaken, it is clear that shooting of various types takes place on farms in the area.

Clarification should be provided on the basis for the conclusion in the final section of this chapter. If it is the result of a systematic evaluation then the method used should be described. If, however, it is simply the opinion of the assessor then this should be clearly stated, as a minimum, and preferably should be omitted from the ES.

15.6.4 The conclusion of Chapter 15B: Social and Community Effects is that the overall impact of the Scheme on the community is considered to be beneficial with moderate significance. IEMA asked for clarification of the basis for the conclusion, if it is the result of a systematic evaluation or the opinion of the assessor.

15.6.5 The overall significance has been determined according to the balance of significance scores of the predicted overall impacts of each community area for the

construction and operational phases of the Scheme. That is, whether the impacts are expected to be adverse or beneficial, and what level of significance is assigned to each. This information is presented in the main body of the chapter in Table 15B.13 for the construction phase and Table 15B.18 for the operational phase. Both tables attribute significance for social and community impacts (severance and accessibility), environmental impacts on well being of the community (noise, air quality and climate, landscape/townscape and visual amenity) and combines them into an overall impact on the community.

15.6.6 Table 15.6 below is newly derived. It takes the assessment results from the above mentioned Tables 15B.13 and 15B.18 and summarises the overall impacts on the community by significance attribution.

15.6.7 The methodology used to determine the overall significance of impacts is consistent with that explained and used to assess combined effects in Chapter 16 of the ES which draws upon the following sources of guidance:

- Highways Agency Interim Advice Note 81/06, DMRB Volume 11 Section 2 Part 5: Assessment and Management of Environmental Effects;

- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, Hyder May 1999, commissioned by the European Commission: Directorate-General XI (Environmental, Nuclear Safety and Civil Protection); and,

- Institute of Environmental Management & Assessment: Guidelines for Environmental Impact Assessment, IEMA 2004.

15.6.8 In Chapter 16, combined effects are defined as the interrelationship between impacts associated with the Scheme. Although minor effects are still worthy of note, only effects of moderate adverse or beneficial and above are considered significant.

15.6.9 Table 15.6 above illustrates that only two areas are expected to experience overall significant impacts (South St. Leonards and East Bexhill) and these are beneficial impacts in the operational phase and are therefore expected to be long-term or permanent. Two areas (North Bexhill and Crowhurst) are expected to experience slight to moderate adverse impacts in the construction phase.

15.6.10 Because there are two areas expected to experience overall beneficial significant impacts and no areas expected to suffer overall adverse significant impacts, the overall impact of the Scheme on the community is considered to be beneficial with moderate significance.

Table 15.6: Summary of Overall Community Impacts

Significance Attribution	Overall Construction Impacts		Overall Operational Impacts	
	Names of community areas	No. of community areas	Names of community areas	No. of community areas
Large beneficial				
Moderate - large beneficial				
Moderate beneficial			South St Leonards; East Bexhill	2
Slight to moderate beneficial				
Slight beneficial			Central Hastings; East Hastings; Battle; Crowhurst; Ninfield	5
Negligible to slight beneficial				
No effect or neutral (balanced) impacts	Central Hastings; East Hastings; Battle; Ninfield	4	North St Leonards	1
Negligible to slight adverse	South St Leonards; West Bexhill	2	North Bexhill West Bexhill	2
Slight adverse	North St Leonards; Central Bexhill; East Bexhill	3	Central Bexhill	1
Slight to moderate adverse	North Bexhill; Crowhurst	2		
Moderate adverse				
Moderate to large adverse				
Large Adverse				
Total no. of areas with beneficial significant impacts		0		2
Total no. of areas with adverse significant impacts		2		0

15.7 Conclusions

15.7.1 The severance significance criteria in the ES Chapter 15 A, 'Effects on Pedestrians, Cyclists and Recreational Users' and in Chapter 15B 'Social and Community Effects' have been developed taking into consideration DMRB guidance for both new severance and relief from existing severance. They differ from each other because the nature of severance impact is fundamentally different when dealing with recreational users as in Chapter 15A, as opposed to the broader impact of severance on communities as described in Chapter 15B. Severance in the community is generally an issue of practical everyday life and the walkers or cyclists involved are largely utility walkers or cyclists rather than people simply engaged in a recreational experience. DMRB Guidance does differ for recreation and community, for instance Section 4 of DMRB 'Changes in Amenity', the importance of landscape and townscape quality is stressed rather than just 'volume and composition of traffic' which are heavily stressed in the 'New Severance' guidelines as applied to communities.

15.7.2 The query regarding new severance and traffic flows is ambiguous and therefore has been considered with regards to:

- the community severance assessment of the new road; and
- presentation of the traffic levels behind the assessment.

15.7.3 Table 15B.1 in the ES outlines the categories of significance reflecting DMRB guidance for both new severance and relief from existing severance, for instance with references to hindrances. The new road would not have any pedestrian at-grade crossings. The new road does not have existing communities adjacent to the Scheme, other than the Bexhill Connection section. However this section would be aligned along the former railway line which is private land, not a designated open space and not an official thoroughfare. The results presented in Table 15B.14 of the ES represent the overall assessment of significance for new severance. The new road would also pass through open countryside and would affect a number of recreational paths. The severance effect on recreational users has been addressed in Chapter 15A of the ES.

15.7.4 The traffic levels between opening year 2010 with and without the Scheme were not presented explicitly in Chapter 15B but were depicted as percentages of change in Figure 15B.7 which is a direct output from the traffic model. Therefore, a new table within this Addendum to the ES (Table 15.6) presents the traffic level data for the 2010 'Do Nothing' and 'Do Something' scenarios.

15.7.5 Details and results of the road side survey data have been presented. The road side survey was undertaken in June 2005 on Crowhurst Road, southeast of the junction with Forewood Lane and Ballards Hill in the westbound direction between 07:00 and 19:00. A sample of 1116 vehicle drivers of 1327 vehicles (excluding pedal cycle and motor cycles) over the same 12 hour period were stopped and asked questions relating to the trip they were making that day.

15.7.6 A summary of affected properties is provided. Of the total 27 properties affected, none are industrial, 13 are commercial, 18 are residential and six are in the "other" category and are described in more detail in Section 15.5.23 above. This tally includes one boarded up company, four boarded up houses, and one rural property where two barns have already been purchased.

15.7.7 A revised schedule of directly affected properties is provided which details current employment, potential employment impact, and future viability of business. For the urban properties, there have been negotiations to purchase land and buildings using blight notices which have been served and accepted. Mitigations for a small number of the properties have not been fully identified. There are a small number of businesses with small labour forces that could be displaced. In contrary, the Regeneration Statement estimates that the proposed Scheme would potentially result in 1800 to 2000 jobs being created of which 950 are likely to go to local people living in deprived areas. For the rural properties there would be no displacement of owners, residents or employees unless the private individuals decided the alternative land being offered is not adequate. Currently there is only one such property where this may potentially occur. The overall assessment for impacts on private property is considered to be moderate adverse.

15.7.8 A review of the impact as a result of the Scheme on the Crowhurst Shooting Club has determined that the significance remains as moderate adverse as detailed in the ES. The land which is believed to be used for recreational shooting would be reduced in size as a result of the Scheme. The Highway Authority is keen to establish a dialogue with the club, to explore whether the Authority can assist with a mitigation strategy. At this stage the Authority would propose to acquire the land as a part of the scheme and compensate the club and land owner appropriately.

15.7.9 The methodology used to determine the overall significance of community impacts is consistent with that explained and used to assess combined effects in Chapter 16 of the Environmental Statement. It is based on recognised guidance. It considers that moderate and greater impacts are significant. Because there are two areas expected to experience overall beneficial significant impacts and no areas expected to suffer overall adverse significant impacts, the overall impact of the Scheme on the community is considered to be beneficial with moderate significance.

16 Combined and Cumulative Effects

16.1 Introduction

16.1.1 This chapter is written in response to the review of the ES by the Determining Authority, and an independent review by the external organisation IEMA.

16.1.2 No Regulation 19 issues have been put forward following the Determining Authority's review and relating to the Combined and Cumulative Effects Chapter of the ES. Therefore, no discussion will follow in this chapter under the Regulation 19 issues heading.

16.2 IEMA review

The independent IEMA review raised the query that:

"The ES provides a conclusion on the overall construction impact of the development. This would require a trade off between the different types of effects to reach this conclusion. As a minimum, the method for undertaking this should be described and the approach justified. However, as with the point made under Social and Community Effects, if the conclusion represents the opinion of the assessor then it should be clearly stated as being an opinion".

16.2.1 Conclusions for the Combined and Cumulative Effects chapter of the ES are divided into Combined Effects and Cumulative Effects, further sub divided into Construction Phase effects and Operational Phase effects.

16.2.2 The conclusions for the overall construction impact of the development state that:

"The Scheme would have an overall moderate adverse and significant environmental effect during the construction phase. The greatest effect would be upon the landscape resource within the Combe Haven valley, which would be highly significant due to a combination of impacts upon landscape character, the historic landscape and views from Public Rights of Way. Other environmental resources likely to be significantly affected during the construction phase would include land use, the built environment, the cultural heritage resource and non-motorised users including pedestrians and cyclists. Effects upon climate change, vehicle travellers, the water environment and the ecological resource of the study area would not be significantly affected by the Scheme during this phase".

And

"*The overall construction phase cumulative effects of the Scheme and the three other major schemes likely to be constructed at the same time would be moderate*

adverse and therefore significant. However, the majority of these effects would be temporary and would only occur over a limited two year period".

16.2.3 These statements solely represent the opinion of the Combined and Cumulative Effects assessor. The assessor's opinions are based entirely on the findings for each of the environmental topics as they have been presented within the ES, and from additional information contained in the BHLR Regeneration Statement and the BHLR Sustainability Statement (ESCC, 2007).

17 Conclusions

17.1 This Addendum to the Environmental Statement (ES) has been prepared for the proposed Bexhill to Hastings Scheme (BHLR) Scheme, promoted by East Sussex County Council (ESCC). The Addendum to the ES is prepared in compliance with Regulation 19 of The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999.

17.2 Under Regulation 19 of *the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999*, the Determining Authority is afforded the right to request further information and evidence respecting to Environmental Statements. The purpose of the Addendum to the ES is therefore to address these requirements for missing or additional environmental information from the ES, confirmed by the Determining Authority as being essential to the determination of the Planning Application for the Scheme.

17.3 These requirements are to known as Regulation 19 issues for the purpose of this Addendum.

17.4 The full spectrum of Regulation 19 issues have been addressed within this Addendum to the ES. The Addendum follows the same chapter structure as the ES. Each environmental topic contained within the ES has been included in the Addendum, with the relevant Regulation 19 issues identified and systematically addressed.

17.5 In addition, the ES was subject to an independent review by the Institute of Environmental Management and Assessment (IEMA). Following on from the Regulation 19 issues, each IEMA comment has been addressed within the relevant Environmental Topic chapter.

17.5.1 All supporting information is specifically referenced or contained within the Appendices to the Addendum.

17.6 Summary conclusions for each Environmental Topic chapter are presented below. They represent the conclusions in relation to the specific Regulation 19 issues and IEMA comments as detailed within each chapter. For full conclusions and detailed comments, please refer to the relevant chapter.

General:

17.6.1 Regulation 19 issues that have been raised as General Queries are addressed in this Chapter 4 of the Addendum to the ES. Additional information such as a full Contents page for the ES is included, and some formatting issues have been revisited.

17.6.2 Under the IEMA issues heading, additional and omitted information is also supplied. Figure 11.37 was omitted from the ES in error, and is subsequently included in this Addendum to the ES. In addition, the Scoping Opinion and Scoping Opinion Consultation documents are included at the request of the IEMA assessors.

Policy and Planning:

17.6.3 Chapter 5 Policy and Planning of this Addendum to the ES makes reference to the public consultation carried out in 2002 and 2004. This consultation is mentioned in Chapter 5 Policy and Planning of the ES, but additional detail has been required following the review by the Determining Authority.

17.6.4 Chapter 5 of this Addendum details the scope and methodology of both the 2002 and 2004 consultation. In 2002, public consultation was about the future of the communities of Hastings and Bexhill in the context of the Government's (then) recent announcements of major initiative for regenerating the area – the *Five Point Plan* billed as a *"new dawn"* for Hastings. The Scheme was one of a number of elements shown in the Masterplan that were subsequently developed and incorporated into the Task Force Business Plan in 2004.

17.6.5 The 2004 consultation involved a comprehensive public consultation element. A tabloid was circulated to 65000 addresses in Bexhill, Hastings and Crowhurst which detailed the options, sought views via a questionnaire and invited the public to attend an exhibition. An appraisal was then undertaken of seven options using the Government's New Approach to Appraisal (NATA) guidance. Based on the appraisal, the consultation results and further detailed discussions with the SEBs, ESCC's Cabinet agreed the Scheme to be taken forward as the preferred option.

Travel and Transport:

17.6.6 It is felt that the Regulation 19 Issues raised on the Travel and Transport chapter of the ES have been fully addressed in Chapter 6 of this Addendum to the ES. The Regulation 19 issues cover the assessment of junction capacities, clarification of figures provided, and clarification of the economic assessment reported.

17.6.7 The SATURN model used takes account of individual junction capacities. The assessment shows that the Scheme produces travel time benefits, some of which would occur at junctions within the study area.

17.6.8 Additional information and clarification of Figures has been provided. In addition, Issues raised as part of the IEMA review are also considered to be addressed within this chapter. The comments cover the assessment of the impact of construction traffic to clarify the assessment of "slight adverse". Table 6.5 of Chapter 6 also summarises the Security Indicators for Public Transport Passengers to give clarification of the security assessment for the Scheme.

Agriculture:

17.6.9 Chapter 7 of the Addendum to the ES has explained in further detail the difficulties in defining criteria relating to agricultural land quality, as well as how the areas of land loss relate to historical thresholds and current DEFRA statistical categories. This chapter has also considered the potential for agricultural reclamation on this site in terms of the different soil types encountered along the route and their particular physical characteristics and requirements for successful reclamation. The potential for successful reclamation is considered in terms of the different soil materials identified along the route, and the risk associated with each of these soil types.

Geology and Soils

17.6.10 Given the context of the site and the proposed end use, Chapter 8 Geology and Soils concludes that land contamination issues associated with the Scheme are unlikely to be significant. If present, the likely contamination sources are not unusual or complex and remediation techniques which are widely practised throughout the UK would be used to treat contaminated land.

Water Quality and Drainage:

17.6.11 Reference to the Flood Risk Assessment produced by Faber Maunsel (2008), is made within this Chapter of the Addendum to the ES to demonstrate evidence that the sequential approach and that the Exception Test have been applied. Details of the proposed Sustainable Drainage Systems (SUDS) are also included in the FRA, as well as figures to show flood outlines for the design event (100yr + 20%) for existing and post-road construction scenarios respectively.

17.6.12 The residual risks of flooding from tidal breach, overtopping, and the extreme fluvial flood (1 in 1000 yr) sources are all shown to be deemed as low. In addition, four different return periods for flooding have been inspected for the existing scenario. It is concluded that the impacts of the design condition (100yr + 20%) are virtually identical to those observed for the 20 yr, and 100 yr return periods, although the impacts of the extreme flood are significantly greater. The design condition can be considered representative of the impacts of flooding with lower but not higher return periods. The Assessment is therefore considered appropriate for all return periods up to the design (100 yr +20%) event.

Air Quality:

17.6.13 The Regulation 19 issue that relates to clarifying mitigation measures has been addressed. Mitigation measures have been provided to address potential air quality effects from the construction stage of the Scheme, and these measures are suitable for incorporation into a CEMP.

17.6.14 Specific issues raised by the IEMA review have also been addressed, in particular the query over Greenhouse Gas Emissions. The assessment in the ES stated that there would be an increase in CO_2 emissions of approximately 5.7% over the ten

year study period. This is a cumulative change. The actual change would be approximately 0.6% increase per annum, which is less than the projected nationwide increase in emissions over the same period. The assessment concluded that this was a reduction relative to the national projections and therefore would have a negligible effect on overall Greenhouse Gas Emissions.

Noise and Vibration:

17.6.15 Chapter 11, Noise and Vibration, focuses on addressing the raised issue of the omission of a night-time noise assessment from the ES. A worst case assessment of night time noise activities suggests that a total of 578 residential properties would be potentially affected by construction noise levels at night above the adopted criteria. However, the duration of the night-time activities generating the noise levels predicted is in most cases likely to be limited, in many cases to a single weekend and possibly a single night.

Nature Conservation and Biodiversity:

17.6.16 The key issues discussed in Chapter 12, Nature Conservation have shown that the proposed Scheme extends over the Marline Wood SSSI and that less than 30m² of the SSSI would be overshadowed by the proposed railway bridge structure.

17.6.17 Fragmentation of habitats has been shown to be of concern from the railway bridge over Marline Woods SSSI resulting in fragmentation of the woodland corridor, and from fragments of grazing marsh to the north of the proposed Scheme being isolated from the larger body of the valley to the south of the road within the Combe Haven SSSI. However, the effects of fragmentation would be compensated for by planting. Linkage of habitats would be provided beneath bridges to maintain connectivity, and linear habitat linkage would be created along the length of the Scheme.

17.6.18 The Scheme would cause an increase in nitrogen deposition within Combe Haven SSSI and Marline Valley Woods SSSI in 2010. However, all identified exceedences are predicted to occur with or without the proposed Scheme. It is likely that plant communities would succeed towards communities where nutrient demanding species dominate the communities present, although such succession may be currently occurring or already have occurred within the Scheme location.

17.6.19 Chapter 12 highlights that the impacts of salt spray are considered to be localised. However, there is a possibility that salt and other leachates would have a negative impact upon trout and lamprey nurseries in the Powdermill Stream. However, the water quality aim associated with the discharges from the Scheme would be to ensure that the existing water quality of the watercourse is maintained.

17.6.20 The assessment of impacts as a result of the Scheme on protected species of bats, dormouse and GCN, as well as breeding birds have been revisited, to provide additional information and clarity over mitigation.

17.6.21 Additional details of a comprehensive long-term landscape and wildlife management plan for a period of twenty years after Scheme completion have also been provided within this Chapter.

Landscape and Visual Effect:

17.6.22 The Landscape and Visual Effect Chapter 13 of this Addendum to the ES has aimed to provide fuller information about the design appearance of the scheme at the Bexhill / urban end of the proposed Scheme. This includes indications of the type of measures which the Highways Authority would like to discuss with the local community on London Road south. Revised and additional Figures have been provided for greater clarity and to provide further detail on engineered landforms incorporating The Greenway and interface between landform and noise fencing. A series of additional ZVI drawings have also been provided to assist in the understanding of the contribution which proposed landforms would have on minimising visual effects upon the countryside.

17.6.23 The Chapter details further commitments that have been made by the Highway Authority about how landscape and wildlife management proposals would be able to utilise ring fenced funding, generated by land within the scheme.

Cultural heritage:

17.6.24 Additional and outstanding surveys to inform the ES, required through the Regulation 19 appraisal, have been fully completed and are submitted as part of this Addendum. The additional information does not change the baseline assessment made in Chapter 14 of the ES, but does add extra detail to confirm and clarify the assessment. An outline WSI has also been produced to inform the approach for undertaking a full evaluation of the Scheme post-determination is also submitted.

Effects on Pedestrians, Cyclists and Recreation Users and Social and Community Effects:

17.6.25 Chapter 15, Effects on pedestrians, cyclists and recreation users and Social and Community Effects, gives an explanation for the differences in severance criteria between Chapter 15A ‘Effects on Pedestrians, Cyclists and Recreational Users’ and in Chapter 15B ‘Social and Community Effects’ of the ES. They differ from each other because the nature of severance impact is fundamentally different when dealing with recreational users, as opposed to the broader impact of severance on communities.

17.6.26 A new table within this Addendum to the ES has been produced to present the traffic level data for the 2010 ‘Do Nothing’ and ‘Do Something’ scenarios explicitly and clearly. In addition, details and results of the road side survey data have been presented, as well as a summary of the properties affected by the Scheme. A revised schedule of directly affected properties is provided which details current employment, potential employment impacts, and future viability of business.

17.6.27 There is no adjustment to the overall impact assessment of the Scheme on the community. The impact assessment is considered to be beneficial with moderate significance, as stated in the ES.

Combined and cumulative effects:

17.6.28 There are no Regulation 19 issues raised for Chapter 16 Combined and Cumulative Effects of the ES.

17.6.29 Chapter 16 in this Addendum to the ES does clarify the IEMA query that if the conclusions made in this chapter within the ES are solely representative of the opinion of the assessor, then it should be clearly stated as being an opinion. The conclusions are solely the opinion of the assessor. However, the assessor's opinions are founded on the assessment for each of the environmental topics as they have been presented within the ES.

17.7 Overall, this Addendum to the ES identifies no adjustment to the assessments made in the ES. The Addendum adds additional detail to support and clarify some aspects of the ES.

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Glossary and Abbreviations:

AADT: Annual Average Daily Traffic

Agricultural Landscape Classification (ALC): Provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system.

Ancient Woodland: Areas which have had continuous woodland cover since at least 1600 AD. An inventory of these woodlands in East and West Sussex was published by the Nature Conservancy Council (now English Nature) in 1989.

Ancient Semi-Natural Woodland: Ancient woodland sites that have retained the native tree and shrub cover that has not been planted, although it may have been managed by coppicing or felling and allowed to regenerate naturally.

Ancient Replanted Woodland: Ancient woodland sites where the original native tree cover has been felled and replaced by planting, usually with conifers and usually since 1900.

Annual Average Daily Traffic (AADT): the total volume of vehicle traffic in both directions of a highway or road for a year, divided by 365 days to give the AADT.

Air Pollution Information System (APIS): Provides a comprehensive source of information on air pollution and the effects on habitats and species; it has been developed in partnership with the UK conservation agencies, regulatory agencies and the Centre for Ecology and Hydrology.

AQA: UK Air Quality Archive.

Back-acter: A shovel that digs towards the back-acter machine (the digger), and is capable of digging below track level.

Biodiversity: The concept of variety in all species of plants and animals through which nature finds its balance.

BHLR: Bexhill to Hastings Link Road.

Biodiversity Action Plan: Plans that provide actions for targets for the conservation and enhancement of endangered and/or declining species and habitats. Can cover UK, regional or local areas: or the interests of the overseeing organisation**.**

CO2: Carbon Dioxide.

Construction Environmental Management Plan (CEMP): Describes the methodology for delivering a construction programme that aims to avoid, minimize or mitigate any adverse construction effects on the environment.

Chainage: A measure of distance from the Scheme origin ‘chainage 0’ along the centre line of the road. Expressed in metres and shown on Scheme drawings.

Cumulative Effects: The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.

dB(A): Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. A change of 3 dB(A) is the minimum perceptible under normal conditions and a change of 10 dB(A) corresponds roughly to doubling or halving the loudness of a sound.

Dead Ground: A discreet area within the visual envelope or Zone of Visual influence (ZVI) from where no views are available of the proposed development due to the screening effect of localised landform or landcover.

Decibel (dB): The logarithmic measure of sound level. 0 dB is the threshold of normal hearing. 140 dB(A) is the threshold of pain. A change of 1 dB is detectable only under laboratory conditions.

Department of the Environment, Food and Rural Affairs (DEFRA): Brings together environmental responsibilities from the former Ministry of Agriculture, Fisheries, and Food (MAFF) and the former Department of the Environment.

DMRB: Design Manual for Roads and Bridges.

EA: Environment Agency.

Ecology: All living things, such as trees, flowering plants, insects, birds and mammals, and the habitats in which they live.

Ecosystem: A biological community of interacting organisms and their physical environment.

EH: English Heritage.

Environmental Impact Assessment (EIA): The evaluation of the effects on the environment of particular development proposals.

Environmental Statement (ES): Report summarising the findings of an environmental impact assessment.

ESCC: East Sussex County Council.

FRA: Flood Risk Assessment.

Ghylls: Ghylls are very steep sided valleys incised by the headwaters of small streams. Because the slopes are too steep to cultivate they are often wooded. The High Weald is characterised by ghylls.

Groundwater: All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

Habitat: The place or environment where a plant or animal naturally or normally lives and grows.

IEMA: Institute of Environmental Management and Assessment.

Indirect Impacts: Impacts on the environment, which are not a direct result of the development but are often produced away from it or as a result of a complex pathway; sometimes referred to as secondary impacts.

MAFF: Ministry for Agriculture, Fisheries and Food.

NE: Natural England.

NOx: Oxides of Nitrogen.

NO2: Nitrogen Dioxide.

OA: Oxford Archaeology.

Polychlorinated biphenyls (**PCB**s): a class of organic compounds with 1 to 10 chlorine atoms attached to biphenyl.

Polycyclic aromatic hydrocarbons (PAHs): C that consist of fused aromatic rings, produced as byproducts of fuel burning. As a pollutant, they are of concern because some compounds have been identified as carcinogenic, mutagenic, and teratogenic.

PM10: Particles measuring 10µm or less.

ROW: Rights of Way.

SUDS: Sustainable Drainage Systems.

WebTag: Department for Transport's website for guidance on the conduct of transport studies.

WSI: Written Scheme of Investigation.

ZVI: Zone of Visual Influence.

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