

# Technical and Supporting Reports

June 2014



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## **Report for – Rother Valley Railway Limited** Track Reinstatement between Northbridge Street and Junction Road Environmental Statement – Volume 3 Technical and Supporting Reports Final

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## Document Version Control

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**Report for:** **David Slack**  
Rother Valley Railway Ltd

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## **Contents**

- 1) Scope and Methodology Report**
- 2) Scoping Opinion (Rother District Council)**
- 3) Ecology Phase 1 Habitat Survey (CLM)**
- 4) Flood Risk Assessment (Capita)**
- 5) Water Framework Directive Screening Assessment**
- 6) Contaminated Land Assessment (SLR)**

## **1) Scope and Methodology Report**

## REPORT for

Rother Valley Railway

# T2073 – Rother Valley Railway (Track reinstatement between Northbridge Street and Junction Road) EIA Scope and Methodology Report

Status: Final

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**23 October 2013**



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# T2073 – Rother Valley Railway (Track reinstatement between Northbridge Street and Junction Road) EIA

## Scope and Methodology Report

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### Report for:

Rother Valley Railway  
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## CONTENTS

1.	EIA SCOPING .....	11
1.1.	Introduction .....	11
1.2.	Scoping .....	11
2.	DESCRIPTION OF THE SCHEME .....	12
2.1.	Scheme Context .....	12
2.2.	Proposed Scheme .....	13
2.3.	Alternatives .....	15
3.	PROPOSED SCOPE OF THE EIA .....	16
3.1.	Introduction .....	16
3.2.	Environmental Topics to be assessed .....	16
3.3.	Additional Reports .....	16
3.4.	Approach and Methodology .....	16
3.5.	Consultation .....	20
4.	AIR QUALITY .....	21
4.1.	Introduction .....	21
4.2.	Current Baseline .....	21
4.3.	Potential Impacts .....	22
4.4.	Evaluation of Impacts .....	23
4.5.	Mitigation and Residual Effects .....	25
4.6.	Assumptions and Limitations .....	25
5.	ARCHAEOLOGY AND CULTURAL HERITAGE .....	26
5.1.	Introduction .....	26
5.2.	Current Baseline .....	26
5.3.	Potential Impacts .....	28
5.4.	Evaluation of Impacts .....	29
5.5.	Mitigation and Residual Effects .....	30
5.6.	Assumptions and Limitations .....	30
6.	SOCIO-ECONOMICS .....	31
6.1.	Introduction .....	31
6.2.	Current Baseline .....	31
6.3.	Potential Impacts .....	32
6.4.	Evaluation of Impacts .....	33
6.5.	Mitigation and Residual Effects .....	34
6.6.	Assumptions and Limitations .....	34
7.	ECOLOGY AND NATURE CONSERVATION .....	35



7.1.	Introduction.....	35
7.2.	Current Baseline .....	35
7.3.	Potential Impacts .....	38
7.4.	Evaluation of Impacts.....	38
7.5.	Mitigation and Residual Effects.....	41
7.6.	Assumptions and Limitations .....	41
8.	LAND QUALITY .....	43
8.1.	Introduction.....	43
8.2.	Scope of Work .....	44
9.	LAND USE AND AGRICULTURE .....	46
9.1.	Introduction.....	46
9.2.	Current Baseline .....	46
9.3.	Potential Impacts .....	47
9.4.	Evaluation of Impacts.....	47
9.5.	Mitigation and Residual Effects.....	49
9.6.	Assumptions and Limitations .....	49
10.	LANDSCAPE AND VISUAL IMPACTS.....	51
10.1.	Introduction.....	51
10.2.	Current Baseline .....	52
10.3.	Potential Impacts .....	54
10.4.	Evaluation of Impacts.....	54
10.5.	Mitigation and Residual Effects.....	55
10.6.	Assumptions and Limitations .....	55
11.	NOISE AND VIBRATION .....	57
11.1.	Introduction.....	57
11.2.	Current Baseline .....	57
11.3.	Potential Impacts .....	58
11.4.	Evaluation of Impacts.....	59
11.5.	Mitigation and Residual Effects.....	61
11.6.	Assumptions and Limitations .....	61
12.	TRANSPORT AND ACCESS .....	63
12.1.	Introduction.....	63
12.2.	Current Baseline .....	63
12.3.	Potential Impacts .....	64
12.4.	Evaluation of Impacts.....	65
12.5.	Mitigation and Residual Effects.....	65
12.6.	Assumptions and Limitations .....	66



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13.	WATER QUALITY, HYDROLOGY AND HYDROGEOLOGY .....	67
13.1.	Overview.....	67
13.2.	Current Baseline .....	67
13.3.	Potential Impacts .....	69
13.4.	Evaluation of Impacts.....	71
13.5.	Mitigation and Residual Effects .....	73
13.6.	Assumptions and Limitations .....	73

# APPENDICES

APPENDIX 1	Figures.....	75
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## ABBREVIATIONS

<b>AADT</b>	Annual Average Daily Traffic
<b>ALC</b>	Agricultural Land Classification
<b>AONB</b>	Area of Outstanding Natural Beauty
<b>BAP</b>	Biodiversity Action Plan
<b>BPM</b>	Best Practicable Means
<b>BS</b>	British Standard
<b>BRE</b>	Building Research Establishment
<b>CEMP</b>	Construction Environmental Management Plan
<b>CTRN</b>	Calculation of Road Traffic Noise
<b>DCLG</b>	Department for Communities and Local Government
<b>DEFRA</b>	Department for Environment, Food and Rural Affairs
<b>DfT</b>	Department for Transport
<b>DMRB</b>	Design Manual for Roads and Bridges
<b>EcMP</b>	Ecology Management Plan
<b>EIA</b>	Environmental Impact Assessment
<b>EPUK</b>	Environmental Protection United Kingdom
<b>ES</b>	Environmental Statement
<b>EU</b>	European Union
<b>FRA</b>	Flood Risk Assessment
<b>GLVIA</b>	Guidelines for Landscape and Visual Impact Assessment
<b>HDV</b>	Heavy Duty Vehicle
<b>IEEM</b>	Institute of Ecology and Environmental Management
<b>LAQM.TG</b>	Local Air Quality Management Technical Guidance
<b>MAFF</b>	Ministry for Agriculture, Fisheries and Food
<b>MMU</b>	Manchester Metropolitan University
<b>NAQO</b>	National Air Quality Objective
<b>NIRR</b>	Noise Insulation (Railways) Regulations
<b>NPPF</b>	National Planning Policy Framework
<b>ONS</b>	Office for National Statistics
<b>OS</b>	Ordnance Survey
<b>PLQRA</b>	Preliminary Land Quality Risk Assessment
<b>PPL</b>	Potential Pollution Linkages
<b>PPS</b>	Planning Policy Statement
<b>SNCI</b>	Site of Nature Conservation Interest
<b>SSSI</b>	Site of Special Scientific Interest



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<b>SxBRC</b>	Sussex Biological Records Centre
<b>TSR&amp;GD</b>	Traffic Signs Regulation & General Directions
<b>WFD</b>	Water Framework Directive
<b>ZTV</b>	Zone of Theoretical Visibility



## GLOSSARY

<b>A</b>	
aquifer	A porous body of rock capable of holding quantities of water that can be abstracted for human use.
arable	Land use for growing crops.
at-grade	At ground level.
<b>B</b>	
ballasted	Stone material which forms the trackbed of a railway line.
baseline	Information which represents the environmental conditions immediately prior to the implementation of any scheme. Environmental impacts or benefits are assessed by measuring how much the baseline conditions would change.
Biodiversity Action Plan	A program to maintain or restore habitats and species.
<b>C</b>	
cartographic	Pertaining to maps.
catchment	An area of land that drains in to a single watercourse.
<b>D</b>	
desk based assessment	A study undertaken utilising available data sources only and not based on original site derived information.
<b>E</b>	
Environmental Impact Assessment	A formal process which assesses the potential environmental effects of a project.
Environmental Statement	Document in which the results of an EIA are presented to decision-makers and the public.
<b>F</b>	
floodplain	Flat or nearly flat land adjacent a stream or river that stretches from the banks of its channel to the base of the enclosing valley walls and experiences flooding during periods of high discharge.
fluvial	The processes associated with rivers and streams and the deposits and landforms created by them.
forge	A furnace where metal is heated.
fugitive dust	Dust that becomes airborne.
<b>G</b>	
grade separated	On different vertical plains.
groundwater	Water held in the ground.
<b>H</b>	
halt	Minor stopping place on a railway.
hydrology	The study of surface water.
hydrogeology	The study of groundwater.
<b>I</b>	
infiltration	Process of water entering the soil.
<b>K</b>	
kiln	A type of oven used to process a substance by burning, firing or drying.
<b>M</b>	
medieval period	The period in European history often dated from between a.d. 476 and 1453.
mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for adverse effects of a development project.
<b>N</b>	
nucleated settlements	A settlement established around a central point.
<b>P</b>	
pastoral	Land used for the grazing of animals.



public right of way	A path that members of the public have a protected legal right to walk along. Depending on the type of public right of way, it may also be available for cycling, horse riding, horse drawn carriages and motor vehicles.
<b>R</b>	
receptor	In general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property or a water body.
riparian	Adjacent to a river.
<b>S</b>	
scheduled monument	A nationally important monument afforded legal protection.
scoping opinion	A report provided by a determining authority which defines the requested content of an EIA.
soakaway	Defined area established to drain water into the ground.
soffit	Underside of a bridge.
spatial scope	To define the physical extent of a study area.
statutory consultee	An individual or organisation that there is a legal obligation to consult with.
sustainable drainage system	Infrastructure which manages surface water in a manner that considers water quality, flooding and amenity.
<b>T</b>	
temporal scope	The definition of the time scales which an assessment would be undertaken.
topographic	Pertaining to the shape and physical features of the earth's surface.
transboundary	Something that crosses an international boundary.
tributary	A stream that feeds into a larger watercourse.



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## EXECUTIVE SUMMARY

This report is written to support a request to Rother District Council for a formal scoping opinion under Part 4, Regulation 13 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 with regards to the scope and methodology for the EIA and the content of the Environmental Statement (ES).

The report describes the proposed approach to the Environmental Impact Assessment (EIA) for the proposed Rother Valley Railway Project. The project would reinstate approximately 3.4km of the former Kent and East Sussex Railway between the B2244 Junction Road in the east and Northbridge Street in Robertsbridge to the west.

The report has been prepared to allow statutory consultees the opportunity to review the proposed methodology in advance of the assessment to ensure satisfactory compliance with procedure and appropriate coverage of environmental issues deemed relevant to the project.

In summary the Scope and Methodology Report:

- Sets out the overall approach to the EIA;
- Identifies the environmental topics to be assessed;
- Identifies any topics that do not need to be assessed i.e. can be “scoped out”;
- Defines the technical, spatial and temporal scope of individual assessments;
- Defines the methodologies to be used in the topic assessments including baseline studies;
- Details out the methodology for predicting environmental impacts and evaluating their significance; and
- Sets out the general approach for incorporating mitigation into the development, whether it is through modifications to the design or the addition of other environmental/sustainability measures.

The proposed topics to be assessed in the EIA are:

- Air Quality;
- Archaeology and Cultural Heritage;
- Socio-economics;
- Ecology and Nature Conservation;
- Land Quality;
- Land Use and Agriculture;
- Landscape and Visual Impacts;
- Noise and Vibration;
- Transport and Access; and
- Water Quality, Hydrology and Hydrogeology.



# 1. EIA SCOPING

## 1.1. Introduction

- 1.1.1. Temple has been commissioned by Rother Valley Railway Limited (RVR) to carry out an Environmental Impact Assessment (EIA) of the proposed Rother Valley Railway Project (hereafter referred to as “the Scheme”).
- 1.1.2. The proposed Scheme would reinstate approximately 3.4km of the former Kent and East Sussex Railway between the B2244 Junction Road in the east and Northbridge Street in Robertsbridge to the west. A more detailed description of the Scheme is provided in **Chapter 2**.
- 1.1.3. The purpose of this report is to support a request to Rother District Council for a formal scoping opinion under Part 4, Regulation 13 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (the ‘Regulations’) with regards to the scope and methodology for the EIA and the content of the Environmental Statement (ES). As specified in the Regulations this report provides a brief description of the nature and purpose of the development and its possible effects on the environment. Town and Country Planning consent will be sought from Rother District Council to allow the Scheme to be constructed.

## 1.2. Scoping

- 1.2.1. This Scope and Methodology Report describes how the EIA of the Scheme will be undertaken. The scope encompasses the topics (described in sections 4-13) that will be assessed and the temporal and spatial scope within which they will be considered. The report also sets out an overview of the methods that are intended to be used in the EIA to determine the potential significant temporary and permanent, direct and indirect environmental effects that would arise as a consequence of the Scheme’s construction and operation.
- 1.2.2. This Scope and Methodology Report:
  - sets out the overall approach to the EIA;
  - identifies the environmental topics to be assessed;
  - identifies any topics that do not need to be assessed i.e. can be “scoped out”;
  - defines the technical, spatial and temporal scope of individual assessments;
  - defines the methodologies to be used in the topic assessments including baseline studies;
  - sets out the methodology for predicting environmental impacts and evaluating their significance; and
  - sets out the general approach for incorporating mitigation into the development, whether it is through modifications to the design or the addition of other environmental/sustainability measures.

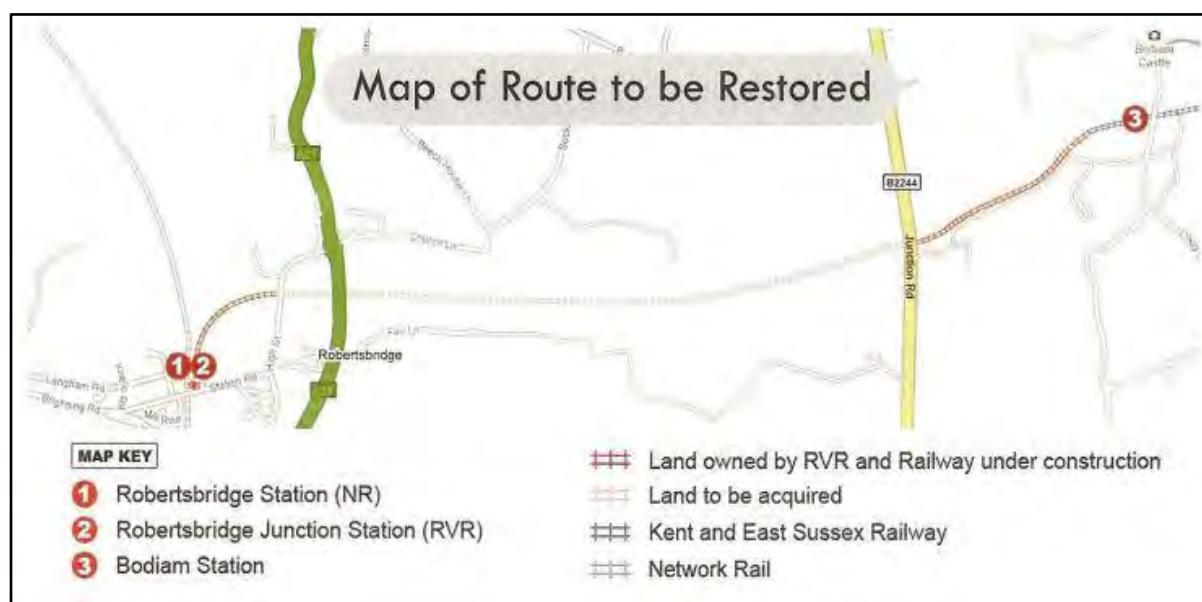


## 2. DESCRIPTION OF THE SCHEME

### 2.1. Scheme Context

- 2.1.1. The Scheme would seek to reconstruct an approximately 3.4km length of the former Kent and East Sussex Railway (see **Plate 2.1**). The missing section of line would connect an existing operational section of railway that runs from Tenterden in the east to the B2244 Junction Road and a short section of line between Robertsbridge Train Station and Northbridge Street in Robertsbridge.

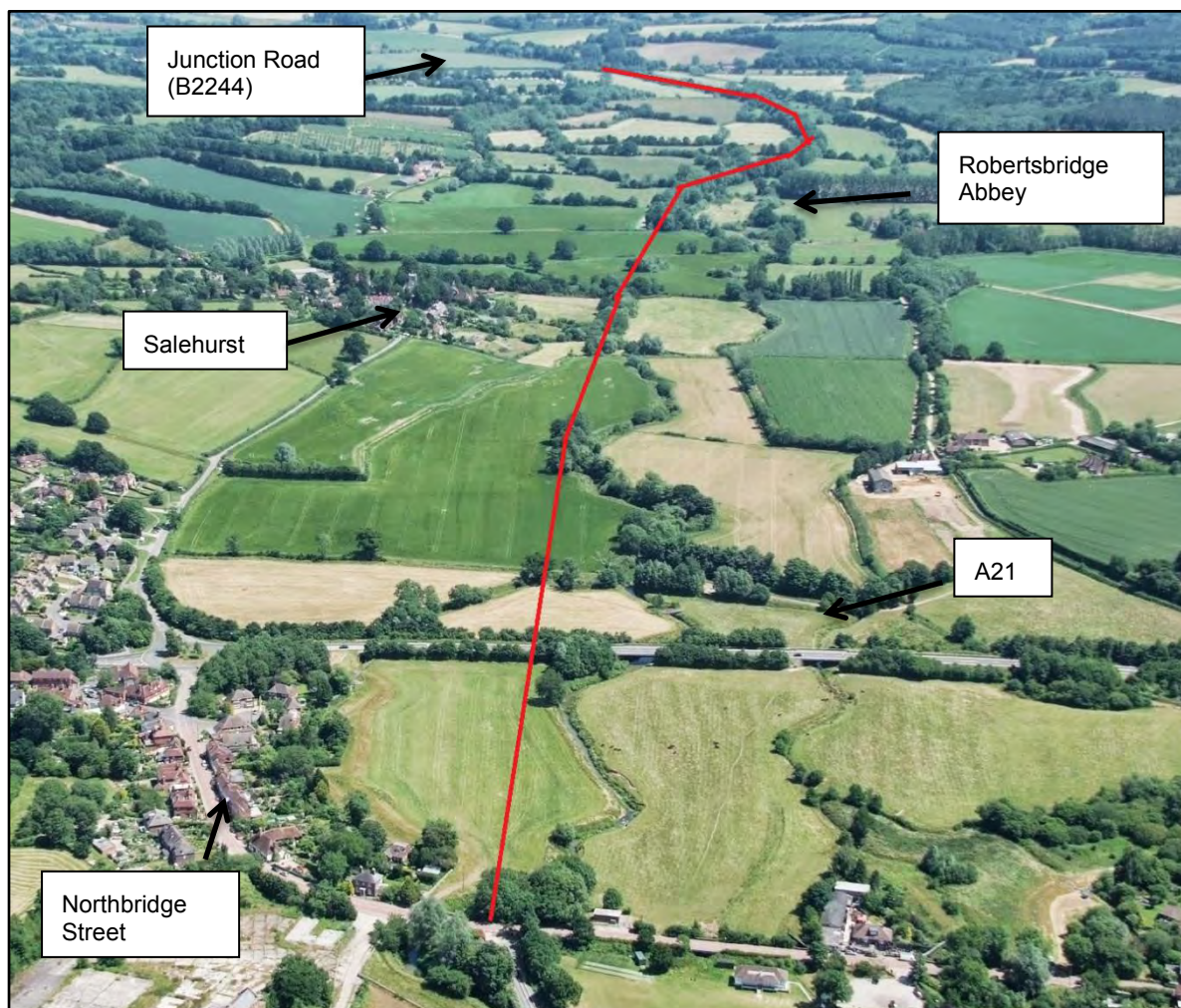
**Plate 2.1 – Plan Showing Section of The Route to be restored**



- 2.1.2. The original line was known as the Rother Valley (Light) Railway and was granted consent by an Act of Parliament in 1896 and opened in 1900. The line was subsequently renamed the Kent and East Sussex Light Railway in 1904. The railway closed to regular passenger services in 1954 and freight services in 1961. Following the closure of the line, the Kent and East Sussex Railway Preservation Society was formed and purchased part of the line between Tenterden and Bodiam. Trains began to run again in 1974 and the section of purchased line was gradually restored and extended in stages reaching Bodiam in 2000.
- 2.1.3. To the west, the section of line from the terminus at Robertsbridge to Northbridge Street in Robertsbridge and in the east from Bodiam to the B2244 Junction Road was granted planning permission for reinstatement in 2005 (Application Number: RR/2005/836/P). This work included the construction of replacement bridge structures and was completed in 2012. Planning consent for a new railway station, signal box, water crane and tower, carriage shed and engine shed adjacent to the existing national rail station at Robertsbridge was granted by Rother District Council in November 2012 (Application Number: RR/2012/1357/P) and is currently under construction (initial work involving track laying and platform construction were completed in September 2013). Once fully completed the Scheme would allow trains to run the full length of the line between Robertsbridge and Tenterden and provide a connection to the Network Rail network to enable visitors to the Kent and East Sussex Railway to arrive by train (at present it is only accessible via the highway network).



**Plate 2.2 – Aerial Photo Looking East Showing the Railway Alignment**



## 2.2. Proposed Scheme

### Site Location

- 2.2.1. The location of the proposed Scheme extends from Grid Reference 578305, 124995 to 573377, 123488 (see Appendix 1). The site is located between Northbridge Street, Robertsbridge and Junction Road near Bodiam in East Sussex, covering a distance of approximately 3.4km. The entire line of route lies within the High Weald Area of Outstanding Natural Beauty (AONB).
- 2.2.2. The surrounding area is predominately a mixture of arable and pastoral agricultural land, with areas of woodland south of the proposed route. Residential areas within the vicinity of the scheme include Salehurst, Northbridge Street and Robertsbridge, which are all located at the westerly end of the proposed route, and Bodiam to the most easterly point.
- 2.2.3. The site includes one watercourse, the River Rother, which flows northwest to southeast and runs broadly parallel with the proposed route, crossing just north of Fowlbrook Wood near the eastern end of the site and again just north of Robertsbridge at the westerly end of the site.



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## Description of the Scheme

- 2.2.4. The proposed Scheme comprises of the construction of new railway line together with associated infrastructure.
- 2.2.5. The key element of the Scheme will be the construction of approximately 3.4km of single track ballasted railway line on the alignment of the former railway between Northbridge Street, Robertsbridge and the B2244 Junction Road near Bodiam. The section of track is the “missing link” that will enable trains on the Kent and East Sussex Railway to run the full distance between Tenterden in Kent to Robertsbridge in East Sussex (approximately 20km). Approximately 2km of the former railway corridor is still largely intact as delineated in the landscape by trees bounding the alignment (see **Plate 2.2**). The remainder of the route has been reclaimed as agricultural land.
- 2.2.6. The Scheme will comprise of the following:
- 3.4km of new track;
  - three at-grade full carriageway level crossings on Northbridge Street, the A21 and the B2244 Junction Road;
  - a new halt serving the village of Salehurst;
  - two bridges and one causeway crossing the River Rother; and
  - operational track infrastructure (e.g. signalling).
- 2.2.7. The three highway level crossings would have locally monitored and controlled barriers and would be formed of precast concrete slabs with embedded rail. On the A21 crossing it is intended to extend the existing 40mph speed limit southwards from the roundabout to beyond the level-crossing. All crossings would have new road signs and road markings in accordance with the requirements of the Traffic Signs Regulations and General Directions (TSR&GD) and the Traffic Signs Manual standards and/or the guidance document “Level Crossings: a Guide for Managers, Designers and Operators – Rail Publication 7 (December 2011)”. In addition there will be one bridleway crossing and one footpath crossing of the railway.

## Scheme Operation

- 2.2.8. The Scheme once complete would allow a service to operate between Tenterden and Robertsbridge. The existing Kent and East Sussex Railway timetable has been used as a basis for the assumed operational timetable as it is not proposed to significantly alter the intensity of service from that provided at present. As such, the operational timetable of the Scheme would vary significantly throughout the year (the railway would operate on a single day in January; but in the peak month of August the railway would operate every day). The number of services (i.e. train movements) would also vary on a seasonal basis. In general, between April and October, on days when the railway is operational, there would be five return journeys each day. Exceptions to this are occasions when there would be eight return services a day, which are limited to fewer than ten days in a year and usually coincident with, but not limited to, bank holiday weekends.
- 2.2.9. In addition to the timetabled services the railway is also used for private charters and as a film location. In general these additional train movements would not coincide with the most intensive use of the railway and as such it is not anticipated that the railway would exceed ten return journeys in a day during normal operation. The journeys would be provided by a



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combination of steam and heritage diesel locomotives. The timetabled services can be summarised as follows:

- 9 days a year – 8 return journeys a day;
- 9 days a year – 7 return journeys a day;
- 128 days a year – 5 return journeys a day;
- 14 days a year – 4 return journeys a day; and
- 192 days a year – no timetabled service<sup>1</sup>.

2.2.10. The timetabled service would usually operate between 10:00 and 18:00. However, the railway proposes to extend the current evening diner service that currently operates weekly on the Kent and East Sussex Railway through to Robertsbridge. This service would finish at 23:00.

## 2.3. Alternatives

2.3.1. The EIA is required to assess alternatives to the proposed Scheme where these have been considered. In this instance, the aspiration of RVR is to reinstate the former railway alignment and as such options for the location and proposed alignment are limited. However, options to create a grade separation of the A21 crossing have been considered. The investigation of crossing options identified that for a range of technical reasons a level-crossing presented the most practical solution. Constraints to a grade-separated crossing included;

- The creation of unacceptably steep track gradients from a safety perspective either side of the A21 to pass over or under the highway,
- An under bridge would put the railway track under the A21 much lower than the adjacent river. In addition, flooding of the underbridge option would be inevitable and was predicted to occur several times during the course of a year. These events would lead to a deposit of silt and collection of debris along the railway line which would require removal prior to the line re-opening and cause train safety/adhesion risks; and
- Creation of landscape impacts from significant cuttings or embankments and additional permanent land take requirements.

2.3.2. The ES will describe any alternatives considered in detail and provide a full explanation as to why options have or have not been included in the Scheme, with particular reference to the environmental effects of each.

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<sup>1</sup> Although private chartered trains may still operate on these days.



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## 3. PROPOSED SCOPE OF THE EIA

### 3.1. Introduction

- 3.1.1. This section provides an overview of the topics that will be addressed by the EIA, as well as the geographical area and timeframe within which potential impacts are considered likely to occur. The broad approach to mitigation is set out with further details, as appropriate, being provided in the individual topic sections of this report.

### 3.2. Environmental Topics to be assessed

- 3.2.1. In assessing the temporary and permanent environmental effects, the EIA will assess impacts (both beneficial and adverse) on:
- air quality;
  - archaeology and cultural heritage;
  - socio-economics;
  - ecology and nature conservation;
  - land quality;
  - land use and agriculture;
  - landscape and visual amenity;
  - noise and vibration;
  - transport and access; and
  - water quality, hydrology and hydrogeology.

### 3.3. Additional Reports

- 3.3.1. In addition to the Environmental Statement, the following documents would be provided to support the planning submission but would not form part of the ES:
- A Flood Risk Assessment compliant with the guidelines set out in the National Planning Policy Framework (NPPF)<sup>2</sup> and the Technical Guidance to the NPPF<sup>3</sup>;
  - A Preliminary Water Framework Directive (WFD) assessment; and
  - A Draft Construction Environmental Management Plan (CEMP) to capture the mitigation identified in the ES and form a management structure to ensure their implementation during the construction and where necessary for a period post-construction.

### 3.4. Approach and Methodology

- 3.4.1. The following section describes the generic approach to EIA (as shown on the flow chart in **Plate 3.1**). Each topic will have slightly different methodologies specific to their area of study, however, they will all follow the broad principals described in this chapter.

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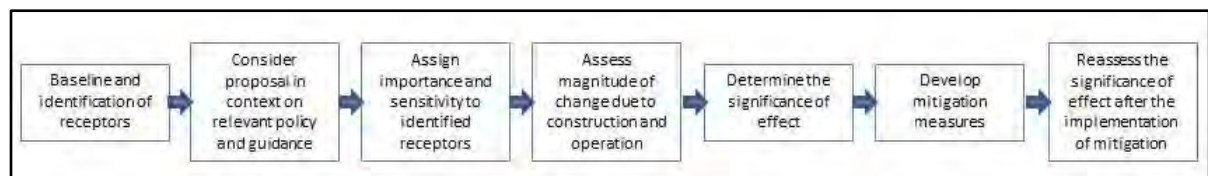
<sup>2</sup> Communities and Local Government (March 2012) National Planning Policy Framework

<sup>3</sup> Communities and Local Government (March 2012) Technical Guidance to the National Planning Policy Framework



- 3.4.2. The first stage is to identify the baseline conditions which would reasonably be expected to exist at the Site immediately prior to the commencement of construction, and also to identify any sensitive receptors.
- 3.4.3. The second stage is to consider the Scheme in the context of national, regional and local planning policy and guidance to identify any conflicts with the Scheme design and location.
- 3.4.4. It is necessary to evaluate the sensitivity and importance of the identified receptors. The receptor's likelihood of being affected by any changes caused by the Scheme and the importance of the receptor will dictate the predicted final severity of effect. Each discipline will use best practice methods to assign sensitivity and importance to relevant receptors.
- 3.4.5. The magnitude of change that the Scheme would cause will be assessed for both the construction and operational phase of the project. This assessment will be undertaken in the context of the date when construction would occur and when the Scheme would become operational, as the baseline may change during this period, without any influence from the Scheme. From this it will be possible to determine the likely significance of an effect on a receptor.
- 3.4.6. The aim of the EIA process is to avoid or reduce the significance of an effect once it has been identified. This is achieved through the development of mitigation measures. Once mitigation is developed the significance of the effect is reassessed to identify whether the effects of the impact (**see 3.4.15**) have been fully mitigated. Any impact that cannot be mitigated, such that the effects are no longer deemed significant, is described as a residual effect. A residual effect is one that is predicted to occur as a result of the construction or operation of the Scheme.

#### Plate 3.1 – EIA Process Flow Chart



#### Spatial Scope

- 3.4.7. The spatial extent of the assessments will be individually defined for each environmental topic, according to the physical extent of the potential impacts relevant to that topic, or of the information required to assess those impacts. Where practicable the spatial scope will be agreed with statutory consultees relevant to that topic.
- 3.4.8. Given the nature and limited physical footprint of the Scheme, there are no anticipated impacts on any international or wider political boundaries. As a result, it is considered appropriate to scope out transboundary effects from the EIA.

#### Temporal Scope

- 3.4.9. The baseline conditions represent the pre-existing environment immediately prior to an impact occurring. Impacts could be as a result of construction or operation of the Scheme. Any change is measured against the baseline in order to assess the magnitude of impact.
- 3.4.10. The ES will describe impacts on the basis of their temporal duration (i.e. temporary or permanent).



- 3.4.11. Identification of baseline conditions must take into account predicted changes that would occur prior to the construction or opening of the proposed Scheme, and that are entirely independent of it. Such examples include changes in forecast traffic growth, air quality and land use. Identification of the baseline therefore involves two stages of work:
- Identification of the existing baseline (2013); and
  - Determining how likely the existing baseline is to change before the implementation of the Scheme (2016).
- 3.4.12. For impacts that would be caused by the operation of the Scheme, the opening year and a design year 15 years after the Scheme becomes operational would be used. The 15 year period accounts for the time some mitigation proposals may require to become fully effective, which is particularly relevant for landscape and ecology. The most obvious example is the period of time required for compensatory vegetation planting to become established. The design year for the project is 2031.
- 3.4.13. It is usual for an EIA to also include consideration of the decommissioning phase of a development. The former line of route has already been decommissioned once, when it was closed in the 1960s. Early assessment of the site has not indicated any significant effects as a result of that original decommissioning and as such it has been assumed this would still hold true for any future decommissioning scenario. The new track will be constructed using modern materials and techniques so it is expected that the Scheme will have a design life of 30 years and bridge structures 100 years. Sections of track may be replaced from time to time as part of the on-going maintenance of the railway. In the event that the line was decommissioned it is anticipated that it would be possible to dismantle structures and re-use/recycle all materials. Therefore, the EIA will focus on the impacts and effects associated with the construction and operational phases only.

## Limitations

- 3.4.14. Each topic assessment will make clear the presence of any limitations and provide a narrative as to how the limitation may have affected the assessment. It is proposed that limitations identified (e.g. restricted land access) would be considered in the assessment and methodologies adapted where possible (e.g. taking a worse-case or precautionary approach to baseline data) to ensure that a conclusion can be made and that the findings of the assessment would be sufficiently robust as to be not adversely affected by the identified limitation.

## Identifying Potential Impacts- Direct, Indirect and Cumulative

- 3.4.15. The ES will define the impact as the change experienced as a result of the Scheme and the effect as the consequence of that change (e.g. the loss of ancient woodland would be an impact; the depletion of a scarce resource would be the effect).
- 3.4.16. Direct effects are those effects where the Scheme causes an impact or change experienced by a receptor as a result of a single primary act, for example, construction of new infrastructure changing the appearance of the landscape.
- 3.4.17. Indirect effects are those effects that are not a direct result of the Scheme, but are the result of two or more stages of change resulting from a single original effect. An example of an indirect effect could be if a scheme affects groundwater levels, changing the water level of a nearby wetland, which in turn has an adverse effect on the ecology of that wetland. The Scheme would not directly affect the ecology of the wetland, but by affecting groundwater would indirectly affect the ecology of that location.



- 3.4.18. Assessments will be undertaken on the basis of the most likely design and assume the worst case scenario in terms of environmental impacts where appropriate. The assessments will consider construction, operation and maintenance of the Scheme. As previously discussed decommissioning will not be included in the assessment.
- 3.4.19. Cumulative effect is defined as "both the combined effects of different development activities within the vicinity of the Scheme and those different aspects of a single development on a particular receptor"<sup>4</sup>. As such these effects are defined as intra- and inter-project effects. At this stage no other projects have been identified as requiring consideration in combination with this proposed project in terms of likely significant inter-project environmental effects. Nevertheless, we invite the local planning authority to identify any committed or consented projects they believe are likely to require consideration within the EIA as a result of likely significant inter-project environmental effects
- 3.4.20. A generic significance matrix will be provided in the overarching EIA methodology chapter. Where a topic methodology does not have a specific assessment matrix they will use the matrix provided below. An effect is deemed to be significant when it is assessed as being moderate, large or very large. This definition of a significant effect differs for some topic assessment methodologies; where this is the case it will be stated in the relevant topic chapter.

**Table 3.1 - Significance Matrix**

	Magnitude of Impact				
Value/ Sensitivity	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate	Large	Very Large
High	Neutral	Slight	Slight	Moderate	Large
Medium	Neutral	Neutral	Slight	Slight	Moderate
Low	Neutral	Neutral	Neutral	Slight	Slight
Negligible	Neutral	Neutral	Neutral	Neutral	Slight

### Mitigation Measures, Enhancements and Residual Effects

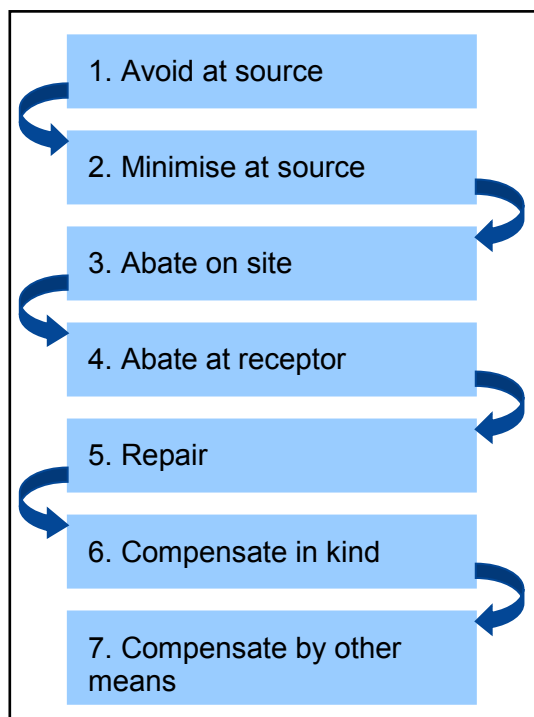
- 3.4.21. Mitigation measures will be identified for the purposes of making a significant effect non-significant. Only mitigation measures that are committed to by the Scheme and that are deliverable will be assessed for their effectiveness to reduce significant adverse effects.
- 3.4.22. Mitigation measures described in the ES will be included in the proposed Scheme design and draft Construction Environmental Management Plan (CEMP). The draft CEMP will describe the methods and management structure implemented by the Scheme to ensure the incorporation of mitigation identified in the ES in the Scheme construction/ detailed design. The CEMP is described as draft as it is a working document that would be adopted and update as necessary by the contractor for the purposes of the construction phase.

<sup>4</sup> Department for Communities and Local Government (2006) Environmental Impact Assessment: A guide to good practice and procedures



- 3.4.23. The principle of the mitigation hierarchy will be used (**Plate 3.2**) to manage predicted effects. The hierarchy sets out the mitigation options in order of preference. A significant adverse effect which still exists after the implementation of mitigation is described as a residual effect. Where residual effects are present, these should be identified for each discipline and the significance of that residual effect assessed.

**Plate 3.2 - Mitigation Hierarchy**



### 3.5. Consultation

- 3.5.1. A description of the consultation undertaken will be provided as a summary for the whole Scheme and under each topic chapter.
- 3.5.2. The consultation section will indicate which comments have been taken into account in the assessment and how. Where a comment has not been actioned, the rationale for this decision will also be explained.



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## 4. AIR QUALITY

### 4.1. Introduction

- 4.1.1. This section describes the scope and proposed methodology for the assessment of effects on air quality that potentially may result from the construction and operational phases of the Scheme.
- 4.1.2. In undertaking the air quality assessment, consideration will be given to the policies and plan adopted by the relevant authorities and both governmental and regulatory bodies. These comprise:
- National Air Quality Strategy (Defra);
  - Environmental Protection UK (EPUK) Guidance on Development Control: Planning for Air Quality (2010 Update);
  - BRE: Control of Dust from Construction and Demolition Activity, V Kukadia, S Upton, D Hall, March 2003;
  - GLA's Control of dust and emissions from construction and demolition - Best Practice Guidance;
  - Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Mineral Extraction in England - Annex 1: Dust;
  - Rother District Council Environmental Impact – Information Requirements; and
  - Supplementary Planning Guidance.
- 4.1.3. The air quality assessment will consider a number of sensitive receptors that could potentially be affected by air pollution associated with the Scheme. Receptors comprise places where it would be reasonable to expect people to be exposed to ambient air quality which is likely to change as a result of the Scheme. They include:
- Dwellings and other premises used for residential purposes;
  - Users of communal open spaces;
  - Industrial or commercial uses sensitive to dust (including food businesses); and
  - Ecological receptors.

### 4.2. Current Baseline

- 4.2.1. As part of this scoping assessment, a review of the available existing information on local air quality conditions has been undertaken. Where appropriate, the information contained in this document has been used to inform the proposed assessment methodology, including the likely sensitive receptor locations and potential impacts.
- 4.2.2. Since 1997 local authorities in the UK have been carrying out a recurring review and assessment process with respect to air quality in their areas. This process follows a phased approach, whereby local authorities only undertake a level of assessment that is commensurate with the risk of a National Air Quality Objective (NAQO) being exceeded. The aim of this review process is to assess whether the NAQOs are likely to be achieved.



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- 4.2.3. Where the initial assessment identifies a risk that an air quality objective has been exceeded at a location with relevant public exposure, the authority is required to undertake a detailed assessment following Defra's Local Air Quality Management Technical Guidance LAQM.TG (09). The aim of the detailed assessment is to identify with reasonable certainty whether or not an exceedance of the NAQOs is likely to occur. The detailed information incorporated within Rother District Council's air quality review and assessment documents will, in part, be used to inform the air quality assessment for the Scheme.
- 4.2.4. Rother District Council completed its third round of Air Quality Updating and Screening Assessments in 2006, which confirmed that all of the National Air Quality Objectives would be met across the district.
- 4.2.5. A preliminary review of the likely construction traffic will be carried out and the proposed haul routes to and from the site will also be examined. A desk based assessment will be carried out to establish the current air quality conditions in the vicinity of Rother District, using recent monitoring data and background air quality maps.
- 4.2.6. The main potential air quality impacts arising from construction activities are likely to be associated with fugitive dust emissions. However, these are generally variable in nature and can be dependent on the type of construction activity, ground conditions and prevailing weather conditions. A large proportion of dust from construction activities is usually caused by entrainment of dust disturbed by vehicle movements on unsurfaced haul roads. Similarly, dust can also be entrained from uncovered stockpiles and surplus spoil materials.
- 4.2.7. For fugitive dust from such construction works, a high proportion of any entrained dust is likely to be deposited within 100m<sup>5</sup>. Consequently because of the temporary nature of the construction activities, it is likely that the potential impacts would be in relation to dust deposition and potential nuisance in the immediate vicinity of the site rather than long term air quality concerns.
- 4.2.8. Appropriate mitigation measures would, however, enable these potential impacts to be reduced to acceptable levels. On the basis of the above, the spatial scope of the air quality assessment will cover the following:
- During construction, the effects of particulates (including dust) on any sensitive receptors within 100m of each works site; and
  - The impacts on air quality due to changes in road traffic flows during the construction and operation phases at distances up to 200m from the relevant road centre-lines.
- 4.2.9. Air quality impacts will be considered for the construction phase of the Scheme (between 2016 and 2018), and the project year of commissioning (2018). Consideration will be given in terms of changes in vehicle emissions as a result of potential significant increases in construction traffic flows.

## 4.3. Potential Impacts

- 4.3.1. The Scheme will result in a maximum of eight return journeys of steam or diesel powered locomotives and will not give rise to significant emissions of air pollutants at the point of use. Direct air quality impacts are not expected from the trains, or from normal maintenance works.

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<sup>5</sup> Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Minerals Extraction in England. Annex 1: Dust



4.3.2. Therefore, it is anticipated that any potential impacts to air quality will primarily occur during the construction phase. The assessment will address the following potential impacts:

- Dust and airborne particulate emissions associated with demolition, excavation and construction works; and
- Exhaust emissions from construction and site traffic (including and material and waste transport).

4.3.3. Emissions to air in the form of particulates and gaseous pollutants can produce effects upon sensitive receptors both in terms of nuisance (categorised as visible soiling of surfaces) and health (where pollutant concentrations exceed adopted criteria). Both aspects will be covered within the assessment.

## 4.4. Evaluation of Impacts

4.4.1. Air quality effects fall into two distinct categories: soiling and/or health impacts. Soiling generally occurs during the construction phase and includes effects such as dust deposition and soiling of surfaces. Health impacts are generally concerned with ambient concentrations of pollutants which for the assessment will be identified as nitrogen dioxide (NO<sub>2</sub>) and fine particulate matter less than ten microns in diameter (PM<sub>10</sub>), and may occur during construction as well as the operational phase.

4.4.2. Fundamental to determining the significance of air quality impacts is the consideration of the magnitude of any change in concentrations of the critical pollutants, NO<sub>2</sub> and PM<sub>10</sub>. These will be evaluated in terms of their relative impact on prescribed levels of air quality; in particular:

- Whether emissions from construction activities and vehicle exhausts are likely to breach National Air Quality Objectives (NAQOs)<sup>6</sup>; and
- Whether emissions from construction activities and vehicle exhausts are likely to lead to a significant change in air quality emissions below NAQOs.

4.4.3. There are no formal evaluation criteria for the assessment of nuisance dust in terms of soiling and so the assessment would be based upon a general assessment of risk and professional judgement, taking into account sensitive receptors, the numbers of people having the potential to be effected, and the likelihood of adverse comment arising from affected parties. The risks of potential dust impacts occurring will be ranked as low, medium or high. The assessment will take into account, and assumes the application of, the Building Research Establishment (BRE): *Control of Dust from Construction and Demolition Activity*, as well as useful guidance in the Greater London Authorities *Control of dust and emissions from construction and demolition*.

4.4.4. The assessment considers significant effects both in terms of absolute changes in air quality and changes relative to the NAQO's. Any exceedance of the NAQO's, which is due, directly or indirectly to the Scheme, is likely to be deemed significant, although such judgement requires an understanding of the wider context of the change.

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<sup>6</sup> These were adopted within the UK's Air Quality Strategy (Defra 2007)



- 4.4.5. Guidance sourced from the DfT *Transport Analysis Guidance* (WebTAG) and *Design Manual for Roads and Bridges* (DMRB) Volume 11, Section 3, Part 1, HA 207/07 in order to define significance. Although DMRB addresses road developments, it is relevant to other schemes with the potential to generate or change traffic and thus have the potential to effect air quality.

### Local Air Quality

- 4.4.6. The DMRB methodology assesses changes in pollutant concentrations, with and without the Scheme, allowing specific road links where traffic generated by the Scheme may lead to a significant increase in roadside NO<sub>2</sub> or PM<sub>10</sub> concentrations, at sensitive receptors, above the 'do nothing' scenario. For the local assessment, affected roads are those that meet any of the following criteria:
- Road alignments that will change by 5m or more;
  - Daily traffic flows that change by 1,000 Annual Average Daily Traffic (AADT) or more;
  - Heavy duty vehicle (HDV) flows that change by 200 AADT or more;
  - Daily average speed that changes by 10km/hr or more; or
  - Peak hour speed that changes by 20km/hr or more.
- 4.4.7. None of the criteria described above would be achieved as a result of the Scheme and therefore local air quality assessment as a result of changes to/ on the highway network is scoped out of the assessment.

### Dust Emissions from Construction

- 4.4.8. Receptors in close proximity to construction sites are likely to experience significantly greater exposure and nuisance/soiling as a result of dust emissions where these are not otherwise mitigated. Significant dust deposition or soiling is unlikely to occur at distances greater than 100m from a construction site. A risk based assessment will be utilised to assess any potential adverse effects. The risk assessment will consider the distance from the relevant construction sites, the types of construction activity and their propensity to emit dust, prevailing meteorological conditions, scheduling of the construction activities, levels of control to be adopted by the developers and their contractors and other factors that might affect the propagation and dispersion of dust.

### Evaluation of Significance

- 4.4.9. An effect is considered significant if either of the following situations apply due to the proposed Scheme:
- The Scheme (directly or indirectly) would lead to an increase in annual mean PM<sub>10</sub> concentrations of at least 1µg/m<sup>3</sup> (microgram per cubic meter) at receptors within 200m of the centre of an affected road; or
  - The scheme would lead to an increase in annual mean NO<sub>2</sub> levels of at least 2µg/m<sup>3</sup> at receptors within 200m of the centre of an affected road, and where the road with the scheme is above the NAQO for NO<sub>2</sub> of 40µg/m<sup>3</sup>.



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4.4.10. These criteria will be used to inform the judgement as to whether a particular change in concentrations or emissions is a significant change or not. However, the judgement of significance will also be determined by the context in which the change occurs; for example, whether the potential change in emissions or concentrations occurs in an area which is already exposed to levels that exceed the NAQOs.

## **4.5. Mitigation and Residual Effects**

4.5.1. As part of the air quality assessment suitable mitigation measures during the construction phase will be considered where significant potential impacts are identified. Measures will be appropriate to the risk posed by the construction and demolition operations in accordance with a Construction Environmental Management Plan (CEMP) which the contractor will be required to prepare.

## **4.6. Assumptions and Limitations**

4.6.1. At the scoping stage no limitations or assumptions in the assessment methodology have been made.



## 5. ARCHAEOLOGY AND CULTURAL HERITAGE

### 5.1. Introduction

- 5.1.1. This section describes the scope and proposed methodology for the assessment of effects on archaeological remains that potentially may result from the construction and operational phases of the Scheme.
- 5.1.2. In undertaking the archaeological assessment, consideration will be given to the policies and plan adopted by the relevant authorities and both governmental and regulatory bodies. These comprise:
- The National Planning Policy Framework;
  - The Rother Local Plan (2006);
  - The Rother new Local Plan (2011-2028);
  - DCLG - Environmental Impact Assessment: A guide to good practice and procedures;
  - DCLG - PPS5 Planning for the Historic Environment: Historic Environment Planning Practice Guide (2010);
  - English Heritage - Conservation Principles : Policies and Guidance for the Sustainable Management of the Historic Environment (2008);
  - English Heritage – The Setting of Heritage Assets (2011); and
  - Institute for Archaeologists – Standard and guidance for historic environment desk-based assessment (2012).
- 5.1.3. The archaeological assessment will consider a number of heritage assets with archaeological interest, designated or not, that could potentially be affected by construction and operation of the Scheme. These include:
- Standing remains including earthworks;
  - Buried remains, including evidence of past environmental change; and
  - Large heritage assets, including historic landscapes, battlefields and areas of archaeological significance or interest defined by the relevant local authority.
- 5.1.4. The assessment excludes listed buildings, locally listed buildings, parks and gardens and conservations areas, which will be assessed in Chapter 10.

### 5.2. Current Baseline

- 5.2.1. The Scheme would be constructed through an area of informal fieldscapes dominated by small, irregular enclosures, perhaps dating from the medieval period onwards. Historic, nucleated settlements include Robertsbridge to the west and Salehurst to the north. Scattered farmsteads are likely to be of medieval or potentially Saxon origin. The remnant of a former deer park is located to the south of the Scheme. Evidence for early industrialisation of the Weald survives in the remains of several post-medieval kilns and forges/furnaces in the area. Later intrusions across the historic grain of the landscape include the tree-covered earthworks of the former railway and the Robertsbridge bypass.



- 5.2.2. Remains of earlier periods – i.e. Roman and prehistoric – are likely to be sparse and may not be a significant consideration; however, past studies have shown that the Rother Valley east of Robertsbridge contains significant depths of prehistoric alluvium indicative of soil erosion caused by early agriculture. Thus contemporary remains may be more widespread than the direct evidence suggests.
- 5.2.3. Initial studies indicate that the most significant asset of archaeological interest in the area is the remains of Robertsbridge Abbey, immediately to the south of the Scheme. The Abbey, which is designated as a Scheduled Monument, covers a wide area and includes built structures, earthworks and below ground remains; a brief examination of aerial photographs shows that significant remains extend beyond the designated area. The setting of this monument will be an important consideration during the assessment.
- 5.2.4. A wide range of sources will need to be consulted to characterise and establish the importance of the baseline for the assessment. No overall fixed boundary will be set for the 'Study Area'; rather, data will be collected for a variety of search areas appropriate to the source material. This flexible approach has been chosen as it is well suited to provide information on the Scheme itself and its immediate hinterland; the latter is important when considering the archaeological potential of the area and placing any findings in a local or regional context.
- 5.2.5. Mindful of this, the sources listed below will be consulted for the assessment.

<b>Data Consulted</b>	<b>Source Organisation</b>
Archaeological sites & monuments data; areas of archaeological significance/potential; historic landscape character; archaeological events	East Sussex County Council Historic Environment Record (ESHER)
Scheduled Ancient Monuments; Registered Battlefields	English Heritage (National Heritage List for England)
Aerial photographs – vertical and oblique	English Heritage National Monument Record Centre (EHNMRC); Google Earth
Cartographic Data	East Sussex Records Office (ESRO)
Published primary and secondary sources	EHNMRC; ESRO; ESHER
Planning policy	DCLG; Rother District Council
Wealden Iron Industry	Wealden Iron Research Group
Site visit	



- 5.2.6. In addition to the above, the East Sussex County Archaeologist will be consulted on the Scheme. The purpose of this will be to confirm that the assessment method is appropriate; understand any local issues of importance; be aware of any relevant on-going research or recent findings; and review the findings of the assessment and any recommendations for mitigation.
- 5.2.7. Where the data exists, individual assets will be identified and then characterised with reference to the following series of attributes: form; survival; condition; complexity; context; and period. The importance of the resource will then be assessed, as far as possible, by determining the relative value of an asset or group of related assets in the context of relevant policy, legislative designations and rarity at the appropriate scale, as follows:
- **very high** - resources of national importance – usually Scheduled Ancient Monuments or non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments ;
  - **high** - archaeological assets of regional or county importance;
  - **medium** - archaeological assets of district or local importance; and
  - **Low/negligible** - archaeological assets that are so poorly preserved as to not justify their inclusion in a higher grade.
- 5.2.8. Notwithstanding the above, it is likely that for the majority of assets there will be insufficient archaeological or historic landscape baseline data available to make a detailed characterisation a meaningful undertaking and a less formulaic approach will be adopted. Where this is the case, the potential of archaeological remains will be appraised. Consideration will also be given to archaeological assets that have yet to be discovered but for which demonstrable potential exists.

### 5.3. Potential Impacts

- 5.3.1. The assessment will examine a range of potential activities that might generate impacts on the baseline resource, the majority of which are likely to be attributable to construction of the Scheme. Impacts generated during the operation and maintenance of the new railway are less likely, although impacts on the setting of Robertsbridge Abbey could fall into this category. In addition, some impacts generated during the construction phase may only become apparent during operation.
- 5.3.2. The potential source of impacts to be considered will include, but not necessarily be limited to:
- Pre-construction site investigation works;
  - Enabling works such as utility diversions;
  - Temporary works – work sites, haul routes;
  - Top soil stripping;
  - Bulk excavation;
  - Piling;
  - Mitigation works such as bunding and tree planting;
  - Burial of archaeological sites and monuments;
  - Impacts on setting from new earthworks and structures; and



- Noise and visual impact from trains on the setting of historic assets.

- 5.3.3. Given the nature of the proposed development, including its re-use of an historic rail route, the impact area is unlikely to extend beyond a relatively narrow corridor either side of the Scheme.
- 5.3.4. As with characterisation of the resource, it may not be possible to judge the magnitude of impacts with precision (due to a lack of baseline data rather than uncertainty over the activity that might generate an impact) and the potential impacts of the scheme will then be highlighted on the basis of construction assumptions.
- 5.3.5. Where data allows, severity of impacts will be judged with reference to the following:
- Consideration of the type, survival, fragility, research potential and amenity value of the assets affected; and
  - The proportion of the feature affected and whether key characteristics were compromised.
- 5.3.6. Impacts on the resource will be assigned a magnitude on the following five-point scale: major; moderate; minor; negligible; and no change.

## 5.4. Evaluation of Impacts

- 5.4.1. Where baseline data permits, the evaluation of impacts, which may be positive as well as negative, will be based on an assessment of their magnitude and the importance of the affected asset. Professional judgement and experience will be used to make an overall assessment and consideration will be given to the following:
- Reduction in the extent or completeness of a known asset due to its disturbance, severance or removal;
  - Reduction in the importance, value or integrity of the asset;
  - Deterioration in the setting of an asset;
  - Lessening of the extent to which an asset can be appreciated or enjoyed;
  - Deterioration in the preservation conditions of an asset;
  - Enhanced knowledge through archaeological mitigation;
  - Protection of archaeological resources through burial; and
  - Improving the quality of the setting of an archaeological monument and increasing its appreciation and understanding.
- 5.4.2. The degree of significance utilised in the assessment will follow a nine-point scale:
- Very large beneficial (positive) effect;
  - Large beneficial (positive) effect;
  - Moderate beneficial (positive) effect;
  - Slight beneficial (positive) effect;
  - Neutral effect;
  - Slight adverse (negative) effect;



- Moderate adverse (negative) effect;
- Large adverse (negative) effect; and
- Very large adverse (negative) effect.

## 5.5. Mitigation and Residual Effects

- 5.5.1. It is inappropriate to prejudge the results of the assessment, but clearly some form of mitigation may be required if significant impacts are identified for the setting of Robertsbridge Abbey. Likewise the damage to or loss of archaeological assets through construction could be mitigated through excavation and publication ('compensate by other'). In both cases, it is not inconceivable that residual effects might accrue; although, the use of a former railway alignment is likely to reduce the potential for impacts, the need for mitigation and any residual effects.

## 5.6. Assumptions and Limitations

- 5.6.1. The following assumptions are inherent within the assessment:
- Data provided by consultees is accurate and up to date; and
  - All archaeological assets within the footprint of the original railway were destroyed during its construction – and possibly over a slightly wider area.
- 5.6.2. In addition, the assessment has to recognise the following limitations:
- The baseline is incomplete: some assets are poorly recorded or understood and other have yet to be discovered;
  - Relevant data may not be readily available; and
  - Access is unlikely to be available for a complete site walkover of the alignment.



## 6. SOCIO-ECONOMICS

### 6.1. Introduction

- 6.1.1. This chapter describes the scope and methodology that will be used for the assessment of potential socio-economic impacts arising from the proposed Scheme. It should be noted that any socio-economic impacts related to the agricultural landholdings in the area would be considered separately as part of the Land Use and Agriculture assessment (**see Chapter 9**).

### 6.2. Current Baseline

- 6.2.1. The Scheme would be constructed through an area dominated by agricultural activities. The main residential areas are Robertsbridge to the west and Salehurst to the north. Just under 60% of the former railway corridor is still intact, with the remainder removed and the land returned to agricultural use.
- 6.2.2. Socio-economic resources and receptors are individuals, groups or entities whose access to, and control over, socio-economic assets, resources and opportunities that may be potentially affected. In the context of the Scheme, the nature of these is likely to be more rural. However, it is likely that socio economic impacts maybe experienced at other nearby areas and settlements; particularly those along the length of the existing Kent and East Sussex Light Railway, where provision of a link to the main railway network is predicted to have economic benefits related to an increase in tourism<sup>7</sup> to the area (information related to this will be primarily drawn from the MMU 2007 report<sup>8</sup> and the forthcoming update<sup>9</sup>).
- 6.2.3. Further work required to establish the baseline will include determination of receptors appropriate to the study these may include:
- Individual public and private sector employers, businesses and organisations (labour demand);
  - Individual employees and job seekers and labour force catchment areas/the employment market (labour supply);
  - Rural centres (such as Robertsbridge), and their commercial property markets (shops, offices and business space) and development sites, insofar as these may in the future impact on the level of economic activity;
  - Residential developments where these may influence economic activity through regeneration, investment and/or the labour market; and
  - Amenity developments such as recreational facilities.
- 6.2.4. Consultation will be important for establishing the baseline and the socio-economic views of key local stakeholders, and hence consideration would be given to consulting the following organisations to inform the socio-economic impact assessments:
- Tenterden Town Council;

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<sup>7</sup> The tourism sector is likely to be a major beneficiary of the Scheme

<sup>8</sup> Rother Valley Railway, Local Economic Impact Study, International Centre for Research and Consultancy Manchester Metropolitan University, September 2007

<sup>9</sup> To be completed late autumn 2013



- Ashford Borough Council – economic development officer;
- Kent County Council – economic development officer;
- Tenterden & District Chamber of Commerce; and
- Rother District Council.

6.2.5. Other baseline data will be extracted from the Office for National Statistics Census, Nomis, IMD etc. The baseline information in the impact area<sup>10</sup> will consist of:

- Population data;
- Regeneration, employment and economic development strategies of all relevant local authorities and agencies;
- Business data from ONS;
- Residents employed and workplace employment;
- Unemployment;
- Job vacancies; and
- All other relevant reports and data.

### 6.3. Potential Impacts

- 6.3.1. The socio-economic impact assessment will focus primarily on the potential impacts on employment during construction and on indirect and induced economic benefits from the Scheme (including opportunities – if any - for local supply businesses particularly during the construction period).
- 6.3.2. It is recognised that, in some cases, development impacts may become apparent before construction commences e.g. due to prior knowledge of land take or as a result of development decisions taken in anticipation of the Scheme. Long-term effects of the Scheme may also extend well beyond the design capacity date. However any quantified estimates will be given with the Scheme's design date in mind.
- 6.3.3. Given the nature of the proposed development, the primary impact area is unlikely to extend beyond the local ward of Salehurst. However, any operational impacts are likely to be experienced on a wider scale (see footnote 10 on impact area) given the main line connection the Scheme would provide to the existing Kent and East Sussex Light Railway and would not be restricted directly in the area of the development.
- 6.3.4. The socio-economic impacts will be broadly assessed at two geographical levels:
- The employment/health/amenity impacts will be assessed in the context of the defined local impact area, the extent of which will be agreed with Rother Valley Railway Ltd and relevant local planning bodies as noted above; and
  - Any impact on adjacent land uses will be assessed at a more immediate local level determined by the expected extent of impact.

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<sup>10</sup> The impact area will be agreed with the key stakeholders and could include Salehurst (Rother), Hawkhurst and Sandhurst (Tunbridge Wells), and Rolvenden and Tenterden West (Ashford).



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- 6.3.5. There is potential for many socio-economic impacts to be neutral (the following lists of potential impacts during construction and operations are comprehensive and many may be irrelevant to the Scheme under review) – however these need to be addressed throughout the process.
- 6.3.6. Potential impacts during construction could result from:
- Temporary or permanent displacement or disruption to businesses due to temporary land take or other construction effects;
  - Direct changes to local factors that influence the viability and vitality of town centres;
  - Direct changes in the demand for construction employees;
  - Indirect changes in the demand for employees due to the purchase of materials or services and the spending of incomes associated with construction of the Scheme;
  - Potential health impacts on local residents; and
  - Disruption to local amenities.
- 6.3.7. Potential impacts associated with the operation of the Scheme will be related to employment and regeneration issues within the above defined (suggested) impact area.
- Direct changes in the demand for employment associated with the operation of the new services;
  - Displacement or disruption of existing businesses and/or provision of new businesses directly due to permanent land take; and
  - Direct, indirect and multiplier jobs if any.

## 6.4. Evaluation of Impacts

- 6.4.1. The evaluation of impacts will be based on an assessment of their magnitude and the importance of the affected resources/receptors. Professional judgement and experience will be used to make an overall assessment and consideration will be given to the following:
- For example, the absolute number of people or businesses affected and the size of area in which effects are experienced; and
  - Consideration will also be taken of the relative importance of each effect in its relevant community and/or market context e.g. the effects on local employment are considered in the context of the overall size and characteristics of the local labour market – this reflects the sensitivity of the socio-economic receptors.
- 6.4.2. The assessment of any relevant employment and regeneration effects will comprise:
- Direct creation of jobs and other impacts on employment markets resulting from the construction and operation of the Scheme;
  - Indirect creation of jobs and other impacts on employment markets resulting from increases in spending during construction and operation;
  - Direct loss of jobs, and consequential changes to employment markets, due to the temporary or permanent displacement of businesses;
  - Indirect loss of jobs and consequential changes to employment markets, due to a reduction in spending associated with the displacement of businesses and jobs by the Scheme;



- 
- Improved or reduced access to major employment centres;
  - Changes to local vitality and viability of town centres; and
  - Impact on local public rights of way.

## **6.5. Mitigation and Residual Effects**

6.5.1. It is not envisaged that there will be any need for mitigation measures given the likelihood that overall socio-economic residual impacts will be beneficial or at worst, neutral.

## **6.6. Assumptions and Limitations**

6.6.1. The assessment will be influenced by assumptions made in regard to the following points:

- Committed and planned commercial developments and associated economic activity that may be affected within the agreed impact area;
- Estimation of construction by cost, timing and location associated with the Scheme provided by the civil engineering team;
- Traffic diversions to the rest of the local network;
- Inputs based upon community potential impacts covering social exclusion, locations of community facilities and areas that may be affected by disturbance, and
- Other relevant issues that may arise during the research.



## 7. ECOLOGY AND NATURE CONSERVATION

### 7.1. Introduction

- 7.1.1. This section describes the methodology and scope for assessment of the potential impacts and associated effects of the Scheme on ecological resources and receptors.
- 7.1.2. The proposed assessment method is in accordance with that recommended by the *Chartered Institute of Ecology and Environmental Management (CIEEM)* in its *Guidelines for Ecological Impact Assessment in the United Kingdom (2006)*.

### 7.2. Current Baseline

- 7.2.1. The ecological baseline study includes an assessment of the naturally occurring species and the habitats that support them within the near vicinity of the proposed Scheme. As a result of recent developments along the railway at each end of the proposed new section, there have been previous ecological studies undertaken which provide some relevant background and context.
- 7.2.2. Further baseline information will be sourced from:
- A review of readily available data including Sussex Biodiversity Information Centre, Natural England and the Environment Agency;
  - Information obtained through consultation with local councils, wildlife trusts and relevant conservation groups; and
  - Extended Phase 1 Habitat Survey of the accessible areas (see Assumptions and Limitations) of the proposed Scheme impact corridor and surrounding area.
- 7.2.3. As an overview, the Scheme follows an alignment along the valley of the River Rother within a landscape consisting of arable fields, agriculturally improved grassland and broadleaved woodland, much of which is ancient semi-natural.
- 7.2.4. When considering flora and fauna, particular attention is given to species afforded specific attention under domestic and EU legislation and policy, namely:
- Wildlife and Countryside Act, 1981 (as amended);
  - The Conservation of Habitats and Species Regulations 2010; and
  - UK and Local Biodiversity Action Plans (BAP) priority species and habitats.
- 7.2.5. Where potential impacts are predicted on species beyond the scope of Phase 1 habitat surveys an initial evaluation of significance will be provided with recommendations for further surveys prior to construction if these are considered necessary to verify the presence of species and so determine licensing or mitigation requirements.
- 7.2.6. The proposed Scheme does not pass within 2km of any Natura 2000 or SSSI sites.



- 7.2.7. The Sussex Biological Records Centre (SXBRC) report shows a substantial block of Ancient Woodland Biodiversity Action Plan (BAP) habitat 200m to the south of the site as well as showing an area of Grazing Marsh BAP habitat directly on the route of approximately 400m of the proposed line. This grazing marsh BAP habitat, having been significantly modified with flood embankments and being so close to main roads, trees, housing and dog walking disturbance, is currently of limited ecological value. The area of grazing marsh BAP habitat likely to be lost as a result of the proposed development (approximately 0.4 ha) is, therefore, not deemed significant.
- 7.2.8. Two locally designated areas fall within the search area, to the north of the site:
- SNCI CR20 – South Park Pony Stud Meadows – a series of Biodiversity Action Plan (BAP) habitat species rich lowland meadows with a number of ponds and two shaws containing species indicative of ancient woodland located approximately 1.1km north of the Scheme; and
  - SNCI CR59 – Silverhill & Trough Wood – 21 ha of ghyll woodland supporting ancient woodland indicators and straddling a southwest northeast running stream with a steep, species rich gully located approximately 1.8km north of the Scheme.
- 7.2.9. The River Rother is twice intersected by the proposed track alignment and habitats alongside the river are considered important in the local context.
- 7.2.10. An extended Phase 1 habitat survey was carried out on 19th July 2013, in areas where access was available, and identified potential habitat along the proposed route for the following notable species: Great crested newt, bats, badger, water vole, dormouse and reptiles.
- 7.2.11. A significant length of the dismantled railway, in the eastern section of the site is under the cover of broadleaved woodland which appeared to be dominated by ash (*Fraxinus excelsior*) and oak (*Quercus spp*) with an understory of hazel (*Corylus avellana*), hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*), ivy (*Hedera helix*), dog rose (*Rosa canina*) and bramble (*Rubus fruticosus*). A network of species-rich hedgerows and hedgerows with trees (typically containing a mix of oak, field maple (*Acer campestre*), holly (*Ilex aquifolium*), spindle, hazel, hawthorn, blackthorn and ash) connect the site with neighbouring areas of ancient woodland.
- 7.2.12. The River Rother meanders along the south of the site and is largely under the cover of woodland and/or bankside vegetation by the eastern end of the site. Species noted include willow (*Salix spp*), alder (*Alnus glutinosa*), oak, blackthorn, hawthorn, hornbeam (*Carpinus betulus*), dogrose, ivy, meadowsweet (*Fillipendula ulmeria*), hogweed (*Heracleum sphonylium*), nettles (*Urtica dioica*), thistles (*Cirsium spp*), buttercup (*Ranunculus*), herb robert (*Geranium robertianum*), hemp agrimony (*Eupatorium cannabinum*), purple loosestrife (*Lythrum salicaria*), hemlock water dropwort (*Oenanthe crocata*) and pendulous sedge (*Carex pendula*).
- 7.2.13. There are several ditches that drain into the river from the site and bordering farmland, and the western end of the site falls into the area designated as BAP priority habitat – Floodplain grazing marsh.
- 7.2.14. A total of 9 ponds have been identified within 500m of the proposed line (excluding two directly in its path).
- 7.2.15. The western section of the site is dominated by arable farmland. Due to the nature of farming practices the arable land is considered to be of low ecological value. Some of this



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land does contain semi-improved permanent grass field margins, however, the botanical diversity of these margins is low.

### **Amphibians**

- 7.2.16. The ponds and slow moving ditches have potential for breeding amphibians including great crested newt, which have recently been recorded in the local area. One of the ponds is surrounded by cultivated arable land which reduces the opportunities for commuting habitat and for meta-populations to form, unlike the other pond which lies next to grassland and scrub. Any marshy areas, dry ditches, areas of woodland, grazing pasture and scrubby vegetation nearby or on site represent suitable foraging habitat for great crested newts.

### **Reptiles**

- 7.2.17. The site could afford suitable habitat for reptiles that have been recorded nearby including; slow-worms, common lizards and grass snakes, particularly in areas of rough grassland and scrub.

### **Bats**

- 7.2.18. The river corridor and the linear woodland along part of the old trackbed are likely to act as commuting and foraging routes for bats and the surrounding ponds and areas of rough vegetation are likely to provide good foraging habitat. Given the potential roosting sites in the surrounding areas (the ancient and mature trees and the old buildings and structures), the potential for bats to be using the site is high.

### **Dormice**

- 7.2.19. Although there are no recent records in the local area, and no signs of dormice were found during the site visit, it is suggested that dormice may use hedgerows for commuting between the more wooded areas in the vicinity as well as potentially foraging along its length.

### **Water vole**

- 7.2.20. Although there were no field signs of water vole during the site survey there is potential for them to be using the river and nearby ditches on site.

### **Otter**

- 7.2.21. Otters are known to be present in the river catchment and anecdotal evidence suggests that there has been one recent unconfirmed sighting in this area. Otters are not confined to a watercourse and its banks and may shelter hundreds of meters away. However, during the survey visit no field signs, such as footprints, runways or spraints were found.

### **Badger**

- 7.2.22. A probable badger sett was found towards the eastern end of the site along the line of the proposed track. There are limited foraging opportunities for badger along the trackbed itself.



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## 7.3. Potential Impacts

- 7.3.1. Ecological impacts comprise direct or indirect physical changes to habitats or to the species of plants or animals within them. Given that the Proposed Scheme is a low frequency single track railway it is not predicted that there would be any significant impacts during the operational phase and that any physical change to habitats would occur as a consequence of the construction phase only. As such it is proposed to scope out the operational phase for the assessment of ecology and nature conservation.
- 7.3.2. The potential impacts will be considered in the context of their reversibility and the dynamic nature of the environment in which they occur. The existing ecological conditions have developed since the closure of the railway in 1961 and have over this time been influenced significantly by agricultural practices over a large portion of the route.
- 7.3.3. Potential impacts include:
- Loss of habitats or vegetation due to temporary land take for construction or to permanent land take for new structures;
  - Habitat fragmentation or severance of wildlife corridors due to vegetation clearance preventing the movement of species;
  - Reinstatement and/or creation of new habitat as well as re-establishment of wildlife corridors through the reinstatement of the railway line through the current low ecological value agricultural land ;
  - Changes in surface and groundwater hydrology through the modification of the cross section of watercourse due to bridges or river diversions, or the alteration of drainage patterns;
  - Changes in water quality through accidental contamination from dust and spillages, or contaminated run off;
  - Habitat/species disturbance due to noise, vibration and light emissions during both construction, e.g. vibration impacts from machinery, and operation, e.g. potential impacts of lighting on nocturnal species from the railway;
  - Introduction of invasive species;
  - Dust deposition during construction; and
  - Non-specific disturbance to species, e.g. birds, due to presence of construction crews and equipment.
- 7.3.4. The following ecological effects arising from the potential impacts described above will be identified:
- Loss, damage and depletion to habitat resources and habitat value;
  - Creation of new habitat corridors;
  - Loss, damage and depletion of species, including protected species; and
  - Reduced viability of populations, communities and assemblages.

## 7.4. Evaluation of Impacts



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7.4.1. The value or potential value of an ecological resource should be determined within a defined geographical context. For this assessment the following classifications will be applied:

- International;
- UK;
- National i.e. England/Northern Ireland/Scotland/Wales;
- Regional;
- County;
- District (or unitary authority);
- Local or parish; and
- Within the Scheme's zone of influence which might be constrained to the defined Scheme footprint or encompass a larger area.

7.4.2. Broadly following the CIEEM guidelines, a range of criteria will be considered in assigning ecological value, as follows:

- Presence of sites or features designated for their nature conservation interest;
- Biodiversity value; for example: habitats or species which are rare or uncommon, species rich assemblages, species which are endemic or on the edge of their range, large populations or concentrations of uncommon or threatened species, and/or plant communities that are typical of valued natural/semi-natural vegetation types;
- Potential value, as addressed by targets to increase the biodiversity value of designated sites and some BAP species and habitats;
- Secondary and supporting value; for example: habitats or features which provide a buffer to valued features, or which link isolated areas;
- Social value - the extent to which a site and its wildlife provide a resource that people use or enjoy;
- Economic value; for example: ecological resources that offer financial opportunities, such as entrance fees;
- Presence of legally protected sites or species;
- Presence of UKBAP or borough BAP habitats and species; and
- Social and economic values associated with biodiversity will be considered as part of the local evaluation of the site.

7.4.3. When describing changes/activities and potential impacts on ecosystem structure and function, reference will be made to the following parameters:

- Positive or negative;
- Magnitude;
- Extent;
- Duration;
- Reversibility; and



- Timing and frequency.

7.4.4. Predicting impacts will be characterised as either significant or insignificant, primarily on the basis of effects on ecosystem integrity or conservation status of species.

7.4.5. In order to provide a summary of the overall assessment, a seven-point scale will be used to summarise the importance of an effect as follows:

- **Substantial beneficial:** the effect is likely to cause a permanent beneficial impact on the integrity of an international, UK and/or nationally important ecological feature;
- **Moderate beneficial:** the effect is of a magnitude likely to benefit a regional and/or metropolitan valued ecological feature;
- **Minor beneficial:** the effect is of a magnitude likely to benefit a borough and/or locally valued ecological feature or be a short-term benefit to regional and/or metropolitan feature;
- **Negligible:** no discernible effect;
- **Minor adverse:** the effect is likely to be adverse to a borough and/or locally valued ecological feature, or a short-term or readily remediated effect i.e. with no permanent effect on its integrity, to a feature of borough/metropolitan importance;
- **Moderate adverse:** the effect is likely to be long-term adverse to a feature of regional, county and/or metropolitan value; and
- **Substantial adverse:** the effect is likely to cause a permanent adverse impact on the integrity of an international and/or nationally important ecological feature.

7.4.6. This scale has been chosen in accordance with the CIEEM assessment. It is considered that its inclusion can assist in comparing the importance of ecological effects with those arising in other disciplines. In this assessment, any moderate or substantial effect is deemed to be significant.

7.4.7. It is considered unlikely that potential impacts from the construction of the proposed Scheme would extend beyond the footprint of development and areas immediately adjacent, due to the Scheme's scale and nature. The assessment to date, has considered ecological resources up to 250m from the Scheme. This zone of influence was extended beyond 250m depending on the known ecology of the species in question, for example great crested newts (500m) and otter.

7.4.8. Ecological effects could be long term or short term depending on the ecological receptor that is impacted upon. It is assumed that the impacts (both temporary and permanent) will occur mainly during construction but there may be some that will have permanent or long terms impacts during the operational phase; for example due to disturbance from trains.

7.4.9. At the time of writing no further access to land affected by the proposed scheme, and owned by third parties, is available and as such the assessment methodology has been devised on the assumption that this will not be forthcoming prior to determination of the application. Rother Valley Railway Limited intend to continue dialogue with affected landowners with a view to agreeing access to undertake species specific surveys. In lieu of undertaking these surveys the proposed methodology is as follows:

- Biological records data search;
- Remote observation from public rights of way to assess Phase 1 habitat types where access not permitted;



- Remote sensing using high resolution aerial photography to assess Phase 1 habitat types;
- Develop assumptions for presence/absence and potential population size based on pre-agreed criteria with relevant consultees where practicable; and
- Consultation with special interest groups for any additional data.

7.4.10. Prior to the commencement of the development it is proposed that ecology survey work will continue where practicable (and where land access can be obtained) in order to support the further development of any proposed mitigation.

7.4.11. In addition to the assessment described above a Water Framework Directive Screening assessment would be undertaken in order to appraise the effects of the Scheme on the River Rother's ability to achieve compliance with the directive.

## 7.5. Mitigation and Residual Effects

7.5.1. A preliminary assessment of mitigation strategies to minimise disturbance to ecological species and habitats will be carried out and proposed mitigation may include:

- Minimising vegetation removal including developing a Tree Protection Plan in line with the British Standard 5837:2005 Trees in relation to construction;
- Avoiding clearance of vegetation during the bird nesting season;
- Demarcating 10m works exclusion zones around watercourses and water bodies that are within the zone of influence and not directly impacted by the Scheme;
- Ensuring contractors comply with the Environment Agency's Pollution Prevention Guidelines;
- Developing Ecological Management Plans (EcMP) prior to the commencement of construction works, detailing potential impacts, mitigation and monitoring including post-construction monitoring of new habitats;
- Minimising disturbance to animals including sensitive use of artificial lighting and using barriers to reduce visual and noise disturbance near sensitive species;
- Avoiding construction during breeding seasons for sensitive species; and
- Consideration of measures to enhance biodiversity and habitat regeneration where possible.

7.5.2. The ecological mitigation strategy will reflect the dynamic and mobile nature of the ecological value potential impacted by the proposed development. It will therefore respond appropriately to the likely impacts identified, whilst ensuring that sufficient flexibility is retained in relation to delivery of the suite of ecological mitigation to enable it to be suitably modified prior, during and post the construction phase, to respond to the findings of any additional pre-construction surveys as well as the requirement of the local planning authority and key stakeholders.

## 7.6. Assumptions and Limitations

7.6.1. Despite concerted efforts by the Rother Valley Railway to gain permission to access all areas of the proposed Scheme it has only been possible to visit one area fully. The remainder of the site (i.e. those areas owned by third parties) have therefore been viewed



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and assessed from adjacent accessible and/ or overlooking land, Public Rights of Way and/or roads and from aerial photographs.

- 7.6.2. This approach is in accordance with Part 1 Schedule 4 of the Regulations, which obliges the applicant to provide an assessment of the environmental effects of the development to the extent they can, having regard in particular to current knowledge and methods of assessment.
- 7.6.3. Whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment.
- 7.6.4. The impact assessment relies on the information available from previous site surveys, existing studies available to the team, and on the professional judgement of the assessors in applying the precautionary principle.
- 7.6.5. The list of species and habitats that will be identified in the baseline study and identified as potentially impacted are limited by factors such as the time of year and migration trends of species when ecological surveys were carried out. Therefore additional species may be identified in subsequent surveys.
- 7.6.6. European Protected Species and Protected Species licences will need to be obtained from Natural England should disturbance to protected species be identified. Application for these licences would require appropriate surveys in line with Natural England best practice guidance.



## 8. LAND QUALITY

### 8.1. Introduction

- 8.1.1. This section describes the methodology and scope for the assessment of the potential impacts and associated effects of the Scheme on land quality.
- 8.1.2. In developing the potential scope of the land quality assessment, consultation has been undertaken with the Senior Environmental Health Officer at Rother and Wealden Environmental Health Service (telephone conversation on 7th August 2013). During the discussion, it was suggested that there may be a requirement for a ground investigation and quantitative land quality risk assessment should the Council grant planning permission, but that a Preliminary Land Quality Risk Assessment (PLQRA) discussing potential pollutant linkages as defined in technical guidance would be sufficient to support the application – as long as the PLQRA considered both:
- the potential for existing ground-based contaminants to adversely impact human health and environmental receptors; and
  - the potential impacts of railway construction activities and an operational railway on future land quality.
- 8.1.3. The Senior Environmental Health Officer further advised that the PLQRA report be prepared in accordance with a local technical advice note, which will be provided in due course, and agreed that in general the report's content should follow guidance contained in Contaminated Land Report 11 - Model Procedures for the Management of Land Contamination.
- 8.1.4. It is understood that the Council will want the report to be written by a suitably qualified assessor<sup>11</sup> and that it should begin to consider whether the land, once developed, would be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990 – taking account of the changes in statutory guidance of spring 2012.
- 8.1.5. The PLQRA should also take account of the National Planning Policy Framework (NPPF) and begin the process of demonstrating that the site is suitable for its new use taking account of:
- Ground conditions - considering both natural hazards and pollution arising from previous uses;
  - The development proposals - including any proposals for mitigation / land remediation; and
  - Impacts on the natural environment arising from the development / remediation proposals.

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<sup>11</sup> It is likely that the PLQRA will be written by Pete Leonard MEng (Hons) MCIWEM CWEM CEnv CEng.



- 8.1.6. For clarity, it is our understanding that Rother and Wealden Environmental Health Service is of the view that land quality matters can be satisfactorily dealt with via a “standard”, non-EIA, development control procedure in which any planning consent would be subject to conditions regarding the provision of information / risk assessments, delivery of remedial works (if needed) and validation of those works.
- 8.1.7. In light of the above it is our opinion that that the Scheme will:
- not significantly increase chronic human exposure to soil based contaminants (if contaminants are indeed present); and
  - should make no more than minor changes to existing groundwater and surface water regimes.
- 8.1.8. It is therefore proposed that land quality matters (particularly in respect of any detailed assessment of construction and operation phases) are ‘scoped out’ of the EIA – and be managed via “standard” development control/planning procedures.

## 8.2. Scope of Work

- 8.2.1. Given the above, this section sets out the aims, methodology and scope of the “stand-alone” Preliminary Land Quality Risk Assessment (PLQRA) that will be prepared to support the planning application for the proposed Scheme starting with a discussion of the need for that report.
- 8.2.2. Although published in 1995, the Department of the Environment Industry Profile for Railway Land is still a very useful and current source of information to those interested in land contamination. The document contains information on the processes, materials and wastes associated with railways. It also and introduces some of the technical considerations that need to be borne in mind by those making an assessment of possible contamination.
- 8.2.3. The Profile includes discussion of running lines and lineside land, such as will be developed, and recognises that whilst these parts of the railway are generally far less polluted than, say, depots there is some potential for land based contaminants associated with Made Ground (in embankments), ash, wood preservatives and herbicides.
- 8.2.4. The PLQRA report will consider the risks to controlled waters, human health and the proposed infrastructure – in the construction and operational stages of the railway development. Its content will be designed to provide the local authority and Environment Agency regulators with information which they can use to formulate conditions, and to minimise the risk of an objection on the grounds of insufficient information.
- 8.2.5. The proposed scope is outlined below:
- Site walk over inspection (where possible) to identify and record on and off site existing land uses, potential areas of concern with respect to soil and groundwater contamination sources and potential contaminants of concern;
  - Review of historical maps to establish the development history of the property and past on and off site potentially contaminative activities;
  - Collection and review of environmental data (pollution incidents, water abstractions, landfill sites, normal contaminant concentrations, etc). This would comprise a review of publicly available environmental data from a propriety data base, a formal local authority search, and interrogation of websites hosted by the Environment Agency and BGS;



- Obtaining a small number of borehole logs from the BGS database to provide information on the geology and hydrogeology in the site locality;
- Desk top review of in house geological and hydrogeological data for the site;
- Preparation of an interpretative report that includes an assessment of the desk study data, site walk over inspection and presents a site conceptual model with preliminary risk assessment;
- Site walk over inspection to identify and record on and off site existing land uses, potential areas of concern with respect to soil and groundwater contamination sources and potential contaminants of concern;
- Review of historical maps to establish the development history of the property and past on and off site potentially contaminative activities;
- Collection and review of environmental data (pollution incidents, water abstractions, landfill sites, normal soil concentrations, etc). This would comprise a review of publicly available environmental data from a propriety data base, the local authority (via a formal search), and websites hosted by the Environment Agency and BGS;
- Obtaining borehole logs from the BGS database, where possible, to provide information on the geology and hydrogeology in the site locality;
- Desk top review of in house geological and hydrogeological data for the site; and
- Preparation of an interpretative report that includes an assessment of the desk study data, site walk over inspection and presents a site conceptual model with preliminary risk assessment - considering both: a) the potential for existing ground-based contaminants to adversely impact on human health and environmental receptors; and b) the potential impacts of construction activities and an operational railway on future land quality.

8.2.6. It should be noted that the technical guidance with respect to the content of PLQRA reports directs assessors, amongst other things, to:

- Establish likely baseline conditions in a conceptual model (ground investigation records, soil test results, etc are not a pre-requisite);
- Describe potential impacts by establishing potential pollutant linkages (PPL);
- Make an evaluation of possible impacts in a risk assessment which also considers significance;
- Set out mitigation or remedial measures for PPL deemed to be significant; and
- Recommend the form of further risk assessment activities where the residual effect of PPL cannot be assumed to be tolerable or insignificant.

8.2.7. This is akin to an EIA chapter, but is somewhat preliminary as it allows for the collection of further data and the future development of mitigation measures in reaction to planning conditions.



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## 9. LAND USE AND AGRICULTURE

### 9.1. Introduction

- 9.1.1. This section considers the impact of the Scheme on agriculture and land use. It will consider the loss of agricultural land in terms of land quality, soil resources, local farm businesses and agri-environment schemes. The scope of the assessment will be guided by relevant legislation, planning policy and good practice guidelines.
- 9.1.2. This section makes reference to soil resources in relation to the agriculture assessment (generally pertaining to the top soil). Soil resources and geology are considered separately under Land Quality (Chapter 8).

### 9.2. Current Baseline

- 9.2.1. The Scheme will pass exclusively through agricultural land. Just under 60% of the original railway corridor remains intact and forms a heavily vegetated band through agricultural fields. The remaining length of the former railway corridor has been removed and the land assimilated into larger agricultural field units. Reinstatement of the railway would sever four field units created since the closure of the original railway. The proposed Scheme passes through three separately owned agricultural land holdings. These farms undertake the following activities on their land (west to east):

#### Landholding A

- 9.2.2. The land from Northbridge Street to the A21 is currently laid to pasture for sheep/cattle grazing. The remaining land is currently in arable rotation for the production of cereal crops, grazing/silage production and animal feed crops such as maize. The majority of the original low railway embankment has been removed and the hedges and trees alongside grubbed out to make way for productive agriculture.

#### Landholding B

- 9.2.3. This land extends from the boundary of Farm A to what is known as Austen's Bridge. The land appears to be the main permanent pasture with the majority of the original railway embankment still extant, as are lineside trees and hedges providing a green corridor across the land.

#### Landholding C

- 9.2.4. This relatively small piece of land extends from Austen's Bridge to the B2244 at Junction Road and is farmland in an arable rotation. The original embankment is still extant as are the trees and hedges providing a green corridor which is currently being used as a pheasant feeding area for the local shoot.
- 9.2.5. The section of agricultural land that the Scheme would sever and permanently take land from is shown to be of Agricultural Land Classification (ALC) Grade 3<sup>12</sup>. Grade 3 is split in

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<sup>12</sup> The Agricultural Land Classification data was sourced from magic.gov.uk (at a scale of 1:250,000). This data originates from The Ministry of Agriculture, Fisheries and Food (MAFF) who produced a Provisional ALC of England and Wales in the late 1960s/early 1970s at a scale of 1:63,360 (1" to 1 mile). However, this ALC information was based on reconnaissance field surveys and was intended to provide general strategic guidance on agricultural land quality. In addition to limitations of scale, this classification was undertaken to a methodology that has since undergone two



to two categories 3a and 3b. Land of Grade 1, 2 and 3a are considered to be the 'best and most versatile land'. For the purposes of the EIA it will be assumed that the agricultural land is Grade 3a (i.e. best and most versatile) thereby taking the precautionary approach of the worst case scenario.

- 9.2.6. The baseline agricultural conditions will be described in terms of the quality of agricultural land on the site, the nature of existing agricultural enterprises and agri-environment Schemes on the land.
- 9.2.7. Interviews with local farmers where possible will be used to further establish the baseline and establish potential impacts, particularly with regard to disruption, land access and offsetting any impacts.

### 9.3. Potential Impacts

- 9.3.1. Potential impacts on land use and agricultural resources are likely to arise solely during the construction phase of the Scheme, involving soil handling which will result in the loss of agricultural land. It is anticipated that some of the potential impacts would be temporary or short term in nature; these may include areas used for construction compounds, and spoil or material storage. Permanent impacts will occur where land take is required for the Scheme. Other potential impacts resulting from the Scheme could include:
- Removal of top and sub soils resulting in the intersection (loss), severance and isolation of agricultural land, on either a temporary or permanent basis,
  - Loss or restriction of access to agricultural fields;
  - Effects upon local farming businesses and agri-environment schemes, as a consequence of construction on agricultural land; and
  - Potential impacts to soil quality as a consequence of soil handling during construction and the beneficial use of soils for landscaping adjacent to the rail line.
- 9.3.2. It is anticipated that any losses of agricultural land or significant changes to land uses could have socio-economic impacts, and any significant impacts identified in this section would also inform the socio economics study, see Chapter 6.

### 9.4. Evaluation of Impacts

- 9.4.1. The evaluation of impacts will assess the effects on agricultural land and soil, existing agricultural enterprise and agri-environmental schemes. Significance will be based on the value of the receptor (e.g. quality of agricultural land). There are no established methods for assessing the effects of developments upon agricultural receptors. It is therefore necessary to interpret national and local policy in the context of previous best practice to develop a suitable assessment framework.
- 9.4.2. **Table 9.1** sets out the sensitivity of land use/resources.

fundamental revisions and also does not distinguish between the subgrades of Grade 3, which has important policy implications. However, for the purposes of understanding potential constraints on site at the early stages of the project it is deemed appropriate.



**Table 9.1 - Sensitivity of Land Use/Resources**

Receptor	Sensitivity
Land use/resources of national/international importance affected by the Scheme or in vicinity.	Very High/High
Land use/resources of regional/county level importance affected by the Scheme or in vicinity.	Medium
Land use/resources of local importance affected by the Scheme or in vicinity.	Low
Land use/resources of no importance affected by the Scheme or in vicinity.	Negligible

9.4.3. **Table 9.2** sets out the magnitude of change for land resources.

**Table 9.2 - Magnitude of Change – Land Resources**

Land Resource	Magnitude
The Scheme would directly lead to the loss of over 50 hectares of the best and most versatile agricultural land.	Major
The Scheme would directly lead to the loss of between 20 and 50 hectares of the best and most versatile agricultural land.	Moderate
The Scheme would directly lead to the loss of less than 20 hectares of best and most versatile agricultural land.	Minor
No permanent effect on high quality agricultural land.	Negligible/No Change

9.4.4. It is implicit in national planning policy that the loss of any land of best and most versatile quality is a significant effect, since a policy distinction is made between such land and land of lower quality to which no weight is normally to be accorded. However, the degree of significance of the effect will vary with the magnitude of loss. The size thresholds adopted in this respect have had regard to the statutory consultation procedure in which development proposals, individually or cumulatively, involve more than 20 ha of best and most versatile land, and do not relate to a development plan allocation, are referred to the national agricultural interest. It is implicit in this procedure that potential losses of best and most versatile land on this scale might be likely to raise considerations of national importance. **Table 9.3** sets out the magnitude of change for land use.

**Table 9.3 - Magnitude of Change – Land Use**

Land Use	Magnitude
Existing land use will be unable to continue as a direct/indirect consequence of the Scheme.	Major
Existing land use will be able to continue as a direct/indirect consequence of the Scheme, but with noticeable operational changes and economic effects.	Moderate
Small changes will not materially affect a continuation of the land use.	Minor
No change is predicted to occur in existing land use.	Negligible/No Change



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## 9.5. Mitigation and Residual Effects

- 9.5.1. In accordance with national planning policy, the best mitigation for agricultural land is to minimise the loss of the highest quality and most versatile agricultural land wherever practicable whilst ensuring that schemes meet their other operational, engineering and environmental requirements.
- 9.5.2. A permanent loss of agricultural land cannot be mitigated directly. The impact associated with a loss of agricultural land must, however, be considered against any positive socio-economic benefits brought about if the Scheme is approved.
- 9.5.3. Consideration may need to be given to the future use of land that could otherwise be sterilised as a result of the Scheme by having no or limited possibilities for vehicular access; and to agricultural land that would be required temporarily for construction purposes and that would be restored following the completion of the works.
- 9.5.4. In terms of potential impacts on soil quality, it is anticipated that some (if not all) of the potential adverse impacts on the soil resource could be mitigated by re-using soils on site and ensuring the quality of the soils retained on site is maintained by employing best practice standards. Soil handling and management during the construction phase should follow the guidance in "The Good Practice Guide for Handling Soils" (MAFF, 2000), DEFRA's "Code of Practice for the sustainable use of soils on construction sites" (2009), and 'Protecting our Water, Soil and Air, The Code of Good Agricultural Practice', DEFRA 2009.
- 9.5.5. Mitigation would be incorporated into construction practices by protecting against damage during stripping, handling, stockpiling and restoration by adoption of appropriate up to date guidance measures. These measures aim to protect topsoil resources from damage.
- 9.5.6. It will also be important to establish the most suitable use for soils disturbed and displaced by the construction works, both on site and off site, if required.
- 9.5.7. Farm holdings will be affected by land take and severance. Consultation will be held with the owners and occupiers of agricultural land where possible to seek their views on how to best offset or reduce the physical disturbance to these holdings. The resulting proposals might include the provision of alternative farm accesses and other farm infrastructure such as replacement fencing, drainage or water supplies; or the formalisation of land exchanges.
- 9.5.8. Many of the potential effects identified on farmland and holdings, such as dust or traffic potential impacts during the construction period, will need to be mitigated through the CEMP.
- 9.5.9. The condition of the soils that may be disturbed and retained on site will need to be monitored to ensure their continued suitability for their new use, in terms of their physical and chemical properties.

## 9.6. Assumptions and Limitations

- 9.6.1. It is not proposed to undertake an Agricultural Land Classification survey; instead it is assumed that agricultural land on site is Grade 3a 'best and most versatile'.



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- 9.6.2. The baseline data collection is reliant on participation of the relevant land owners to discuss their agricultural operations in order to understand how any impacts may affect the agricultural land holding. Where full participation is not achieved, assumptions may need to be made in order to undertake the assessment. Any assumptions would be based on the precautionary approach.



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## 10. LANDSCAPE AND VISUAL IMPACTS

### 10.1. Introduction

10.1.1. This section describes the scope and proposed methodology for the assessment of impacts on the landscape resources and visual amenity that could potentially arise from the construction and operational phases of the Scheme. The scope has been identified following a preliminary assessment of the receiving environment, a review of the principal sources of published information relating to the area and, where possible, initial discussions with key local stakeholders.

10.1.2. The preliminary assessment was undertaken in July 2013. It considered the existing character and condition of the site and the likely effects of the Scheme. Based on this, the following issues have been identified as key landscape or visual considerations:

- The Scheme runs through the floodplain of the River Rother. Parts of the original alignment are defined by linear stands of mature vegetation which contribute to the existing character of the area, while other sections are no longer apparent in the landscape;
- The Scheme is situated entirely within the High Weald Area of Outstanding Natural Beauty (AONB);
- The area around the site is served by a network of roads and public rights of way, a number of which are crossed by the former and proposed alignment of the railway;
- There are groups of residential properties and isolated farmsteads with potential views towards the site;
- The visibility of the site is strongly influenced by a combination of the landform of the valley and the presence of mature vegetation; and
- There are a number of Listed Buildings, Conservation Areas and Scheduled Monuments adjacent to the proposed alignment of the Scheme.

10.1.3. Consequently, the assessment of potential landscape and visual impacts will consider:

- The landscape features that may be affected by the proposals;
- The existing and historic contributions made by the railway to the character and local distinctiveness of the area;
- The extent of the area from which the proposals may be visible;
- Representative summer and winter views towards the site from publicly available viewpoints within the valley and from more elevated positions overlooking the valley ;
- Views from groups of residential properties;
- Views from the Listed Buildings, Conservation Areas and Scheduled Monuments adjacent to the site, particularly from within the setting of the Listed Robertsbridge Abbey (Impacts on the settings to these features will be considered in more detailed in Section 5: Archaeology and Cultural Heritage); and
- Seek to identify mitigation measures to minimise the impacts on the landscape features contributing positively to local character and ensure that any new planting is compatible with and reinforces the existing character.



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- 10.1.4. The assessment methodology will principally be developed in accordance with the Guidelines for Landscape and Visual Impact Assessment (Third Edition) published jointly by the Landscape Institute and the Institute of Environmental Management & Assessment in April 2013. Compared to the previous edition of the GLVIA, the new guidance places increased emphasis on '*clarity and simplicity in approach and the importance of professional judgement.*' This will be reflected in the methodology used.
- 10.1.5. Some additional useful guidance is provided by *WebTAG*, the Department for Transport's (DfT) web-based guidance for the appraisal of the impacts of transport schemes on landscape and townscape character and Volume 11 of the *Design Manual for Roads and Bridges* (DMRB). While the Scheme is not road traffic related, it is nevertheless a linear transportation feature, so this guidance will be referred to where relevant. The Countryside Agency and Scottish Natural Heritage publication *Landscape Character Assessment*, (1999) will also be used as appropriate.

## 10.2. Current Baseline

- 10.2.1. The assessment of the current baseline will consider the existing character, condition and context of the landscape within which the Proposed Scheme will be situated. This will involve an analysis of desk-top research and further site based assessments to determine the baseline landscape and visual resources against which any impacts will be assessed. This will be undertaken in accordance with the principles and guidance set out in Guidelines for Landscape and Visual Impact Assessment 2013 (GLVIA). These desk studies and the associated field validation will be used to establish the landscape character and sensitivity of the landscape and to define the Zone of Theoretical Visibility (ZTV) for the Scheme.
- 10.2.2. Key sources of information for the desk studies will include Ordnance Survey (OS) mapping, aerial photography, local authority plans, existing landscape designations and existing character assessments associated with the study area. These studies will consider the landscape character areas, the designated landscape areas and features, key views and landform, land cover and existing land use patterns.
- 10.2.3. The site lies within the High Weald Area of Outstanding Natural Beauty (AONB), which covers 80% of the district. The floodplain of the River Rother covers the whole area of the Scheme, so the site is part of a largely rural environment, with the former alignment of the railway closely following the course of the River Rother. The landscape predominantly consists of established, settled farmland, with a mixture of both arable and pastoral land present within a historic pattern of hedgerows and trees. The mature trees along the embankment of the dismantled railway form part of this landscape pattern. The floodplain is then enclosed by larger areas of woodland on the valley slopes, with significant areas to the south of the proposed alignment identified as Ancient Woodland. These areas make a major contribution to the existing landscape character of the area and strongly influence the extent of the area from which the proposed scheme is likely to be visible from.
- 10.2.4. At the national level, the Scheme is identified within Natural England's National Character Area 122: High Weald. This concludes that the '*pastoral, heavily wooded and intimate character of the landscape has a strong sense of tranquillity.*' The existing tranquillity of the area has been identified by the East Sussex County Landscape Architect as one of the key issues for consideration.



- 10.2.5. At the local level, the alignment of the Scheme spans two of the Local Landscape Character Areas identified by the East Sussex County Landscape Assessment 2010. It lies predominantly within the 'Lower Rother Valley' Local Landscape Character Area, with the western end around to Robertsbridge situated in the 'Upper Rother Valley' area. This assessment is currently being updated to include recommendations relating to appropriate landscape management. Any mitigation measures that are identified as part of the Scheme will therefore endeavour to be compatible with this emerging guidance.
- 10.2.6. The proposed track would be located on the existing dismantled railway line which passes close to a Scheduled Monument at Robertsbridge Abbey (Grade 1). The railway line and the Scheduled Monument are separated by the River Rother. There are also two Conservation Areas (within which are a number of Listed Buildings), close to the Scheme, located at Robertsbridge and Northbridge Street. Parts of these areas have views towards sections of the Scheme, with the Northbridge Street area in particularly lying close to the proposed alignment.
- 10.2.7. There are a number of residential properties in the study area, particularly located to the north of the Scheme on the edge of Salehurst and at Northbridge Street. Some of these may have views of the proposed railway line and passing trains as may other nearby rural properties. There are footpaths and bridleways along the river valley to the south of the Scheme and crossing over the line to the north, which would have varying views of the proposed railway line and passing trains.
- 10.2.8. **Figure 2 (Appendix 1)** shows the approximate locations for representative views towards the site. It is anticipated that 15 to 20 viewpoints will need to be assessed. The locations of the viewpoints will be refined and agreed in consultation with the LPA as part of the assessment.
- 10.2.9. Panoramic photographs will be presented for each of the selected viewpoints. These will be accompanied by a table and a location plan that will provide the following assessment:
- A description of the location (receptor);
  - The approximate distance from the viewpoint to the application boundary;
  - A location map of the viewpoint;
  - A description of the existing view and the components of the predicted view during and after development;
  - A determination of the sensitivity of the receptor and the magnitude of impact;
  - An identification of potential mitigation measures to avoid, reduce, or compensate for the anticipated impacts; and
  - A summary of the significance of the overall residual impact (adverse or beneficial).
- 10.2.10. **Figure 2 (Appendix 1)** also shows where the original/ proposed alignment of the railway intersects existing roads and public right of ways and the location of groups of residential properties with potential views towards the Scheme. The assessment will consider impacts on these groups of receptors and how best to mitigate any adverse impacts. Wherever possible these assessments will be undertaken from the affected properties, but where this is not achievable due to the lack of agreed access, the anticipated impacts will be interpolated from nearby public viewpoints.



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## 10.3. Potential Impacts

10.3.1. Potential impacts of the Scheme can be broadly categorised into those that will incur during construction (temporary) and those that remain once the Scheme has been commissioned and is in operation (permanent). Temporary landscape and visual impacts during construction may include:

- Visual effects associated with construction activities and plant;
- Introduction of temporary access roads and construction compounds, which may include spoil/material stockpiles;
- Removal of semi natural and natural vegetation including trees and hedgerows; and
- Temporary changes to the local landscape character as a result of the above.

10.3.2. Permanent impacts during the operational period may include:

- Modifications to local landforms as a result of the re-establishment of the track and the associated infrastructure;
- The visual effects associated with loss of mature trees along the disused railway line and for the proposed Salehurst Halt;
- Visual effects associated with permanent land-take and the re-establishment of the track and the associated infrastructure, including bridges and road crossings;
- The visual effects associated with operational use of the line by steam trains, (which may be beneficial or adverse as the Scheme is an historic restoration of a steam railway);
- Provision of new planting or other mitigation measures; and
- Permanent changes in the landscape character as a result of the above.

## 10.4. Evaluation of Impacts

10.4.1. The extent of the study area will be determined by the Zone of Theoretical Visibility (the extent of the area from which the proposed development may have an influence or effect on visual amenity). Potential impacts will be considered during the construction and operational phases. A worst case situation (i.e. in winter when the site is at its most visible) will be assumed for assessment of potential impacts during the construction phase and in year one of operation. For the operational stage, residual impacts will be assessed in year 15 (when the landscaping mitigation measures are expected to be fully established).

10.4.2. The overall significance of landscape effects will be determined by combining the separate judgements about the sensitivity of the landscape receptors and the magnitude of the landscape effects of the proposals. A higher level of significance is generally attached to large-scale effects and effects on sensitive or high-value receptors. Consequently, small effects on highly sensitive sites can be as important as large effects on less sensitive receptors. Effects on landscape character will be identified by assessing the impact on the elements or resources that contribute to the overall character of the area. The magnitude of impact will be assessed in terms of the scale of change to the landscape resource, the nature of effect and its duration.



- 10.4.3. The overall significance of visual effects will be determined by combining the separate judgements about the sensitivity of the receptor and the magnitude of change to the composition or character of a view. The magnitude of impact will be assessed in terms of the scale of change to the viewer, the nature of effect and its duration and the overall effect on visual amenity.
- 10.4.4. In order to determine the significance of both the landscape and visual impacts, the sensitivity of the receptors and the magnitude of the predicted effects will be combined as set out in the Significance Matrix in **Table 3.1**. The following provides examples of the approach which will be taken in the assessment:
- 10.4.5. The potential cumulative landscape effects of the Scheme will be considered against any other large scale schemes that are identified within the area during the course of the assessment. These will consist of schemes with planning consent or planning applications that have not yet been determined within the study area.
- 10.4.6. Potential beneficial effects due to the historic value of the restored railway, the interest it will generate and increase in viewers enjoying the character of the steam railway and the surrounding landscape will be considered as part of the evaluation of impacts.

## 10.5. Mitigation and Residual Effects

- 10.5.1. Where potentially significant effects have been identified, consideration will be given to how such effects can be mitigated. Potential mitigation options may include:
- Screening through use of replanting, reinstatement of trees and hedgerows;
  - Screening through use of earth bunds; or
  - Enhanced design, to create structures that are visually pleasing and/or sympathetic to the surrounding environs.
- 10.5.2. It is anticipated that the detail of the proposed mitigation measures will be refined in consultation with the LPA and other local stakeholders in order to respond to the conclusions of the baseline assessment and the emerging guidance in the County Landscape Character Assessment.
- 10.5.3. Landscape and visual amenity impacts may also need to be assessed relating to potential mitigation measures that need to be incorporated into the design identified by other environmental disciplines. These measures will be set out in the relevant discipline section of the Environmental Statement.

## 10.6. Assumptions and Limitations

- 10.6.1. The assessment will be based on the following assumptions:
- basic good practice will be used to reduce the potential impacts of works and construction sites, such as the use of cut-off lighting or down lighting and hoardings as set out within the CEMP;
  - Planting will be provided wherever it would mitigate a significant effect and would be both feasible and appropriate. However, there may be, at the time the assessment is undertaken, uncertainties over planting details and species choices which will only be agreed as part of detailed design;



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- At the time the assessment is undertaken there may be uncertainties as to the exact types and location of construction plant, quantities of materials used, and precise construction programme. Where this is fundamental to the conclusion of the assessment, assumptions that incorporate a reasonable worst case will be clearly stated; and
  - Where new structures (bridges) are proposed, it is assumed that these will be appropriately designed to fit with the shape and scale of its context so that views are not significantly altered. However, the level of design detail available for Scheme components, e.g. final finishing materials and colour will not necessarily be known at the time of the assessment.

10.6.2. The following limitations may apply to the assessment:

- The alignment of the original/proposed railway is in private ownership. Where permission to enter the land is not forthcoming, the baseline assessment will be undertaken from adjacent public rights of way and using recent aerial photographs of the site; and
- Wherever possible, the assessment of impacts to the visual amenity from private residential viewpoints will be undertaken from the affected properties, but where this is not achievable due to the lack of access, the predicted impacts will be interpolated from nearby public viewpoints.

10.6.3. It is not anticipated that these limitations will significantly influence the overall conclusions reached by this assessment.



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## 11. NOISE AND VIBRATION

### 11.1. Introduction

11.1.1. This section describes the scope and proposed methodology for the assessment of impacts of potential noise and vibration impacts associated with the construction and operation of the Scheme. The scope has been identified following a review of the receiving environment and proposals and a review of best practice of noise assessment for rail schemes.

11.1.2. In undertaking the preliminary assessment for this scoping report, consideration has been given to the policies and procedures set out by various authorities, governmental and regulatory bodies, as appropriate, these include but are not limited to:

- Department for Transport: Transport Analysis Guidance Unit 3.3.2 – Noise;
- Department for Transport: Calculation of Railway Noise, 1995;
- Department for Transport: Calculation of Road Traffic Noise, 1988;
- BS 5228 – Noise and Vibration Control on Construction and Open Sites;
- BS 4142: 1997 – Method for Rating industrial Noise Affecting Mixed Residential and Industrial Areas;
- BS 8233: 1999 – Sound Insulation and Noise Reduction for Buildings;
- Noise Insulation (Railway and Other Guided Transport Systems) Regulations, 1996; and
- EC Noise Directive on Environmental Noise (Directive 2002/49/EC).

11.1.3. The detailed assessment will consider a number of sensitive receptors that could potentially be affected by noise and vibration associated with the proposed Scheme. These could include residential dwellings, commercial premises, libraries, public open spaces, and other sensitive land uses.

### 11.2. Current Baseline

11.2.1. Some sensitive receptors located in the area surrounding the Scheme are already likely to be subject to potentially significant noise and vibration from existing sources as detailed below:

- Noise and vibration from passing rail traffic on the existing Hastings Line at Robertsbridge;
- Noise from nearby roads including the A21, B2244 and other local traffic routes; and
- Noise from existing agricultural and domestic activities close to sensitive receptors.

11.2.2. No previous noise surveys have been undertaken for the Scheme, therefore no baseline information is currently available.

11.2.3. The existing baseline noise levels around the Scheme will be established through a detailed monitoring exercise. It is proposed that continuous noise monitoring is completed at up to 4 locations representative of nearby noise sensitive receptors for a period of not less than 7 days. The location of monitoring sites has been discussed with Rother District Council's Environmental Health Officer.



- 11.2.4. In addition shorter duration attended noise measurements will be completed at up to 3 locations representative of noise sensitive receptors around the Scheme.
- 11.2.5. All measurements will be made in terms of broad band A-weighted and octave band  $L_{eq}$ ,  $L_{max}$ ,  $L_{10}$  and  $L_{90}$ . All noise monitoring will be completed in accordance with BS7445 '*Description and measurement of environmental noise – Part 1: Guide to quantities and procedures*'.
- 11.2.6. Based on interrogation of aerial photography and mapping data potentially sensitive receptors will be identified in the area surrounding the Scheme, including:
- Properties and sensitive receptors in villages adjacent to and surrounding the proposed rail line including at Robertsbridge and Salehurst; and
  - Isolated residential properties and commercial/agricultural operations situated around the Scheme.
- 11.2.7. At this stage of the Scheme ecological surveys are still to be completed, however, it is possible that noise and vibration sensitive wildlife may exist in the surrounding area. Information from the noise assessment will therefore be shared with the ecology team to allow a comprehensive assessment to be undertaken.

### 11.3. Potential Impacts

- 11.3.1. The effects which may be observed as a result of noise impacts associated with the Scheme are summarised below:
- Interference with speech intelligibility;
  - Interference with task performance (commercial and social activities);
  - Annoyance; and
  - Disturbance of wildlife.
- 11.3.2. The potential effects which may be observed as a result of any vibration associated with the Scheme are summarised below:
- Perceptible vibration;
  - Groundborne noise (or re-radiated noise); and
  - Disturbance of wildlife.
- 11.3.3. All vibration sensitive receptors are more than 60m away from the proposed Scheme; at these distances vibration effects are unlikely at any of these receptors.
- 11.3.4. Therefore, no significant adverse vibration impacts are anticipated with the operation of the proposed scheme and, accordingly, the assessment of operational vibration impacts is proposed to be scoped out of the EIA.

#### Construction

- 11.3.5. Noise and vibration impacts have the potential to arise as a result of construction activities associated with the Scheme, and are identified below:



- Increased noise and vibration levels at sensitive receptors as a result of construction operations (including potential night-time works associated with level-crossing works on the highways);
- Increased noise and vibration levels at sensitive receptors as a result of increases in traffic (including HGVs) on the surrounding road network associated with the construction works; and
- Activities within construction compounds.

11.3.6. The extent of any potential impacts arising from construction noise will vary greatly depending upon the scale and nature of the works. General construction assumptions will be utilised to predict free-field noise contours from principal work sites. This will be used, in combination with measured baseline noise levels to establish an approximate zone of influence of construction noise on sensitive receiver locations.

### Operation

11.3.7. Noise impacts may arise as a result of the operation of the Scheme. Potential impacts include:

- Potential increase or decrease in noise levels at sensitive receptors as a result of trains running along the proposed new sections of rail line.

11.3.8. It should be noted that train operations will be limited to daytime hours, as defined in **Table 11.2**.

## 11.4. Evaluation of Impacts

### Construction

11.4.1. Based on experience derived on other major UK rail projects, vibration impacts will be limited to sensitive receptors in relatively close proximity to the Scheme. Construction vibration associated with the proposed Scheme will be assessed in accordance with BS5228 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration' BS7385 'Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration' and based on our previous experience of similar Schemes.

11.4.2. The extent of any potential impacts arising from construction noise will vary greatly depending upon the scale and nature of the works. General construction assumptions will be used to predict free-field noise contours from principal work sites. This will be used, in combination with measured baseline noise levels, to establish an approximate zone of influence of construction noise on sensitive receiver locations.

11.4.3. Construction noise impacts will be calculated in accordance with BS5228 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise* and assessed for day, evening and night periods, in accordance with the evaluation criteria set out in **Table 11.2**.

11.4.4. Except where otherwise stated, the construction noise evaluation criteria shall apply to residential buildings and to daytime thresholds for occupied non-residential buildings. The evaluation criteria for construction noise at night is only relevant for residential buildings in this case and only as relevant.



**Table 11.1 - Construction Noise – Thresholds of Significant Impacts**

Assessment Category and threshold value period, ( $L_{Aeq}$ )	Threshold value, in decibels (dB)		
	A	B	C
Night-time (2300-0700)	45	50	55
Evening and Weekends*	55	60	65
Daytime (0700-1900)	65	70	75
<p>Note 1 - A significant effect has been deemed to occur if the total <math>L_{Aeq}</math> noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level</p> <p>Note 2 – If the ambient noise level exceeds the threshold values given in the table i.e. the ambient noise level is higher than the above values, then a significant effect is deemed to occur in the total <math>L_{Aeq}</math> noise level for the period increases by more than the 3 dB Due to construction activity.</p>			
<p>*1900-2300 Weekdays, 1300-2300 Saturdays and 0700-2300 Sundays.</p> <p>Category A: threshold values to use when ambient noise levels (when rounded to the nearest 1dB) are 5dB or more below the Category A values.</p> <p>Category B: threshold values to use when ambient noise levels (when rounded to the nearest 1dB) are 5dB or more below the Category B values.</p> <p>Category C: threshold values to use when ambient noise levels (when rounded to the nearest 1dB) are 5dB or more below the Category C values.</p>			

- 11.4.5. Any noise associated with increased traffic on the surrounding road network will be calculated in accordance with the Department of Transport 'Calculation of Road Traffic Noise' (CRTN) document and any potential impacts as a result of off-site road traffic will be evaluated in accordance with the Highways Agency '*Design Manual for Roads and Bridges*' (DMRB).

## Operation

- 11.4.6. The operational noise assessment will be completed for the year of opening of the Scheme (2018) as it is assumed that the full running timetable will be implemented within the first year.
- 11.4.7. The assessment of operational noise impacts will be carried out up to a distance of 300m from the railway and may be limited further by having regard to the threshold values and information contained within the CRN and '*Noise Insulation (Railways and Other Guided Transport Systems) Regulations*' (NIRR) (1996) documents.
- 11.4.8. Operational noise impacts will be assessed by comparing noise levels at sensitive receptors before and after the Scheme becomes operational. For purposes of this assessment it is considered that an increase or decrease of 3 dB or more in the ambient noise level pertaining to the relevant period  $L_{Aeq}$  is deemed to represent a significant impact, see also **Table 11.2**.



**Table 11.2 - Criteria for Determining Operational Noise impacts**

Operational Rail Noise change (07:00 – 23:00) day, and (23:00 - 07:00) night	Description of Change	Scale Rating
Decrease of more than 3dB	Slight	Significant beneficial impact
-3 dB < noise change < 3 dB	No significant change	
Increase of 3-5 dB	Slight	Significant adverse impact
Increase of 5-10 dB	Moderate	
Increase of more than 10dB	Substantial	
Note: A cut off threshold of 50dB <sub>L<sub>Aeq</sub></sub> (16hr day) and 45dB <sub>L<sub>Aeq</sub></sub> (8hr night) has been used for the purposes of the assessment. The noise assessment has been based on external noise levels at 1m from the façade.		

- 11.4.9. Significant effects for non-residential properties shall be determined by considering the severity of potential impacts and the sensitivity of the utility of the resources affected.
- 11.4.10. Alternative criteria may be applicable for non-residential noise sensitive receptors, however, generally the noise change significance detailed in the preceding table would be applied during the daytime assessment period.
- 11.4.11. In addition to the assessment of noise impact at sensitive receptors near to the Scheme, an assessment of properties that may be eligible for noise insulation under the NIRR shall also be carried out. The daytime period in this case shall be 06:00 – 24:00 hours whilst the night-time period shall be 24:00 – 06:00 hours.
- 11.4.12. It should be noted that the NIRR only apply to new or altered railways and do not apply to existing operating railway infrastructure.
- 11.4.13. The impact of operational noise on sensitive wildlife will be examined as part of the ecological impact assessment.

## 11.5. Mitigation and Residual Effects

- 11.5.1. As part of the noise and vibration impact assessment suitable mitigation measures will be considered where significant impacts are identified and a noise and vibration mitigation hierarchy will be adopted similar to that identified in **Plate 3.2** of this report.

## 11.6. Assumptions and Limitations

- 11.6.1. The following limitations have been identified:

- As the rolling stock likely to operate on the new section of railway is not included in CRN, source measurements of representative trains under conditions specified by CRN will be obtained to allow operational noise levels to be predicted.

- 11.6.2. Noise from moving trains will be predicted using the method detailed in Department of Transport memorandum Calculation of Railway Noise, 1995, with the following exceptions:

- Inclusion of the effects of noise from on-board equipment such as auxiliary equipment; and
- Effects of trains travelling less than 20 km/h.

- 11.6.3. The following assumptions have been identified:



- In order to predict noise impacts associated with the operational stage of the Scheme detailed information regarding rail traffic patterns and speeds will be required;
- Construction activities will be carried out according to the methods and programmes defined by the project design team. This includes assumptions concerning any work which may have to be carried out during the night;
- Measures to reduce or mitigate the effects of noise and vibration will be carried out where reasonably practicable and cost effective in line with best practicable means (BPM); and
- At the EIA stage of a scheme detailed construction phasing and works information may not be available. However, quantitative assessments of 'typical' and 'worst case' construction noise/vibration impacts can be completed based on experience of similar schemes.



## 12. TRANSPORT AND ACCESS

### 12.1. Introduction

12.1.1. This section describes the proposed scope and methodology for the assessment of potential transport and access impacts associated with the construction and operation of the Scheme. It will discuss construction and operation of the scheme separately, although some of the potential mitigation measures may offset the impacts of both phases.

12.1.2. For the construction phase, it is necessary to consider the transport impacts of:

- Transport and storage of plant and materials, by rail and road, for construction of the track bed, track, new bridges and new halt at Salehurst;
- Frequency, location and intensity of construction routes used, including types of vehicles being transported;
- Timing and programming of level crossing construction; and
- Impacts affecting safety and amenity on road traffic and non-motorised road users, including on the Public Rights of Way network.

12.1.3. For the operational phase, it will be necessary to consider:

- Traffic impacts arising from additional demand generated by completion of the railway, including their location, timing and mode of arrival; and
- Operational and safety impacts of the road-based level crossings and those crossing Public Rights of Way.

### 12.2. Current Baseline

12.2.1. The Scheme is to be constructed between Robertsbridge and Bodiam. The route crosses Northbridge Street, Robertsbridge, A21 (trunk road) and B2244 Junction Road. It also crosses a bridleway at Salehurst, a public footpath just east of A21 and two public footpaths in the vicinity of Robertsbridge (see **Appendix 1**).

12.2.2. There are two relevant highway authorities – the Highways Agency for A21, and East Sussex County Council (as ‘highway authority’) for other routes. Both are statutory consultees. The planning authority is Rother District Council.

12.2.3. Level crossings are required at each vehicular crossing point (3 no.) and pedestrian crossing points are required at each point the route crosses a footpath or bridleway (4 no.). Alternatively, the routes may be Stopped Up subject to consultation and consent.

12.2.4. No level crossings or pedestrian crossing points are currently present at any of the proposed crossing points, although some historic infrastructure is apparent at certain locations.



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- 12.2.5. A study was completed in 2011 by Mott Macdonald<sup>13</sup> to assess the impacts of new level crossings at the three vehicle crossing locations on Northbridge Street, A21 Robertsbridge Bypass and B2244 Junction Road. This study made an assessment of the following issues at each location:
- Queue lengths and increases in traffic delays;
  - Safety;
  - Traffic speed and speed limits; and
  - Potential for diverted traffic.
- 12.2.6. A number of mitigation measures were identified, including the potential for speed limit changes on the A21 and B2244 and traffic separation on the A21.
- 12.2.7. Subsequent discussions with the Office of Rail Regulator and Highways Agency have indicated No Objection in Principle (from the ORR) to the level crossings, and agreements on road safety management measures at the A21 crossing.
- 12.2.8. Current traffic levels are contained within the 2011 report and these will be used as the basis for further assessment. No pedestrians or cyclists were observed during the collation of that report, and this is confirmed by recent site investigation. A Non-Motorised User (NMU) Audit has also been completed in respect of the A21.
- 12.2.9. It is considered that the operational impacts of the 3 vehicular level crossings have been adequately assessed, subject to the caveats contained within the 2011 Mott Macdonald report, and therefore require no further consideration in this assessment. As such, it is proposed to 'scope out' the assessment of traffic impacts associated with the operation of the level crossings.
- 12.2.10. No operational assessments have been made of the 4 footpath crossings. Investigation of the location (or relocation) of the proposed crossings *vis a vis* pedestrian safety, crossing layout and design is therefore required.
- 12.2.11. Planning consent for the reconstruction of Robertsbridge railway station was granted in December 2012 (RR/2012/1357/P). This has been accepted on the basis of all new passengers arriving by National Rail (South Eastern) services or other public transport, with no new car parking allowance except for 3 operational spaces. Currently, parking is only permitted at Northiam and Tenterden Stations. Initial observations indicate that Robertsbridge car park (75 spaces) is currently approximately 85-90% occupied during weekdays (by users of the mainline services).

## 12.3. Potential Impacts

- 12.3.1. The potential traffic impacts will be assessed in terms of construction and operational phases.
- 12.3.2. For the construction phase, the impacts are likely to occur as:
- Large or long vehicles being transported to and from the site on the existing road network. Some sections of the network, particularly away from the A21 trunk road, are rural roads potentially unsuitable for large or long vehicles;

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<sup>13</sup> Mott MacDonald (October 2011) Rother Valley Railway: Proposed Level Crossings. Traffic Impact Study



- Transportation of materials to and from site in terms of size and frequency of HGV movements, and sensitivity of routes used;
- Temporary road closures resulting from the need to construct level crossings. Consideration is necessary of length and timing of closure and alternative routes for all vehicle types;
- Temporary closure or diversions of Public Rights of Way;
- Safety at level crossing sites during construction when road closures are not necessary;
- Assessment of site access points in terms of location, suitability, safety, visibility and frequency of use; and
- Deposition of mud and other building site material on the highway network, close to site access points.

12.3.3. Notwithstanding the statement in 12.2.9, the operational phase impacts are likely to be:

- Safe operation of pedestrian crossing points at Public Rights of Way; and
- Adequate and safe pedestrian links from new stations to their local communities (Robertsbridge and Salehurst).

## 12.4. Evaluation of Impacts

12.4.1. The evaluation of impacts will be based on an assessment of their magnitude and the importance of the affected resources/receptors. Professional judgement and experience will be used to make an overall assessment. The area covered by the assessment will be agreed with the highway authorities.

12.4.2. The potential impacts described previously will be explored in discussion with construction and operational teams to assess the:

- Road routes for transportation of construction plant and materials;
- Construction programme and key milestones, particularly road closures required for level crossing construction;
- Construction methods, including assessing the level of construction activity that may be undertaken from the rail network;
- Storage and accommodation areas for plant and materials, including the suitability of access to the road network;
- Likely frequency of use of road haulage routes; and
- Layout, construction and control of pedestrian crossings in accordance with relevant guidance.

## 12.5. Mitigation and Residual Effects

12.5.1. It is anticipated that many of the construction effects are likely to be minimal/neutral provided the construction programme is agreed in advance with the highway authorities (Highways Agency and East Sussex County Council).

12.5.2. Some mitigation works may be necessary at the Public Rights of Way crossing points to maintain pedestrian and rail network safety.



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## 12.6. Assumptions and Limitations

12.6.1. Satisfactory completion of the construction impact assessment relies on more detailed understanding of construction methods and programme. The assessment will be completed upon the best available information on:

- Estimates of construction traffic associated with the Scheme;
- Expected compound locations and their access locations to the highway network;
- Expected origin and destination of construction traffic; and
- Committed and planned developments in the area that may affect traffic levels and routing within the study area.



## 13. WATER QUALITY, HYDROLOGY AND HYDROGEOLOGY

### 13.1. Overview

13.1.1. This section describes the scope and methodology for the assessment of potential effects on water resources associated with groundwater, surface water and flooding during the construction and operation of the Scheme.

13.1.2. A flood risk assessment (FRA) has already been produced in accordance with the requirements of *NPPF: National Planning Policy Framework*<sup>14</sup> and the *NPPF Technical Guidance*<sup>15</sup>.

13.1.3. The environmental assessment of impacts to the water environment will be carried out following the requirements below:

- Identify the baseline conditions, to record the existing quality of the water environment, the uses and any areas vulnerable to change;
- Consider the effects of climate change on the baseline over the lifetime of the project;
- Assess the changes to the baseline conditions as a result of the project; and
- Identify the mitigation measures required.

### 13.2. Current Baseline

13.2.1. A baseline study has been carried out to establish the existing surface water regime, including drainage patterns, and to assess its sensitivity to the construction and operation of the Scheme. It has used data collected relating to hydrology, historical flood records, tides, surface water quality, water abstraction locations and land drainage systems.

13.2.2. The following information has been obtained:

- Data on surface water quality from the Environment Agency and published sources;
- Data on flood flows and water levels from the Environment Agency and published sources;
- The Flood Estimation Handbook (CD-ROM Version 3);
- Sewer asset plans from statutory undertakers;
- Published data collected by the Institute of Hydrology and British Geological Society;
- Walkover survey, and
- Information compiled as part of any investigative works associated with the project.

13.2.3. Additional and supplementary information on surface water features has been obtained from Ordnance Survey (OS) maps, site surveys and aerial photographs.

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<sup>14</sup> Communities and Local Government (March 2012) National Planning Policy Framework

<sup>15</sup> Communities and Local Government (March 2012) Technical Guidance document to the National Planning Policy Framework



- 13.2.4. A separate FRA has been undertaken for the Scheme in accordance with the NPPF as the site is greater than 1ha in area and the proposed realignment is within Flood Zone 3. Information from this, where it pertains to the impact of the scheme on flood risk, will be considered as part of the EIA. As part of this FRA, consultation with the Environment Agency and local authorities will be required to establish information available in terms of flood modelling data and historical data for all flood mechanisms affected by the proposals. Early discussions with the EA are critical to establish options available for mitigation especially the loss of flood storage volume due to the development and any impact on flood routing. The FRA will also include bespoke detailed hydraulic modelling of the River Rother catchment to quantify the impact of the project on flood water flows and levels.
- 13.2.5. Any consideration of the significance and magnitude of potential impacts to the water environment have had regard to the NPPF and the Water Framework Directive<sup>16</sup>. The Environment Agency *Policy and Practice for the Protection of Groundwater* has been followed.

### Surface water

- 13.2.6. The River Rother and its tributaries are the only watercourses that would be affected by the proposed development. The River Rother flows from west to east, North of Robertsbridge and then meanders eastwards towards Bodiam.
- 13.2.7. The River Rother is classified as an Environment Agency Main River. Maintenance responsibilities for these watercourses remains with the riparian owners, however the Environment Agency has powers under the Water Resources Act 1991 to maintain and improve Main Rivers in order to ensure the efficient passage of flood flow and to manage water levels.
- 13.2.8. Preliminary desk studies have not identified any section of the Scheme as being a Site of Biological Importance.
- 13.2.9. The proposed alignment for the Scheme would require watercourse crossings over tributaries of the River Rother and the River Rother itself, therefore watercourse diversions may be required, although as the Scheme is a reinstatement of the former railway it is hoped these can be avoided.

### Groundwater

- 13.2.10. The site is situated on a secondary undifferential bedrock aquifer. This is associated with aquifers that have been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. Superficial drift deposits surrounding the River Rother are secondary (A) aquifers, which support water supplies at local rather than strategic scale. The proposed alignments are not within Environmental Agency groundwater source protection zones.

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<sup>16</sup> The Water Framework Directive applies to all surface freshwater bodies (including lakes, streams and rivers), groundwaters, groundwater dependant ecosystems, estuaries and coastal waters out to one mile from low-water.



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## Flood Risk

- 13.2.11. The proposed alignment crosses the 1 in 100 year or greater (1% annual exceedance probability) floodplain (Flood Zone 3). This flood zone relates to the River Rother. NPPF requires that any development in the floodplain is safe for future occupants and does not increase flood risk elsewhere. The proposed route and junction realignment necessitates multiple crossings of the floodplain and floodplain compensation may be required for the works.
- 13.2.12. The Environment Agency Flood Zone Maps do identify formal flood defences or flood alleviation measures in the Robertsbridge area which will be considered.
- 13.2.13. The morphology of the land and drainage patterns will need to be considered. Key receptors include any areas that may be affected by changes in overland flow routes and the surface water flow regime on the site. This includes areas potentially at significant distances from the site which may be subject to increased flooding due to an increase in overland flows from the site or from changes to flow patterns through the site.
- 13.2.14. Non-natural or artificial sources of flooding can include reservoirs, canals and lakes where water is retained above natural ground level, operational and redundant industrial processes including mining, quarrying and sand and gravel extraction. The potential effects of flood risk management infrastructure and other structures also need to be considered. Flooding from artificial sources may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.
- 13.2.15. On developed sites rainwater is frequently drained into surface water sewers or sewers containing both surface and waste water known as “combined sewers”. Flooding can result when the sewer is overwhelmed by heavy rainfall, becomes blocked or is of inadequate capacity, and will continue until the water drains away. When this happens to combined sewers, there is a high risk of land and property flooding with water contaminated with raw sewage as well as pollution of rivers due to discharge from combined sewer overflows.

## 13.3. Potential Impacts

### Construction

- 13.3.1. Potential impacts from construction of the Scheme include the following:
- Direct discharges (accidental or otherwise) of drainage or effluent from construction sites to groundwater or surface waters;
  - Increased sedimentation of surface watercourses as a result of construction site run-off;
  - Temporary changes to drainage patterns and overland flow routes due to construction works as a result of construction of bridges and culverts;
  - Changes to groundwater and surface water quantities and flows resulting from temporary dewatering schemes;
  - Temporary modification, diversion or removal of existing artificial water bodies to facilitate construction of the Scheme;
  - Temporary modification, diversion or removal of existing surface and foul water infrastructure to facilitate construction of the Scheme; and
  - Groundwater interaction with possible areas of contamination through cutting and remobilisation of contaminants.



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## Operation

13.3.2. Potential impacts from the operation of the Scheme include the following:

- Permanent changes to flows and conveyance in watercourses at culverts and bridges, including the potential for blockage in critical areas;
- Permanent loss of floodplain and flood storage capacity;
- Changes in overland flow routes resulting from the vertical and horizontal alignment of the new route;
- Changes in drainage (flow rate and volume) and infiltration patterns (including groundwater recharge) due to additional areas of permanent hard-standing and other drainage arrangements;
- Changes to groundwater quantities and flows resulting from permanent dewatering schemes or from obstructions to groundwater flow created by the features constructed as part of the scheme where these take place below ground;
- Changes in groundwater quality due to changes in the hydro-geological status of the area of study as a result of the Scheme;
- Permanent modification, diversion or removal of existing artificial water bodies as a result of the Scheme;
- Permanent modification, diversion or removal of existing surface and foul water infrastructure as a result of the Scheme; and
- Change in access imposed by the development and the ability to construct new flood defence structures in the future, necessary to protect existing properties and as a consequence of global climate change.

## Effects on Water Resources

13.3.3. Potential soil and water effects include:

- Reduction in the value and function of water features due to changes in morphology or water quality;
- Increased level, frequency or recession times of local flooding due to increased sedimentation of watercourses (during construction) or changes to land drainage (temporary and permanent);
- Increased permanent risk of flooding due to loss of floodplain and flood storage capacity;
- Increased permanent risk of flooding due to changes in groundwater flows;
- Increased permanent risk of downstream flooding due to change in run-off characteristics from impervious surfaces;
- Increased fluvial flood levels, intensity and extended recession times due to reduction in flow conveyance and changes in channel and floodplain characteristics;
- Effects on future flood defence management and maintenance regimes;
- Reduced groundwater recharge due to reduced infiltration and implications for abstractive uses including public, private and industrial water supplies;



- Change in potential for risks to health of future site users and integrity of buried structures from exposure to contaminated soils or groundwater;
- Change in quality of surface water or groundwater from exposure to contaminated soils or groundwater, with consequent impacts on dependent ecosystems; and
- Change to groundwater levels, flows into groundwater fed streams, ditches or springs due to creation of barriers to groundwater movement.

## 13.4. Evaluation of Impacts

13.4.1. There are no defined significance criteria for the assessment of water resources. Thus the impacts have been assessed against the criteria described below, which are based on those within the DfT's *Transport Analysis Guidance* (Unit 3.3.11)<sup>17</sup>. The overall impact of the proposed rail link has been summarised in an evaluation summary table, although the evaluation of the impact significance has been developed beyond that set out in this summary table.

13.4.2. The value of water resources is in part defined by legislation which protects all controlled waters in England and Wales and which, in effect, protects all water bodies (surface or groundwater). Thus there cannot be a water feature that has negligible value. However the value of controlled waters can be defined outside of the legal status by taking into account the use and conservation importance of the water body. This is set out in **Table 13.1**.

**Table 13.1 - Criteria for Determining Value of Water Features**

Value	Criteria	Examples
Very High	High importance and rarity, international scale and limited potential for substitution.	Internationally shared water resources. Catchments used for interbasin transfers. Water resources that perform major function in relation to internationally protected sites (SPA, SAC, RAMSAR site).
High	High importance & rarity, national scale, or regional scale with limited potential for substitution.	Water resources used for major potable supplies i.e. by a water supply utility with limited potential for substitution. Water resources that perform major function in relation to nationally protected sites (SSSI).
Medium	Medium importance and rarity, local or regional scale, and some potential for substitution.	Locally important water resources used for public water supplies but which can be substituted. Private water supplies or properties. Water resources that perform major function in relation to regionally important sites (SINCs, SNICs etc).
Low	Low or medium importance and rarity, local scale. Good potential for substitution.	Controlled waters with limited potable use, or limited input to sensitive or important ecosystems.

13.4.3. The magnitude of an impact can vary considerably and should also consider the timescale over which the impact occurs. The impact must be defined as temporary or permanent and whether it is reversible or not. Typical criteria are set out in

<sup>17</sup> DfT (2003) Transport Analysis Guidance, Unit 3.3.11 The Water Environment Sub-Objective.



**Table 13.2 - Criteria for Determining the Magnitude of Impact**

Magnitude	Typical Criteria
Major negative/positive	The proposal (either on its own or with other proposals) may affect the integrity of the water body either in terms of quality or quantity and could render it permanently unusable, or such it would require substantial permanent treatment to ensure it was useable by existing or future users.  The function of the water body is impacted such that there is a substantive and permanent change (+ve/-ve) in function e.g. as a means of transmitting flood flows.
Intermediate negative/positive	The quality or quantity of the water body would be reduced (or improved) such that moderate works would be required to ensure continuity of its existing use or function.  The function of the water body is impacted such that there is a moderate and measurable change (+ve/-ve) in function (e.g. as a means of transmitting flood flows).  Or, a major impact that only affected the water body for a limited time frame and was reversible and could be mitigated by some temporary works.
Minor negative/positive	The impacts would affect the quantity or quality but in a manner which did not materially affect its use or function.
Neutral	No observable impact on use of function.

13.4.5. The following table the magnitude and conservation value “scores” are combined to determine the overall effect category, as set out in **Table 13.3**. If the effect is negative then the final category is adverse, if the effect is positive then the final category is beneficial. Any effect of moderate or greater importance has been deemed significant.

**Table 13.3 - Evaluating the Effect**

Magnitude of Potential Impact	Value of water bodies			
	Very high	High	Medium	Low
Major negative/positive	Very large	Very large	Moderate	Slight
Intermediate negative/positive	Large	Large	Moderate	Slight
Minor negative/positive	Slight	Slight	Slight	Very slight
Neutral	Neutral	Neutral	Neutral	Neutral

13.4.6. The study area can be defined as the surface water catchments through which the Scheme will pass and that will potentially be affected by the elements of work. It also considers the groundwater catchments in the area.

13.4.7. The assessment will consider impacts on:

- Surface waters and drainage patterns within 250m of the boundary of the limits of deviation and implications for catchment management;
- Any abstractors using surface water, or other users of surface water; and
- Aquifers and groundwater abstractions located within a 500m radius from work sites.

13.4.8. Effects on surface water have been considered in relation to both construction (2016 to 2018) and operation, starting in 2018.



13.4.9. This includes impacts associated with the construction phase that may have effects persisting in the long term e.g. changes in river morphology due to gradual deposition of sediment.

13.4.10. In all cases the assessment has been mindful of the implications for flooding of climate change, as is required by NPPF.

## 13.5. Mitigation and Residual Effects

13.5.1. The primary potential impact of the Scheme in terms of flood risk relates to the proposed multiple river crossings. The crossings will be designed to minimise the impact on flood risk, with soffit levels set at least 300mm above the 1 in 100 year +20% flood water level in accordance with the Environment Agency standing advice. The watercourses will be diverted locally and floodplain compensation will be provided where necessary to ensure that the river crossings do not increase flood risk upstream or downstream. Secondary sources of potential flooding such as; groundwater, surface water, sewers and artificial water bodies will also be considered with appropriate mitigation provided to ensure that the Scheme does not increase flood risk elsewhere. Surface water runoff rates and volume will be restricted to existing levels.

13.5.2. Runoff from construction sites will be appropriately managed to ensure minimal impacts before discharge to a suitable outfall. Groundwater recharge will be prioritised provided ground conditions meet relevant criteria. Sustainable Drainage Systems will also be used wherever possible to attenuate and treat runoff. Best Practice during construction will be rigorously followed during construction to minimise the risk of pollution and contamination.

13.5.3. Consideration will be given in the design in order that the potential impacts to the water environment are minimised. These include taking into account the structures and the foundations required to reduce the need for deep piles into the aquifer. Soakaways will potentially be considered for slope drainage to minimise the amount of water being discharged.

## 13.6. Assumptions and Limitations

13.6.1. The principal assumptions and limitations for this assessment are as follows:

- The water quality within the surface water features has not been measured, the sensitivity of these features having been classified from available predominately qualitative information;
- No new topographic survey of watercourses has been assumed as necessary at this stage depending on the available data;
- Baseline conditions have been established in part from historical data, and conditions are expected to change before or during the construction and operation of the Scheme;
- The detailed design of the surface water drainage system is not within the scope of this assessment and this design will be carried out at a later stage;
- Detailed design of dewatering works for below ground structures is not within the scope of this assessment and this design will be carried out at a later stage; and

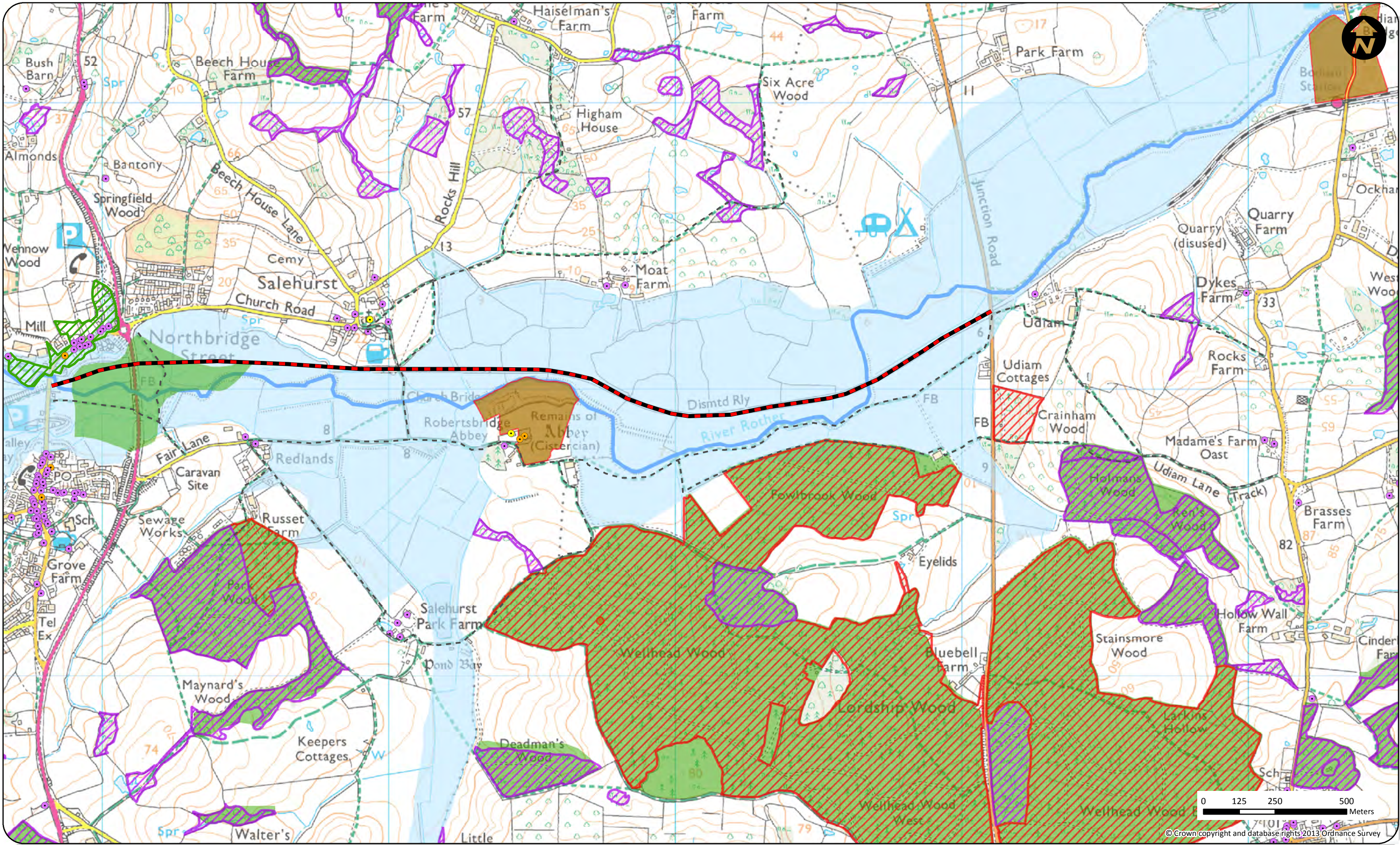


- Sustainable drainage techniques shall be fully considered and incorporated as far as is practicable to reduce the impact of the scheme on the surrounding environment. The Environment Agency SUDS Hierarchy will be used as a guide to assess which options are feasible specific to each case. Where there is potential for contaminated or polluted runoff, sustainable drainage systems (SUDS) can be incorporated to provide treatment to deal with these issues.



## **APPENDIX 1**

### **Figures**

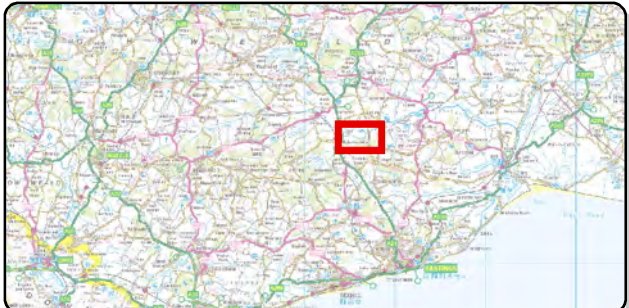


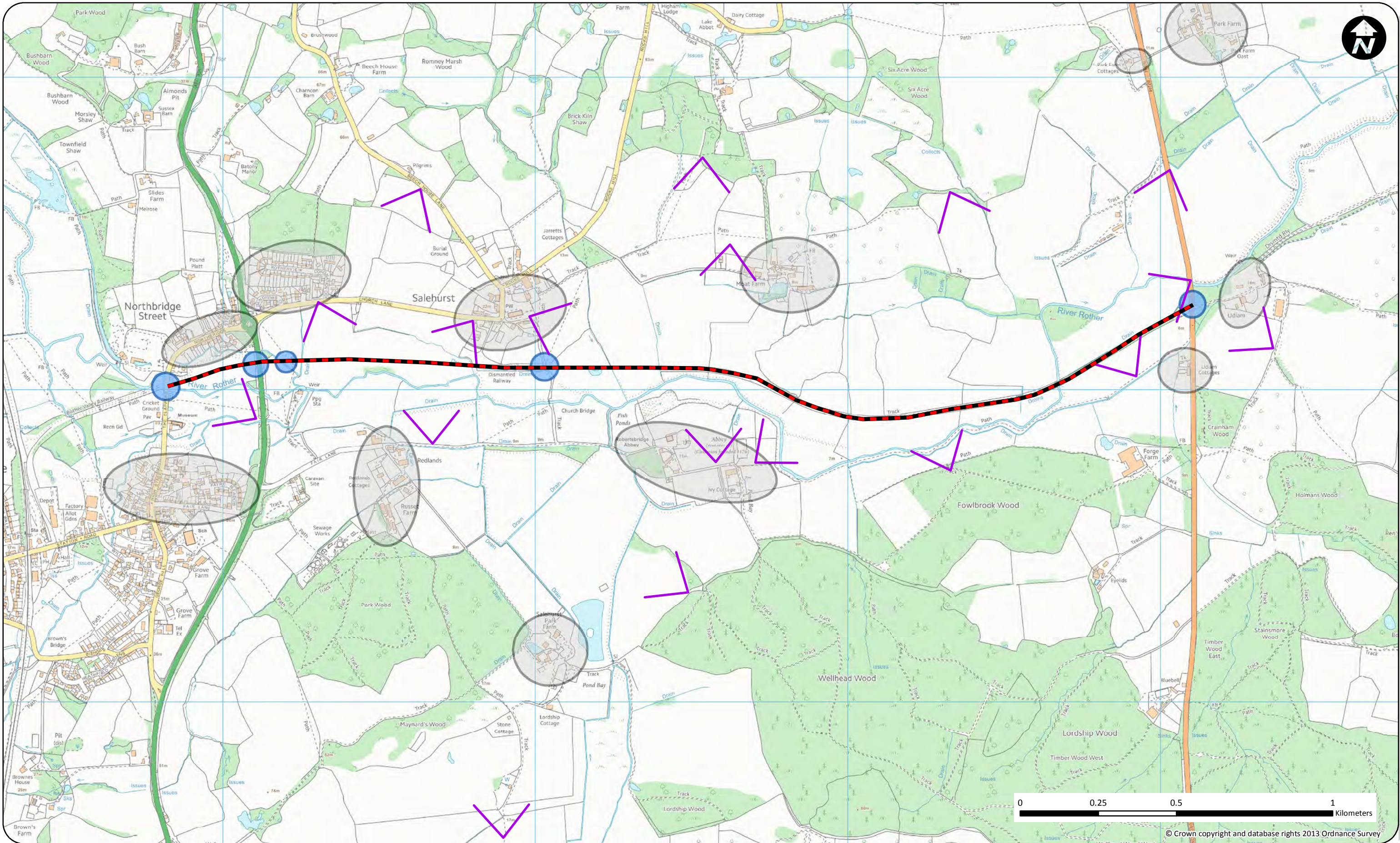
Project: Rother Valley Railway EIA  
Client: Rother Valley Railway  
Drawing Title:  
**Scoping and Methodology**  
**Environmental Constraints Overview**

**Legend**

- |                         |                     |                                 |            |
|-------------------------|---------------------|---------------------------------|------------|
| Proposed Railway        | Scheduled Monument  | Ancient & Semi-Natural Woodland | River      |
| <b>Listed Buildings</b> | Conservation Area   | Ancient Replanted Woodland      | Floodplain |
| Grade I                 | Public Right of Way | BAP Habitat                     |            |
| Grade II*               |                     |                                 |            |
| Grade II                |                     |                                 |            |

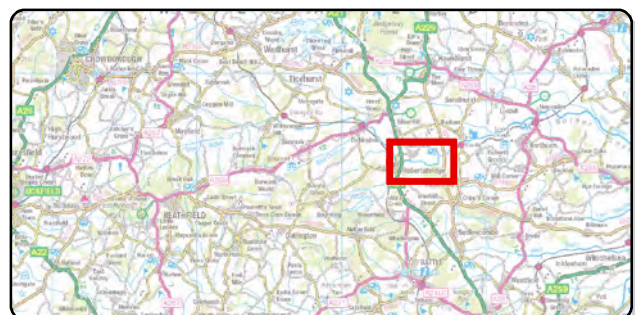
Temple Group Ltd., Tempus Wharf, 33A Bermondsey Wall West, London SE16 4TQ  
Tel. 020 7394 3700 Fax. 020 7394 7871





Project: Rother Valley Railway EIA  
Client: Rother Valley Railway  
Drawing Title:  
**Landscape and Visual Assessment  
Overview Map**

- Legend**
- Proposed Railway
  - Potential Locations for Representative Viewpoints
  - Crossing Points to Roads and Public Rights of Way
  - Groups Of Residential Properties to be Assessed





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*...intelligent strategy, responsible delivery*

## **2) Scoping Opinion (Rother District Council)**

## IMPORTANT DOCUMENT

### THE TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) (ENGLAND AND WALES) REGULATIONS 2011

### NOTICE UNDER THE REGULATIONS OF A SCOPING OPINION

In exercise of my delegated authority on behalf of Rother District Council I hereby advise you that it has adopted the following scoping opinion:

**Proposed Development:** Rother Valley Railway – re-instatement of approximately 3.4km length of the former Kent and East Sussex Railway track (including: bridges and road crossings, a halt and track infrastructure).

**Location:** Land between Northbridge Street, Robertsbridge (Robertsbridge and Salehurst Parish) and Junction Road (Ewhurst Parish)

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### **Opinion:**

#### *Summary*

Rother District Council has consulted on the Scoping Opinion Request letter from Mr D Gillett and Mr D Slack on behalf of the Rother Valley Railway, dated 29 October 2013 and the Scope and Methodology Report prepared by the Temple Group, the responses received have been taken into account in this opinion.

Rother District Council is satisfied that the topic areas set out in the letter dated 29 October 2013 encompass those matters identified in Schedule 4, Part 1, Paragraph 3 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (as amended).

Overall the proposed methodology and scope of the report is detailed and well considered. The principal issues in the determination of an application are likely to be those subject areas covered by the road crossings and the flood plain issues. The Scoping Report recognises that the applicant has been working closely with the relevant agencies, and will continue to do so. The comments and feedback we have

received from the various agencies are contained in the Appendix to this letter. The ES should have regard to the comments received.

Rother District Council draws attention to the text below, which forms part of the opinion and is made in response to the request letter dated 29 October 2013. The opinion draws attention to general points as well as each of the specialist topic areas.

#### *Consultation*

A full list of the consultation bodies and those who replied and whose comments have been taken into account in the preparation of this Opinion is provided at Appendix 1 together with their comments.

The Environment Statement (ES) should demonstrate that it has considered the points raised by the consultation bodies.

#### *Proposed Development*

The rationale for the proposed development is set out in Policy EM8 of the Rother District Local Plan (2006).

The proposed development is described in the letter dated 29 October 2013. From this, Rother District Council has written a Description of Proposed Development, set out above. A plan showing the route of the railway in red has been provided in the Appendices to the Scoping Report (drawing number: T2073-RV-TGP-SUS-1) and the Opinion is based on this information. The planning application will require a plan showing the planning application boundary and this should include all the operational land comprising the proposed development.

Any proposed works required as associated development, or as an ancillary matter (whether on or off-site) should be considered as part of an integrated approach to environmental assessment.

The ES should include a clear description of all aspects of the proposed development, at the construction and operational stages, based on information reasonably available at that time.

#### *Construction*

Information on construction, that is reasonably available at that time, should be provided. This should refer to: phasing of construction; construction materials; methods and activities associated with each phase; siting of construction compounds (on and off-site); lighting requirements; and the number, movements and parking of construction vehicles (HGVs and staff).

#### *Cumulative Effects*

The local planning authority has recently received a planning application (RR/2013/2380/P) on land to the north of Station Road, Robertsbridge, adjacent to the commercial premises – Culverwells, the railway station, and the recently laid railway track. The proposed development is the erection of commercial (B1) business units (1300 sq. m) and 17 dwellings. This application relates to an allocated site in the Rother District Local Plan (2006). Other than this, the local planning

authority is not aware of any committed or consented projects it believes are likely to require consideration within the ES as a result of likely significant inter-project environmental effects.

#### *Characteristics of Potential Impacts*

The Opinion request letter dated 29 October 2013 and Scoping and Methodology Report sets out the anticipated environmental effects expected to occur both during construction and operation. It is noted that in addition to the ES a Draft Construction Environmental Management Plan (CEMP) will also be submitted to capture the mitigation identified in the ES and form a management structure to ensure their implementation during the construction and where necessary for a period post-construction. Rother District Council recognises that the level of information provided at an early stage is not always sufficient to allow for detailed comments from either the Council or statutory consultees. We are aware that the applicant has already consulted a number of the bodies and that this process is on-going. We also note that the CEMP is described as a draft as it is a working document that would be adopted and updated as necessary by the contractor for the purposes of the construction phase.

#### *Air Quality:*

It is noted that the assessment will take account of the air emissions from the proposed development and emissions related to activity associated with the proposed operation of the development – post construction. It is also noted that this will take into account any impacts on dwellings. With regard to the operation of the development this should include any dwellings in the vicinity of the newly laid section of line between Northbridge Street and Robertsbridge Station which presently is not used by rail traffic. The Council's Environmental Health Service will be consulted on the submitted planning application.

#### *Archaeology and cultural heritage:*

The applicant's attention is drawn to the advice of the County Archaeologist's consultation response, dated 3 December 2013. The County Archaeologist has commented with regard to Section 5.6.1 of the Scoping Report where it is noted/assumed that, 'all archaeological assets within the footprint of the original railway were destroyed during its construction – and possibly over a slightly wider area. The County Archaeologist recommends that it should be considered possible that deposits with archaeological interest immediately below the make up for the historic railway line may remain in situ. The potential for this should be assessed and considered, including during the evaluation of impacts.

#### *Socio-economic:*

The scope and methodology that will be used for the assessment of potential socio-economic impacts arising from the proposed scheme are noted. Principally, the scheme will have direct and indirect effects on the local economy and as part of this, anticipated benefits to the rural economy through tourism have been identified. This needs to be balanced against the wider potential economic impact on the southern coastal area (including Hastings and Bexhill) as a result of the effects on the free-flow of traffic resulting from the proposed crossings on the main north-south route (A21 trunk road) and the B2244. This issue has previously been raised by the

Highways Agency and ESCC Highway Authority and may over-lap with the transport chapter of the ES.

*Ecology and nature conservation:*

We have not consulted with Natural England on the scoping report as there are no identified protected habitat sites within the vicinity of the development. The proposed methodology contained in the report appears to be satisfactory and the scope and detail is wide ranging. It is noted that where potential impacts are predicted on species beyond the scope of Phase 1 habitat surveys an initial evaluation of significance will be provided with recommendations for further surveys prior to construction if these are considered necessary to verify the presence of species and so determine licensing or mitigation requirements.

*Land Quality:*

It is noted your technical team has carried out pre-application consultations directly with the Council's shared Environmental Health Service and information has been provided on the technical information that would need to be provided with the planning application and this has been agreed. We will consult formally with the Environmental Health Service upon the planning application being received and validated. We would concur with the view expressed that land quality matters can be satisfactorily dealt with via a "standard", non-EIA, development management procedure in which any planning consent would be subject to conditions.

*Land use and agriculture:*

The post-development impacts of agricultural land being severed and possible loss of access are seen to be particularly significant within this topic area. It is noted that you will undertake consultations with owners and occupiers of agricultural land where possible to seek their views on how to best offset or reduce the physical disturbance to these holdings. The findings from this should form part of the supporting information with the application together with any proposed mitigation measures to address any identified impacts.

*Landscape and visual impacts:*

The undertaking of a detailed landscape and visual assessment using current guidelines is welcomed and the approach set out in the Scoping Report is agreed. Additionally, whilst it is understood that much of the re-laid track will be on the existing track bed, the information with the application should provide details of any new track bed that is required including any raised or banked areas. This may be particularly necessary where the levels of the surrounding land need to be increased to meet the levels of the highway for the road crossings. It is considered that existing and proposed ground levels will be of particular significance in the consideration of any planning application not only in terms of 'Landscape and visual impacts' but this may also have implications regarding the flood assessment issues and also the severance of agricultural land.

The landscape and visual impacts should also take account of any external lighting that may be proposed. If this is a requirement I am mindful that it may particularly apply to the road crossings. Details of this should be provided together with the appropriate assessment of impacts.

#### *Noise and vibration:*

Again it is noted that the proposed methodology for assessment has been discussed with the Council's shared Environmental Health Service. We will consult with the Environmental Health Service on the application.

#### *Transport and access:*

The need for rail crossings is likely to be a principal issue in the determination of the application. As stated in the scoping Report this will involve the Highway Agency in respect of the A21 trunk road and also East Sussex County Council as the highway authority responsible for other classified roads. Both authorities have been consulted on the Scoping Report and received comments are contained the Appendix to this letter.

The Highway Agency has recognised the proposed introduction of a level crossing on the A21 as a principal potential impact on the grounds that this will introduce both delay and road safety implications associated with queuing traffic and implications for the efficient operation of the Strategic Road Network (SRN), which they manage. With respect to the information required with the ES, the Highway Agency requests that the baseline information is based on both the 2011 and 2012 studies as well as other documents detailed within section 12.2 of the report. Additionally, further to the Mott Macdonald studies. The Highway Agency recommends that the latest TRADS data for the A21 is amalgamated within the ES to help inform the baseline and provide the most up to date picture for the Strategic Road Network. Please see the Appendix for the full text of the Highways Agency's comments and requirements.

The consultation response from the Highway Authority (East Sussex County Council) supports those made by the Highways Agency. These also point out that one of the County Council's Local Transport Plan 3 key objectives is to ensure, where possible, journey time reliability. In this regard it is recognised that the introduction of level crossings – particularly on the B2244 - could introduce significant delays and have a significant negative impact on journey time reliability. These impacts will need to be quantified and assessed.

In terms of the proposed level crossings on the B2244 and Northbridge Street, a stage 1 and 2 combined Road Safety Audit should be submitted with the Transport Assessment. The applicant should also contact the ESCC Road Safety Team to discuss what complementary road safety measures could be introduced. Please see the Appendix for the full text of the Highways Authority's comments and requirements.

Both the Highways Agency and the Highway Authority will be formally consulted on the application.

#### *Water quality, hydrology and hydrogeology:*

The Environment Agency has been consulted on the Scoping Report and comments received are contained within the Appendix. The main topics of: flood risk, contamination, and surface water drainage are covered in the consultation response. The Scoping Report identifies that the proposed route of the track necessitates crossing the floodplain of the River Rother (Flood Zone 3). A principal issue in the consideration of the application will be the need to ensure that the any development in the floodplain is safe for future occupants and does not increase flood risk elsewhere. It is noted that a Flood Risk Assessment (FRA)

will be produced in accordance with the requirements of *NPPF: National Planning Policy Framework* and the *NPPF Technical Guidance* and this will be submitted with the application. It is noted that the applicant has been working with the Environment Agency in developing the FRA and the details of this are yet to be finalised.

Signed .....  ..... Dated..... *17 January 2014* .....

## APPENDIX 1

### List of Consultation Bodies

*East Sussex County Council – Archaeology [comments received 3.12.13]*

*Highways Agency – road transport: trunk roads [comments received 2.12.13]*

*East Sussex County Council – Transport Development Control [comments received 7.1.14]*

*Environment Agency [comments received 25.11.14]*



**Jane Balshaw**

**From:** Casper Johnson <Casper.Johnson@eastsussex.gov.uk>  
**Sent:** 03 December 2013 16:16  
**To:** Trish Trigg; Planning E-mail Address  
**Cc:** County Archaeology  
**Subject:** FW: PE/00738/2013 - Consultation on Environmental Impact Assessment Scoping Report for the proposed Rother Valley Railway.

**Importance:** High

**FW: PE/00738/2013 - Consultation on Environmental Impact Assessment Scoping Report for the proposed Rother Valley Railway.**

**Archaeology: Scoping Opinion from ESCC**

FAO Trish Trigg,

Thank you for consulting us on the above EIA Scoping Report and seeking our opinion.

With regard to Archaeology & Cultural Heritage; the proposed methodology is indeed considered to be satisfactory. Chapter 5 of the report is clearly laid out and well written. The approach to the study area, the baseline, consideration of significance, potential and evaluation of impacts is appropriate.

The only comment I would have would be with regard to Section 5.6.1 where it is noted/assumed that 'All archaeological assets within the footprint of the original railway were destroyed during its construction – and possibly over a slightly wider area.'

At this stage I would recommend that it should be considered possible that deposits with archaeological interest immediately below the make up for the historic railway line may remain in situ. The potential for this should be assessed and considered, including during the evaluation of impacts.

I hope that this is helpful.

kind regards

Casper

*Casper Johnson BA (Hons) MIFA FRSA FSA*

*County Archaeologist*

*East Sussex County Council*

ROTHER DISTRICT COUNCIL	
PLANNING DEPT.	
REC'D	3 DEC 2013
REFERRED TO: <i>HC</i>	
REPLY REQUIRED:	
ACK CARD DATE SENT:	

Our ref HA/4/KJ/3068

Rother District Council  
Planning Division  
Town Hall  
Bexhill on Sea  
East Sussex  
TN39 3JX

ROTHER DISTRICT COUNCIL	
PLANNING DEPT.	
REC'D	2 DEC 2013
REFERRED TO:	
REPLY REQUIRED:	
ACK CARD DATE SENT:	

Keith Jacobs  
1B  
Federated House  
London Road  
Dorking RH4 1SZ

Direct Line: 01306 878219

Fax: 01306 878147

29 November 2013

Dear Trish,

## ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT FOR THE PROPOSED ROTHER VALLEY RAILWAY

Thank you for inviting the Highways Agency (HA) to comment on the Environmental Impact Assessment (EIA) scoping report for the proposed Rother Valley Railway reinstatement between Northbridge Street and Junction Road.

As you are aware, the proposals include the creation of a new level crossing on the A21 east of Robertsbridge which has the potential to affect the safe and efficient operation of the Strategic Road Network (SRN) which we manage. We are currently in discussion with Rother Valley Railway and their appointed transport consultants Mott Macdonald with respect to the transport impact that the level crossing proposals could introduce.

The transport chapter of the EIA is likely to be influenced by the outcome of our ongoing discussions and as such our comments below include a summary of the discussions to date but are subject to change.

### Transport and Access Baseline

The scope indicates that the baseline conditions for the EIA will in part be based on the 2011 Mott Macdonald Traffic Impact Study. We raised several queries with the 2011 study and requested that supplementary information was provided. This was submitted as part of a technical note dated January 2012. We therefore request that the baseline information is based on both the 2011 and 2012 studies as well as the other documents detailed within section 12.2.

Further to the Mott Macdonald studies, we recommend that the latest TRADS data for the A21 is interrogated within the EIA to help inform the baseline and provide the most up to date picture for the SRN.

### Potential Impacts

The potential impacts have been separated into construction and operational impacts. This approach is welcomed and should enable the short and long term impacts to be reviewed independently within the EIA.

The construction traffic impact on the A21 will need to include an assessment of HGV size, routing and frequency. We recommend that discussions take place with the HA prior to the evaluation taking place to ensure that the routing assumptions in particular are suitably robust.

With respect to the operational impacts, paragraphs 12.2.9 and 12.3.3 state that the impacts associated with the level crossings are being considered within the work undertaken by Mott Macdonald and therefore are separate from the EIA. Whilst this approach to the EIA methodology is acceptable it should be noted that discussions are still ongoing and for completeness we recommend that a summary of the impacts is included within the final EIA.

I have provided below a summary of the issues we have been discussing with Mott Macdonald and Rother Valley Railway. As noted above, these are ongoing and therefore subject to change.

- The introduction of the level crossing will introduce both delay and road safety implications associated with queuing traffic. On high flow days queues will reach the Northbridge Street roundabout.
- Network Rail has closed in excess of 600 level crossings since 2009 on safety grounds. The HA's reputation is therefore at risk by consenting to a new level crossing which will have negative implications for the A21 which cannot be fully mitigated.
- We are in the process of reviewing a number of documents that have recently been received including maintenance and emergency procedures associated with the level crossing.

### Evaluation of Impacts

The list of construction impacts detailed in 12.4.2 is acceptable but as noted above we recommend that discussions are held with the HA in advance of the evaluation taking place.

I hope that the above has been helpful please let me know if you have any queries.

Yours sincerely



**Keith Jacobs**

NDD Asset Development Team - Sussex

Email: Keith.Jacobs@highways.gsi.gov.uk

## Mark Cathcart

---

**From:** Chris Stanyard <Chris.Stanyard@eastsussex.gov.uk>  
**Sent:** 07 January 2014 11:49  
**To:** Mark Cathcart  
**Cc:** Richard Wilson  
**Subject:** RE: Rother Valley Railway.

Mark,

Sincere apologies for the delay.

As mentioned by the Highways Agency a Transport Assessment will need to be submitted as part of any application and details of proposed operating times and frequency will be crucial. This Highway Authority supports those comments made by the Highways Agency, dated 29 November 2013.

While we are not responsible for the Trunk network, clearly any significant delay will have an impact on other parts of the network, which are under our responsibility. These impacts will need to be quantified and assessed at the application stage. The applicant should also be aware that one of the County Council's Local Transport Plan 3 key objectives are to ensure, where possible, journey time reliability. Clearly the introduction of an at grade level crossing on a strategic part of the network will have a negative impact on journey time reliability.

In terms of the proposed level crossings on the B2244 and Northbridge Street, a stage 1 and 2 combined Road Safety Audit should be submitted with the Transport Assessment. The applicant should also contact the East Sussex County Council Road Safety Team to discuss what complimentary Road Safety measures could be introduced - particularly on the B2244.

Regards,

**Chris Stanyard**  
Transport Development Control  
Communities, Economy & Transport Department  
East Sussex County Council  
☎ 01273 482285  
✉ [chris.stanyard@eastsussex.gov.uk](mailto:chris.stanyard@eastsussex.gov.uk)

Ms Trish Trigg  
Rother District Council  
Town Hall London Road  
Bexhill-on-Sea  
East Sussex  
TN39 3JX

**Our ref:** KT/2013/117402/01-L01  
**Your ref:** PE/00738/2013  
**Date:** 25 November 2013

Dear Ms Trigg

**CONSULTATION ON ENVIRONMENTAL IMPACT ASSESSMENT SCOPING  
REPORT FOR THE PROPOSED ROTHER VALLEY RAILWAY BETWEEN  
NORTHBRIDGE STREET, ROBERTSBRIDGE & JUNCTION ROAD, UDIAM FARM,  
EWHURST.**

Thank you for requesting our scoping opinion. Please accept our apologies for the delayed response. We ask that the following comments are noted:

**Flood risk**

We understand from the Scope and Methodology Report that a Flood Risk Assessment (FRA) will be undertaken to support the planning application.

The developer has been working with the Agency in developing the FRA, the details of which are yet to be finalised. The developer is aware of the need to ensure the proposed railway will not increase flood risk or effect the ability of the Agency to operate and maintain flood defences in Robertsbridge.

**Contamination**

Any pathways for contamination must be strictly controlled to avoid pollution of principal and secondary aquifers from any historic contamination identified on the site from previous uses.

At this stage we do not provide detailed site-specific advice or comments with regard to land contamination issues apart from identifying the site sensitivity as above. Whilst we will not be providing specific advice at this stage in the planning process, it is recommended that the requirements of the National Planning Policy Framework (NPPF) are followed. Paragraph 109 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels water pollution. Therefore, in

completing any site investigations and risk assessments the applicant should assess the risk to groundwater and surface waters from contamination which may be present and where necessary carry out appropriate remediation.

In making our response we have considered issues relating to controlled waters. The evaluation of any risks to human health arising from the site should be discussed with the Environmental Health Department.

We recommend that the applicant:

- Applies the risk-based framework set out in the Model Procedures for the Management of Land Contamination (CLR 11) and follow the guidance in that document so that the best decision are made for the site,
- Refers to the Environment Agency guidance on requirements for land contamination reports,
- Uses BS 10175 2001, Investigation of potentially contaminated sites – Code of Practice as a guide to undertaking the desk study and site investigation scheme,
- Uses MCERTS accredited methods for testing contaminated soils at the site, and
- Consult our website at [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) for further information about any permissions that may be required.

### **Foul Drainage**

If required, options for foul drainage should be considered at an early stage in the planning process.

### **Surface Water Drainage**

Please consult us at an early stage on any surface water drainage proposed to infiltrate to ground.

If you have any further questions please do not hesitate to contact me

Yours sincerely

**Mr Pieter De Villiers**  
**Planning Advisor**

Direct dial 01732 223246

Direct fax 01732 223289

Direct e-mail [pieter.devilliers@environment-agency.gov.uk](mailto:pieter.devilliers@environment-agency.gov.uk)

### **3) Ecology Phase 1 Habitat Survey (CLM)**

# **Ecological Appraisal**

## **Rother Valley Railway**

### **(Track Reinstatement between Northbridge Street and Junction Rd)**

Oct 2013

Prepared by	Assessed by
Alex Macdonald	Kevin Jay



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## CONTENTS

Introduction	I
Methodology	3
Results	4
Evaluation and Recommendations	10
Summary	13
References	14
Appendices	
Appendix 1 Map of habitats on site	15
Appendix 2 Map of accessible areas of the site	16
Appendix 3 Target Notes	17
Appendix 4 Photos	18
Appendix 5 Ponds within 500m of the site	22
Appendix 6 Summary of protected species legislation	23
Appendix 7 SxBRC Report	29

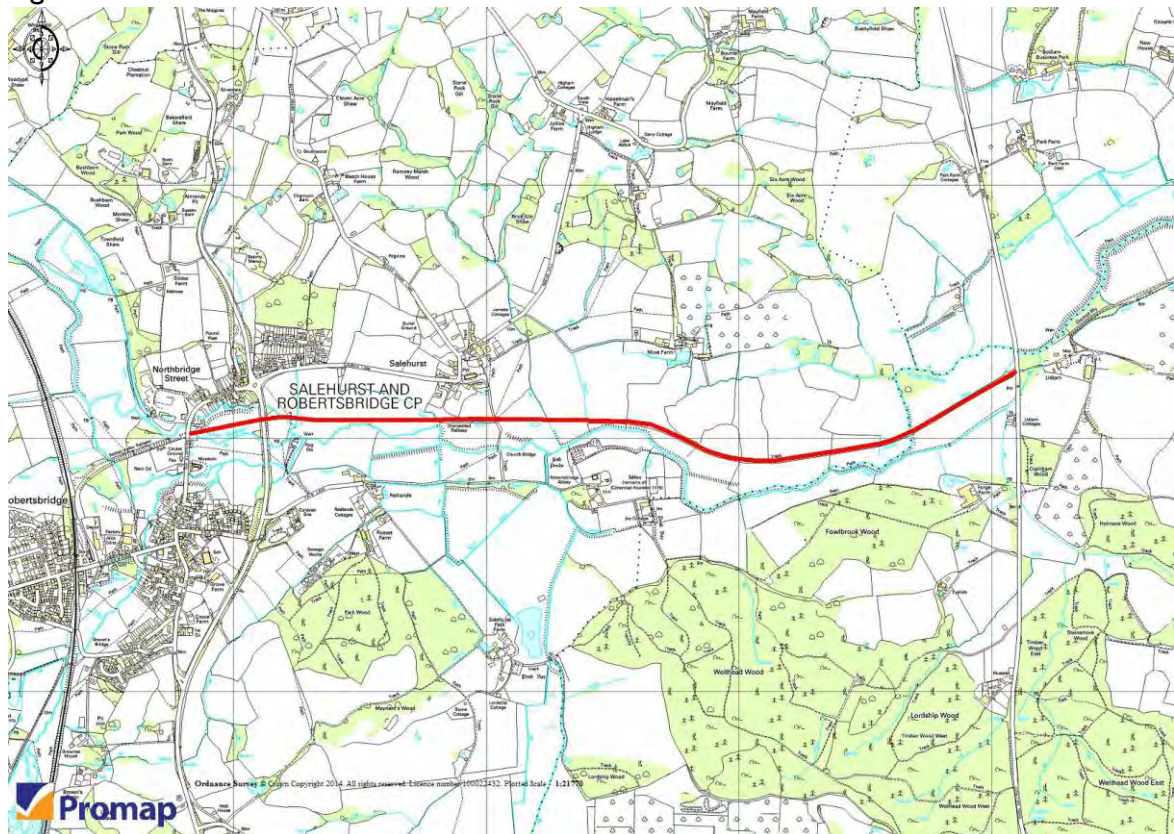


## INTRODUCTION

In order to help assess the future development potential and constraints of the course of the currently derelict railway line between Junction Road and Northbridge Street, Robertsbridge (hereinafter referred to as “the site”), Complete Land Management LLP (CLM) undertook an ecological appraisal of the site and its immediate surroundings. Despite concerted efforts by the Rother Valley Railway to gain permission to access all areas of the proposed link it has only been possible to visit one area fully (managed by Mr Wilton) whilst the remainder has had to be viewed from either Public Rights of Way or roads. Appendix 2 shows the areas accessed during this appraisal.

The proposed route runs east to west from approximately TQ 741 240 to TQ 771 242, near Robertsbridge in East Sussex alongside and to the north of the River Rother, through farmland owned by three separate landowners (see the red line in Figure 1). The majority of the dismantled railway creates a visible feature within the landscape where track bed has been succeeded by woodland or has left crop marks in the fields and it is clearly marked on the OS Map for the area. The purpose of this survey is to provide a preliminary ecological appraisal to guide the compliance of future development with legislation.

Figure 1 - Illustration of the location of the site.



The key objectives are as follows:

- Identify all relevant statutory and non-statutory designated sites and features of ecological significance within the site and its surroundings.
- Broadly describe the habitats on site.
- Assess the potential of the site to support protected species.
- Recommend further survey work that may be necessary.



## METHODOLOGY

The site was visited on 19th of July 2013 by Alexander Macdonald MCIEEM of CLM. The site survey commenced at 9.30 am on a sunny day with approximately 10% cloud cover and in temperatures of around 24 degrees centigrade.

The terrestrial and riparian habitats on the development site were scoped for their potential to support protected species. A desk based search to find any ponds within the 500 metre footprint area was undertaken, using the 1:25,000 Ordnance Survey map of the area.

A search of historical records recorded on site and within the surrounding area was undertaken. A desk based search for historical records of flora and fauna in the form of a report from the Sussex Biodiversity Records Centre was completed. In order to identify designated sites and high conservation value habitats in the area the following internet sites were visited:

- MAGIC
- National Biodiversity Network
- Rother District Council planning portal
- Modern and old aerial photography
- Local wildlife groups

Dominant habitat types were mapped following the desk study and field visit.

### Limitations to survey

Habitat mapping is constrained by the reliance on aerial photography and OS maps where areas of the site are inaccessible. As far as possible the Phase I habitat survey methodology recommended by Natural England (Nature Conservancy Council, 1990) was followed. Dominant plant species were noted, as were species indicative of particular habitat types, however there was no attempt to compile exhaustive species lists.



## RESULTS

The Site lies within the Natural Area 'The High Weald' (Natural England) and the High Weald Area of Outstanding Natural Beauty (AONB). The AONB highlights the characteristic habitat and wildlife of the area including wet woodland valleys, rolling hills, sunken lanes and scattered farmsteads.

The report by SxBRC includes maps showing statutory and non-statutory designated sites and the main habitats and natural features of the area (see Appendix 7). There are no statutory sites but two locally designated areas fall within the search area, to the north of the site:

**SNCI CR20 – South Park Pony Stud Meadows** – a series of Biodiversity Action Plan (BAP) habitat species rich lowland meadows with a number of ponds and two shaws containing species indicative of ancient woodland. 1.5 km to the north.

**SNCI CR59 – Silverhill & Trough Wood** – 21 ha of ghyll woodland supporting ancient woodland indicators and straddling a south-west north-east running stream with a steep, species rich gully. 1.8 km to the north.

The SxBRC habitat map shows:

- Floodplain grazing marsh
- Wet woodland
- Several small ghyll woodlands that follow the lines of streams in the area
- Numerous ponds, particularly to the north of the site
- Areas of ancient woodland, particularly a large area in the south
- Areas of floodplain grassland by the River Rother and its tributaries further upstream and directly over the western end of the site
- Several ancient trees, on the outskirts of the search area and a few black poplar *Populus nigra* just south of Robertsbridge

### Phase I Habitat Survey

The results of the phase I habitat survey are presented in Appendix I. Mapping conventions and codes follow those described by the Joint Nature Conservation Committee (JNCC, 1993). Habitats recorded include:

- |                                     |         |
|-------------------------------------|---------|
| • Broadleaved semi natural woodland | A 1.1.1 |
| • Woodland mixed semi natural       | A 1.3.1 |
| • Dense/continuous scrub            | A 2.1   |
| • Scattered scrub                   | A 2.2   |
| • Broadleaved scattered trees       | A3.1    |
| • Neutral semi-improved grassland   | B2.2    |
| • Improved grassland                | B4      |
| • Standing water                    | G1      |



- |    |                                  |        |
|----|----------------------------------|--------|
| •  | Running water                    | G2     |
| •  | Arable cultivations              | J1.1   |
| •  | Species-rich intact hedgerow     | J2.1.1 |
| •• | Species-rich hedgerow with trees | J2.3.1 |

The main characteristics of the site are described in the following sections, with sites or features of particular conservation value detailed as appropriate, (see Appendix 3 for target notes).

### Woodland

A significant length of the dismantled railway is under the cover of broadleaved woodland which appeared to be dominated by ash *Fraxinus excelsior* and oak *Quercus* spp with an understory of hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, field maple *Acer campestre*, ivy *Hedera helix*, dog rose *Rosa canina* and bramble *Rubus fruticosus*. These species were noted where public rights of way cross the track (see Appendix 2) and the oak and ash could be seen from a distance to be dominating the stretch where the site was visible from the adjacent footpath.

### Scrub

The far eastern, and accessible, section of the line was more like dense scrub in nature than woodland and typically consisted of hawthorn, birch (*Betula* spp), dogwood *Cornus sanguinea*, ash, blackthorn *Prunus Spinosa*, oak, willow (*Salix* spp) and spindle *Euonymus europaeus* (TN1).

### Hedgerows

A network of species-rich hedgerows and hedgerows with trees (typically containing a mix of oak, field maple, holly *Ilex aquifolium*, spindle, hazel, hawthorn, blackthorn and ash) connect the site with neighbouring areas of ancient woodland mentioned in the desk study.

### Ancient trees

Mature/ancient in-field oak trees and fallen oaks were noted in grassland adjacent to the footpath (TN3). Several mature and ancient trees were also recorded along the riverside with plenty of standing and fallen deadwood showing signs of being used by woodpecker and invertebrates.

### Wetland

At the western end of the site is an area designated as BAP priority habitat – Floodplain grazing marsh (TN6) with a small network of ditches and seasonally flooded grassland.

### Ditches and watercourses

The River Rother meanders along the south of the site and is largely under the cover of woodland and/or bankside vegetation at the eastern end of the site (TN4). Species noted include willow, alder *Alnus glutinosa*, oak, blackthorn, hawthorn, hornbeam *Carpinus betulus*, dogrose, ivy, meadowsweet *Filipendula ulmaria*, hogweed *Heracleum*



*sphondylium*, nettles *Urtica dioica*, creeping thistles *Cirsium arvense*, creeping buttercup *Ranunculus repens*, herb robert *Geranium robertianum*, hemp agrimony *Eupatorium cannabinum*, purple loosestrife *Lythrum salicaria*, hemlock water dropwort *Oenanthe crocata* and pendulous sedge *Carex pendula*. Anthills and rabbit *Oryctolagus cuniculus* droppings were noted along the riverside. There are several ditches (TN5) that drain into the river from the site and bordering farmland.

### **Ponds**

Where the original track bed is no longer under the cover of woodland, and is only evident by the crop marks on the arable land, a pond lies directly in the path of the proposed reinstatement (TN8). Two further ponds are shown on the line of the proposed route. Adjacent to the site are fish ponds (TN9) associated with a 12th Century Abbey. These are marked on the OS Map but could not be seen during the survey.

### **Grassland**

The neighbouring grassland to the site is mainly species poor improved grassland, grazed by cattle or horses and/or cut for hay/silage. In fields adjacent to the stream some areas of semi-improved grassland lie quite wet and rushy, or appear tussocky. A single plant of a small water dropwort species *Oenanthe spp* was noted beside the path in a semi improved field to the south of Salehurst (TN10). All the grassland fields noted had either been recently cut or were grazed relatively tight at the time of the survey.

### **Arable**

Due to the relatively intense nature of the cropping this land is considered to be of low ecological value. However, some of this land does contain semi-improved grass field margins. The botanical diversity of these margins is low.

### **Buildings**

Many of the buildings noted in the surrounding area are traditional farm buildings, mainly converted into dwellings. There is a church and several old buildings made from local stone in the nearby village of Salehurst and the remains of a 12th Century Abbey and stone or metal bridges and weirs along the river (TN11).

### **Locally recorded protected species**

The site as a whole offers potential habitat for legally protected species; including invertebrates, bats, reptiles, amphibians, badger *Meles meles*, otter *Lutra lutra* and water vole *Arvicola terrestris*.

### **Invertebrates**

The matrix of running and standing water along with the scrub, grassland, bare ground, old rail embankment and woodland habitats which contain a deadwood component indicate that the site is likely to support a good range of invertebrate species. The biological records search (see Appendix 7) did not reveal any recent



records of any protected or BAP invertebrates. The likelihood of invertebrates using the site is high.

### **Amphibians**

The ponds and slow moving ditches have potential for breeding amphibians including Great crested newt, which have recently been recorded in the local area. One of the ponds is surrounded by cultivated arable land which it is considered reduces the opportunities for commuting habitat and for meta-populations to form (TN8), unlike the other pond (TN9) which lies next to grassland and scrub. Any marshy areas, dry ditches, areas of woodland, grazing pasture and scrubby vegetation nearby or on site represent suitable foraging habitat for great crested newts. Records for the 2km search area within the past 20 years include four records of great crested newt *Triturus cristatus*. The likelihood Great crested newt to be using the site is high.

### **Reptiles**

The matrix of running and standing water along with the scrub, grassland, bare ground, old rail embankment and woodland habitats which contain a deadwood component indicate that the site offers good habitat for the reptiles recorded nearby including slow-worms, common lizards and grass snakes, particularly in areas of rough grassland and scrub. The SXBRC report has a number of records within the last twenty years including two of slow-worm *Anguis fragilis*, two of common lizard *Zootoca vivipara* and three of grass snake *Natrix natrix*. A further record for Viviparous lizard was found looking through ecological surveys on the Rother District Council planning portal. The likelihood of at least one of these species to be using the proposed route is high.

### **Birds**

The report by SxBRC (see Appendix 7) records that the site and its surroundings support reasonable numbers of breeding, overwintering and summer visitor birds typical of grazing marsh, farmland, garden and woodland habitats. The woodland and scrub areas, on site provide good opportunities for nesting birds and the potential for them to be using these habitats is high. The farmland is suitable for ground nesting birds such as lapwing *Vanellus vanellus* and skylark *Alauda arvensis*, which are recorded within the local area.

### **Bats**

The river corridor and the linear woodland along part of the old trackbed are likely to act as commuting and foraging routes for bats and the surrounding ponds and areas of rough vegetation are likely to provide good foraging habitat. Given the potential roosting sites in the surrounding areas (the ancient and mature trees and the old buildings and structures), the potential for bats to be using the site is high. The tunnel under the A21 may also provide potential roosting sites.

Within the 2 km search area, the data search gives several results for Chiroptera spp (bats) as summarised in Figure 2. See Appendix 7 for a detailed



list of records. A search for the same area on the National Biodiversity Network website found no additional species records.

Figure 2 – Summary of bat records within 2km of the site

Common Name	Latin Name	Number of records	Type of record
Bat sp	<i>Chiroptera</i>	16	UR, D
Brown Long-eared bat	<i>Plecotus auritus</i>	25	H, MR, UR, D
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	3	UR, D
Daubenton's bat	<i>Myotis daubentonii</i>	31	H, MR, UR, D
Long-eared sp	<i>Plecotus</i>	15	UR, D
Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>	1	
Natterer's bat	<i>Myotis nattereri</i>	39	MR, UR
Noctule bat	<i>Nyctalus noctula</i>	1	
Pipistrelle sp	<i>Pipistrellus sp</i>	19	UR, D
Serotine	<i>Eptesicus serotinus</i>	5	UR, D
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	5	MR, UR
Unidentified bat	<i>Myotis</i>	2	

Key to Indicators	
M/S	Mating/swarming
H	Hibernaculum
FR	Feeding roost
MR	Maternity roost
UR	Unspecified roost
D	Droppings

### Dormice

Though there is only one record for Dormouse within 2km, and no signs of dormice were found during the site visit, it is suggested that dormice are likely to use hedgerows for commuting between the substantial blocks of woodland in the vicinity as well as potentially foraging along the length of trackbed that is now woodland and scrub. None of the nuts that were found along the path, or at points where the site was accessible, indicated the presence of dormice *Muscardinus avellanarius*, although several appeared to have been opened by grey squirrel *Sciurus carolinensis*.



### Water Vole

The SxBRC report shows two records for water vole within 2km of the site in the last twenty years. At points where the footpath is close to the river (TN7) evidence of water vole or otter were searched for but field signs were absent although there is potential for them to be using the river and nearby ditches. The ponds in the line of the proposed track are unlikely to support Water vole due to the fact that they are isolated from the wider riparian/water course system.

### Otter

The SxBRC do not display records for Otter as they are confidential. The river is considered to be suitable for commuting and foraging otters, although they are likely to be disturbed by people and dogs where, the footpath runs adjacent to the river. Otters are present in the catchment and the Sussex Otter and Rivers Project (SORP) officer reports that there has been one recent unconfirmed sighting in this area. Otters are not confined to a watercourse and its banks and may shelter hundreds of metres away. During the survey visit no field signs, such as footprints, runways or spraints were found.

### Badger

A badger sett, with signs of bedding having been dragged in from the recently cut hay field, was found towards the eastern end of the site along the line of the proposed track (TN2) and the remainder of the extant embankment will have a very high likelihood of supporting further setts. There are limited foraging opportunities for badger along the trackbed itself but substantial opportunity exists in the immediate surrounding countryside.

Figure 3 – Grid reference for records of selected protected species



## EVALUATION AND RECOMMENDATIONS

The phase I habitat survey has identified that much of the site, especially towards the eastern end, is under the cover of broadleaved woodland and scrub and the woodland component appeared to be dominated by mature ash and oak with an understory of hazel, hawthorn, field maple, ivy, dog rose and bramble all of which is prime habitat for Dormouse. Where the track bed has been entirely removed the site crosses arable and pastoral farmland, ponds, scrub and flood plain grazing marsh. Due to the limitations of access it was not possible to walk the entire length of the proposed route.

The site has potential to support, Badger, Bats, Birds, Dormice, Great Crested Newts and Reptiles.

This report makes the following recommendations to be carried out prior to works commencing:

- **Badger** – evidence of badgers setts and foraging activity was identified during the extended Phase I survey. A full walkover of the site would need to be completed in order to identify any additional potential setts before. An activity survey should be carried out using, amongst other methods, ‘trail cameras’ to establish whether individual setts and outlying holes are in use. Given the nature of the proposed development (the railway will generally not be running during periods of badger activity) it is not thought that, beyond requiring Natural England licences and sensitive working practices during the construction period, any mitigation or compensation will be required.
- **Bats** – The desktop study highlighted a number of commoner bat species noted in the vicinity including Brown long-eared, Soprano pipistrelle and Daubenton’s bat. The proposed line contains relatively recent secondary woodland (as illustrated by old aerial photographs showing substantial lengths with no tree cover at all) which, as a result, will be unlikely to contain many trees mature enough to offer potential roosting sites. That said the whole site should be assessed in order to identify any trees that may offer some potential as roosting habitat. Conversely, the immediate surrounding area of the line contains a number of suitable trees which could provide suitable roost sites. In addition to this are two derelict railway bridges, at least one of which (TN11) is sufficiently substantial as to also provide potential roost sites. A flight line survey should be undertaken (transects and/or automatic bat detectors) to assess the likely impact and inform any mitigation that may be deemed necessary should a development occur. Equally, any potential roosts such as the remnant bridge or suitable roosts particularly close to the line should have a preliminary roost assessment which may lead to further survey work if necessary.
- **Great crested newt** – Three putative ponds lie directly in the path of the proposed link but are all located on currently inaccessible holdings. These ponds,



assuming they provide suitable habitat, should, where possible, be surveyed for GCN in addition to the seven ponds within 500m

- Dormouse – A significant proportion of the line, where the embankments have not been levelled, has now largely succeeded to secondary woodland although some areas contain more mature trees and others less so but still potentially suitable habitat for Dormouse . These lengths of woodland are also linked via suitable habitat to the substantial blocks of Ancient Woodland to the south in Fowlbrook and Lordship Wood. In addition to this the SxBRC report has records from 2009 for Dormouse just to the west of the proposed line. It is proposed that a Dormouse survey is undertaken to include nest tube surveys and a nut search. The former would need to take place, ideally, straddling the active season of April to October whilst the latter should occur between September and December, Should Dormice be shown to be present there will be significant constraints to the timing of any vegetation clearance and a requirement for compensatory habitat to be created.
- Reptiles – The SxBRC report has several records for Grass snake, Slow-worm and Common Lizard within 2km of the link and the extended Phase I survey also identified a number of suitable areas of habitat whether on more open areas of the relict embankment or along grassy boundaries beside hedges and ditches. It is therefore proposed that a presence/absence reptile survey is undertaken on suitable habitat along the proposed route.
- Water vole – The SxBRC report identifies 2 recent records for Water vole within 2km of the line including one from a pond beside Moat Farm (TQ757242) and the extended Phase I survey noted a number of ditches and watercourses with potential for supporting these mammals. As the ponds on the course of the proposed route are not linked to the wider network of watercourses it is unlikely that water voles will be using them.
- Otter - The SxBRC do not display records for Otter as they are confidential. The river is considered to be suitable for commuting and foraging otters, although they are likely to be disturbed by people and dogs where, the footpath runs adjacent to the river. Otters are present in the catchment and the SORP officer has reported that there had been recent sightings to the immediate east. Otters are not confined to a watercourse and its banks and may shelter hundreds of metres away. During the survey visit no field signs, such as footprints, runways or spraints were found. No further survey work is recommended as it is not thought that any proposals would materially affect otters.
- Birds – The extended Phase I survey area and the wider inaccessible land alongside the proposed route was considered to have potential for a range of breeding and wintering bird species although the only Schedule I WCA species noted in the SxBRC report and which have potential to be affected by the proposals are Kingfisher and Barn owl although given the nature of the development it is not thought that the effect will be significant. No further survey work is recommended.



- Invertebrates - The matrix of running and standing water along with the scrub and woodland habitats which contain a deadwood component indicate that the site is likely to support a good range of invertebrate species. The biological records did not reveal any recent records of any protected or BAP invertebrates. No further survey work is considered necessary

An arboricultural survey of trees within 50m of the proposed line and in proposed construction compound areas will need to be undertaken (to include tree protection zones).



## SUMMARY

Given the potential ecological value of the site and in the light of the current access constraints the following further surveys have been suggested before construction goes ahead.

- Reptile survey - Direct observation/refugia survey (April to September)
- Great crested newt survey – three survey methods selected from netting, torch surveys, egg searches and bottle trapping (March to June)
- Dormouse survey – Nest tube survey (April to October), Nut search (September to December)
- Bat survey - Flightline and roost inspection survey (May to Mid October).
- Badger survey - Surveys for badger setts can be undertaken at any time of year although monitoring of any sett entrances should take place over an extended period.
- Arboricultural survey

It should be noted that ecological best practice should be followed as a matter of course with any clearance work taking place outside of bird nesting periods and under the supervision of an Ecological Clerk of Works.



## References

Joint Nature Conservation Council (2007) UK BAP list of priority habitats  
<http://jncc.defra.gov.uk/page-5706>

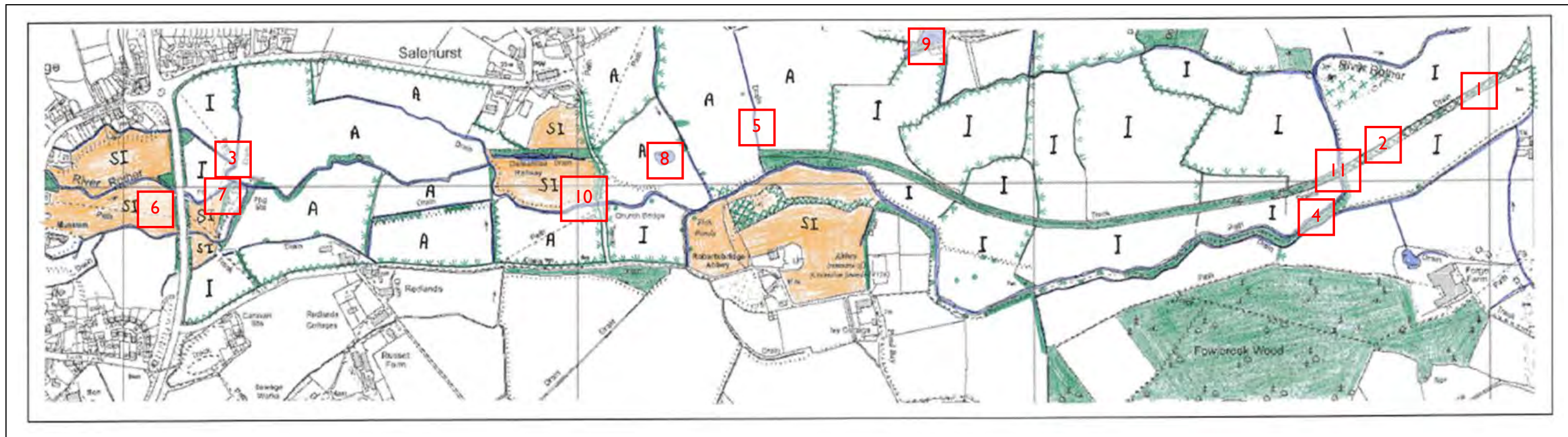
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Stace, C (1997) A New Flora of the British Isles. Cambridge University press, Cambridge

English Nature (2001) Great crested newt mitigation guidelines

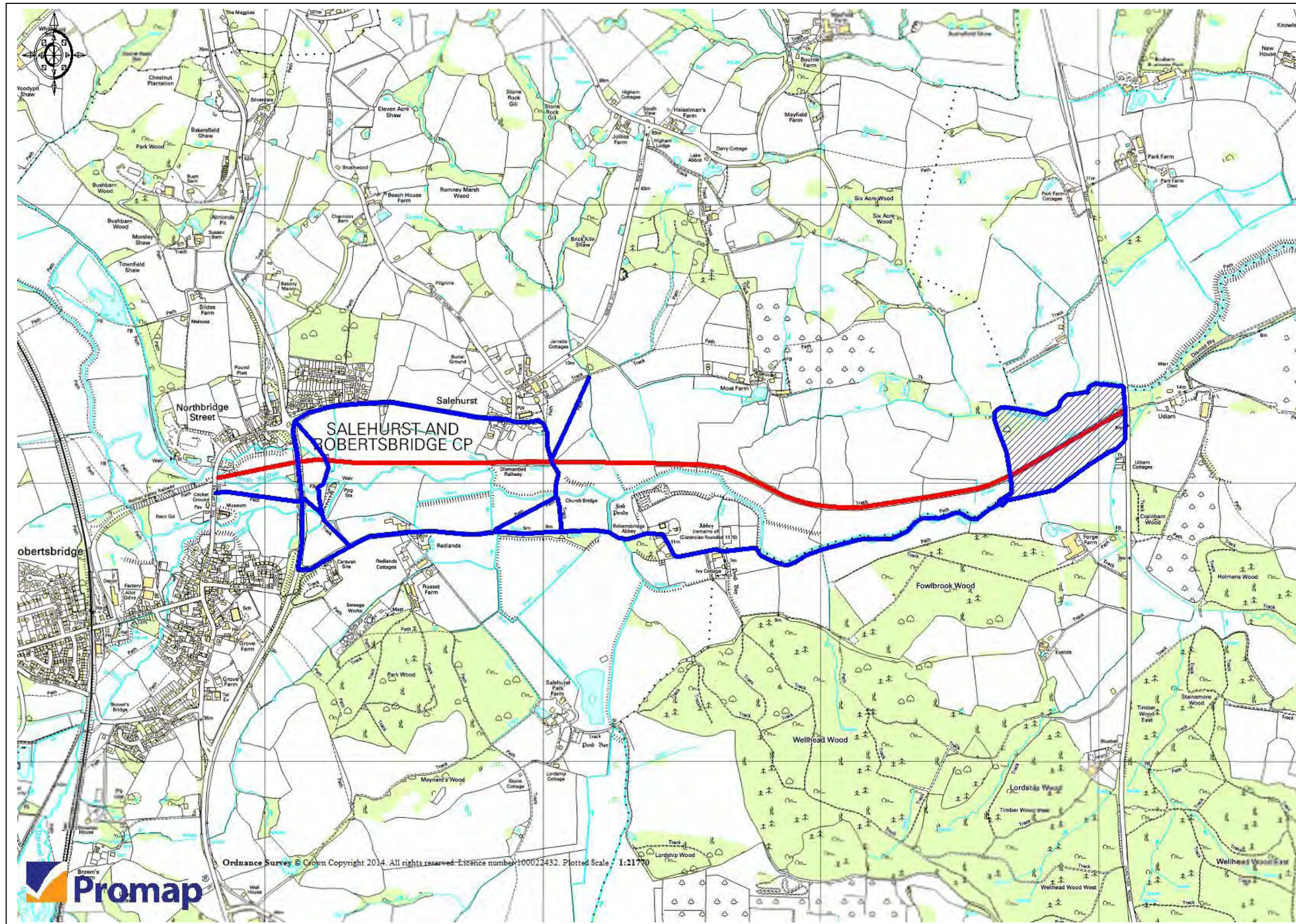


## APPENDIX I: Map of Habitats on Site



- |  |  |
|--|--|
|  Woodland, broadleaved semi natural |  Dense scrub                  |
|  Neutral semi improved grassland    |  Species rich hedge and trees |
|  Improved grassland                 |  Native species rich hedge    |
|  Running water                      |  Woodland mixed semi natural  |
|  Scattered scrub                    |  Standing water               |
|  Scattered broadleaved trees        |  |

## APPENDIX 2: Areas accessible during the site visit



## APPENDIX 3: Target Notes

Target Note Number	Phase I description	Description	Protected species potential
1	Dense scrub	Area of dense scrub succeeding to secondary woodland	Dormouse Badger Birds
2		Potential badger sett	Badger
3		Mature and standing dead in-field oaks	Bats Birds
4	Running water Woodland, broadleaved seminatural	The River Rother	Bats Badgers Birds Water vole
5	Running water	Ditches flowing into the Rother	Bats Birds Water vole
6	Neutral semi improved grassland	Putative area of Grazing marsh BAP habitat	Badgers Bats Great crested newts Water vole Reptiles
7	Running water	Watercourses which could be assessed for Water vole and Otter due to proximity to footpaths	Otter Water vole
8	Standing water	Pond with potential for Great crested newt and water vole	Great crested newt Water vole
9	Standing water	Pond with potential for Great crested newt and water vole	Great crested newt Water vole
10	Native species rich hedge	Double hedgerow linking blocks of habitat	Bats Dormouse Reptiles
11	Building	Derelict railway bridge	Bats

## APPENDIX 4: Photos

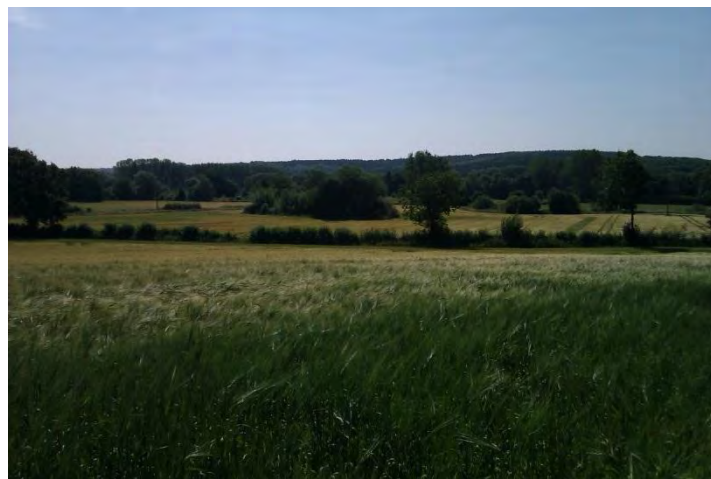
	<p>Mature oak tree (target note 3)</p>
	<p>Standing dead oak tree (target note 3)</p>
	<p>Northern section of native species rich hedgerow offering potential habitat for bats and dormice. (target note 10)</p>



Southern section of native species rich hedgerow offering good habitat for bats and dormice. (target note 10)



View across semi improved grassland to north west of TN10.



View towards an isolated pond within a block of arable land (target note 8)



Area of dense scrub succeeding to secondary woodland along eastern end of trackbed (target note 1)



Badger sett entrance within dense scrub/secondary woodland lying directly on track bed (target note 2)

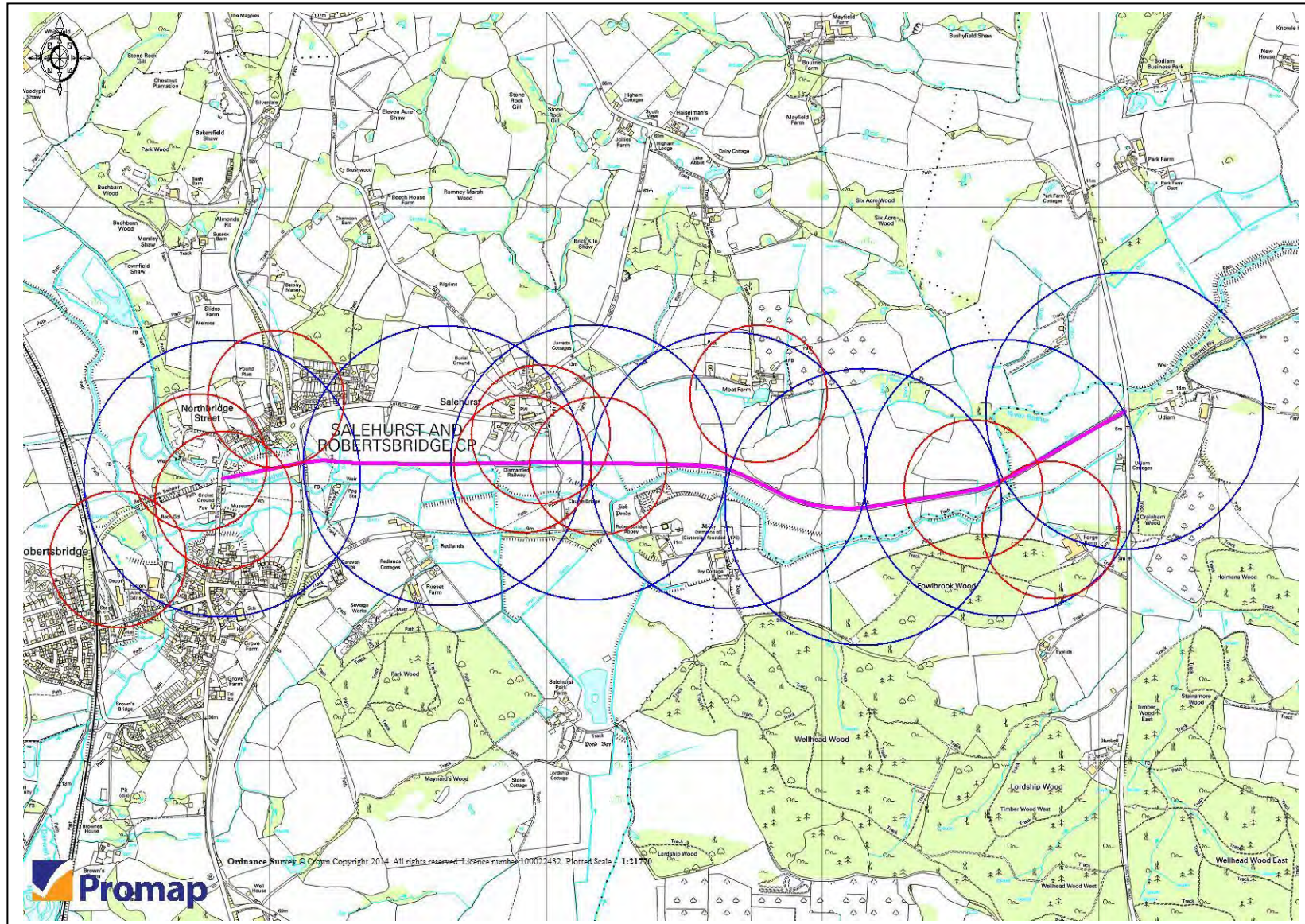


Derelict railway bridge (target note 11)



Mature oak tree with hole beside the Rother (target note 4)

## APPENDIX 5: Location of ponds within 500m of site and proximity of ponds to others,



## APPENDIX 6: Summary of protected species legislation

### Legal protection of great crested newt and other amphibians in Britain

#### **Fully protected species (include)**

Great crested newt *Triturus cristatus*

Great crested newts are a European Protected Species and receive full and stringent protection under The Conservation of Habitats and Species Regulations 2010 and the Wildlife and Countryside Act (1981) (as amended). This legislation taken together prohibits the following on any of these species:

- Deliberately, intentionally or recklessly, injuring, killing and capturing
- Deliberately, intentionally or recklessly disturbing
- Deliberately, intentionally or recklessly taking or destroying eggs
- Deliberately, intentionally or recklessly destroying a breeding site or resting place or damaging or obstructing a resting place used for shelter or protection
- Keeping, transporting, selling or exchanging; offering for sale or advertising.

Consequently not only are the animals themselves protected, but so is their habitat, and activities that damage or impede the use of this habitat are prohibited.

#### **Partially protected species**

Protected under the 1981 Wildlife and Countryside Act against sale only

- Smooth newt *Lissotriton vulgaris* prev. *Triturus vulgaris*
- Palmate newt *Lissotriton helveticus* prev. *Triturus helveticus*
- Common frog *Rana temporaria*
- Common toad *Bufo bufo*

Please see the Primary Legislation for a complete explanation of the current law.

### **Legal status of bats in the UK**

In England and Wales, the relevant legislation is the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and the Conservation of Habitats and Species Regulations (2010). Within this legislation all bats are listed as being 'European Protected Species'.

Under legislation it is an offence for any person to:

- Intentionally kill, injure or take a bat.
- Possess or control a live or dead bat, any part of a bat, or anything derived from a bat.
- Intentionally or recklessly damage, destroy or obstruct access to any place that a bat uses for shelter or protection.
- Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.
- Sell, offer or expose for sale, or possess or transport for the purpose of sale, any live or dead bat, any part of a bat, or anything derived from a bat. It is also an offence to publish, or cause to be published, any advertisement likely to be understood as conveying that they buy or sell, or intend to buy or sell, any live or dead bat, part of a bat or anything derived from a bat. Sale includes hire, barter and exchange.
- Set and use articles capable of catching, injuring or killing a bat (for example a trap or poison), or knowingly cause or permit such an action. This includes sticky traps intended for animals other than bats.

Please see the Primary Legislation for a complete explanation of the current law.

### **Legal protection of reptiles in Britain**

The smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* are fully protected under the Conservation (Natural Habitats & c.) Regulations 1994 and the Wildlife and Countryside Act 1981, as amended. The adder *Vipera berus*, grass snake *Natrix natrix*, common/viviparous lizard *Zootoca vivipara* and slow-worm *Anguis fragilis* are protected under the 1981 Wildlife and Countryside Act against killing, injuring and sale etc

Threats to reptile populations include loss of habitat and habitat fragmentation.

Please see the Primary Legislation for a complete explanation of the current law.

### **Legal protection of dormouse in Britain**

Dormice are covered by the same legislation as bats and great crested newts being listed on Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and within Annex IV of the Habitats Directive. The 1981 Act was recently amended by the Countryside and Rights of Way (CROW) Act 2000 and the more recent Habitats Regulations amendments (2007). Subject to the provisions of Section 9 of the WCA, it is an offence to:

- Intentionally kill, injure or take a dormouse [Section 9(1)];
- Possess or control any live or dead specimen or anything derived from a dormouse [Section 9(2)]
- Intentionally or recklessly disturb a dormouse while it is occupying a structure or place which it uses for shelter or protection [Section 9(4)(b)];
- Intentionally or recklessly obstructs access to any structure or place which a dormouse uses for shelter or protection [Section 9(4)(c)]
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a dormouse [section 9(5)]

Dormice are also included on Annex IV of Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the Habitats Directive). As a result of the UK ratifying this directive, dormice are protected under The Conservation Regulations 1994 (the Habitat Regulations) (as amended 2007). Annex IV of the Habitats Directive requires member states to construct a system of protection as outlined in Article 12, this is done through Schedule 2 of the Regulations whereby Regulation 39 makes it an offence to:

- Deliberately capture or kill a dormouse [Regulation 39(1)(a)];
- Deliberately disturb a dormouse in such a way as to be likely to significantly affect i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young, OR ii) the local distribution of that species. [Regulation 39(1)(b)];
- Damage or destroy a breeding site or resting place of a dormouse [Regulation 39(1)(d)].

Please see the Primary Legislation for a complete explanation of the current law.

### **Legal protection of badgers in Britain**

Badgers are protected by the Protection of Badgers Act 1992. All the following are criminal offences:

- to wilfully kill, injure, take, possess or cruelly ill-treat a badger;
- to attempt to do so; or
- to intentionally or recklessly interfere with a sett.

Please see the Primary Legislation for a complete explanation of the current law.

### **Legal protection of birds in Britain**

Under the Wildlife and Countryside Act 1981, a wild bird is defined as any bird of a species that is resident in or is a visitor to the European Territory of any member state in a wild state.

Game birds however are not included in this definition (except for limited parts of the Act). They are covered by the Game Acts, which fully protect them during the close season.

All birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions (see *Exceptions*), to:

- intentionally kill, injure or take any wild bird
- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built
- intentionally take or destroy the egg of any wild bird
- have in one's possession or control any wild bird, dead or alive, or any part of a wild bird, which has been taken in contravention of the Act or the Protection of Birds Act 1954
- have in one's possession or control any egg or part of an egg which has been taken in contravention of the Act or the Protection of Birds Act 1954
- use traps or similar items to kill, injure or take wild birds
- have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered, and in most cases ringed, in accordance with the Secretary of State's regulations (see *Schedules*)
- intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Please see the Primary Legislation for a complete explanation of the current law.

## **APPENDIX 7: SXBRC Report**

#### **4) Flood Risk Assessment (Capita)**

## Rother Valley Railway

Flood Risk Assessment

December 2013



# Executive Summary

1. Capita Property and Infrastructure Ltd (Capita) was commissioned by Rother Valley Railway Limited to undertake a Flood Risk Assessment (FRA) for the proposed reinstatement of the Rother Valley Railway between Robertsbridge and Udiam (Bodiam). The route is approximately 3.5 km and will link the existing railway between Bodiam and Robertsbridge. The proposed scheme includes reinstating the raised embankment, culverts and bridges.
2. The site is located in the Rother catchment. The River Rother flows in an easterly direction for approximately 30 km before flowing into the English Channel, at Rye. The Darwell Stream is a tributary of the Rother that joins the main flow at Robertsbridge. The area has been subjected to quite severe flooding over the last 20 years and a flood defence scheme was put in place for Robertsbridge in 2004.
3. The FRA has been prepared following guidance provided in the National Planning Policy Framework (March 2012) and the Technical Guidance to the National Planning Policy Framework (March 2012). The site has been modelled using ISIS and TUFLOW which are established software packages used for modelling rivers and floodplains. The modelling covered a number of flooding scenarios and compared the “without railway” baseline (i.e. the existing condition) with the Rother Valley Railway constructed scenario.
4. The work was carried out in close liaison with the Environment Agency and the key results are based on a 1% AEP (100 year) design flood event. This design flood event was utilised for the design of the flood protection works to Robertsbridge in 2003. The river modelling techniques currently available are more advanced than those available in 2003. The modelling undertaken for this FRA (2013) and by the Environment Agency in 2011 shows that minor overtopping of the existing flood protection scheme occurs at some locations for a 1% AEP flood event.
5. The modelling found that the construction of the railway would have a small effect on the flooding during a 1% AEP design flood event in Robertsbridge and on the downstream floodplain. The potential increase in flood levels is predicted to vary between 0.02 and 0.07 m at key locations in the study area (Table 4.2). Small sections of the defences are overtopped in both the existing (baseline) and ‘with railway’ scenario in the 1% AEP design flood event, although flooding behind defences is limited to the Mill site west of The Clappers/Northbridge Street. Full details are in paragraph 4.5.10
6. This report recommends raising the defences at the small number of vulnerable points to achieve the protection in the 1% AEP (100 year) flood event that the defences were designed to provide for the current (baseline) situation and to take account of the railway re-construction. In the ‘with railway and defences raised’ scenario there is no overtopping of the defences for the 100 year design flood event.
7. This FRA also considers future flood risk. To investigate future flood risk modelling was undertaken for the 1% AEP (100 year) with climate change flood event (this includes a 20% increase in the 1% AEP flood event flows). The model predicts overtopping of the defences in both the existing (baseline) and ‘with railway’ scenarios.
8. Following discussion with the Environment Agency this report also recommends raising the defences in a few additional locations in Robertsbridge to manage future flood risk. Details of the short lengths of defences involved are shown in Figure 10 (for the 1% AEP flood event) and Figure 11 (for the 1% AEP with climate change flood event).

9. The proposed railway is at risk of flooding during the 5% AEP design flood event in the area upstream of Udiam. However, the consequences of flooding will be managed through the train operators signing up for flood warnings and ceasing services when there is a risk of flooding.
10. The proposed railway is considered at low risk of surface water/sewer flooding. The track is generally higher than the surrounding ground and water is considered unlikely to pond on the tracks in significant volumes. The railway line will be built on a permeable base with no significant change in surface water run-off.
11. The proposed railway is considered at low risk of groundwater flooding and low to medium risk of flooding from artificial sources. The approach to managing the residual risk of flooding from artificial sources is discussed in section 5.5.

The table below summarised key aspects of the study:

<b>Site Name</b>	Rother Valley Railway, Robertsbridge
<b>Location</b>	Northbridge Street to Junction Road, Udiam
<b>Client</b>	Rother Valley Railway Ltd
<b>Grid Reference</b>	NGR TQ7380724014 to TQ7718624322
<b>Length of Railway</b>	3.5 km
<b>EA Flood Zone Classification</b>	Flood Zone 3
<b>SFRA</b>	Rother District Council SFRA
<b>Current Site Use</b>	Site of dismantled railway - farm land
<b>Description of proposed development</b>	Reinstate historic railway line in the Rother Valley
<b>Vulnerability Classification</b>	Less vulnerable
<b>History of Flooding</b>	The Robertsbridge area has experienced flood events in 1946, 1960, 1979, 1985, 1993, 1999, 2000, and 2008. The 2000 was severe with approximately 90 properties flooded, some to a depth of 1.5 metres.
<b>Flood Defences</b>	A flood alleviation scheme was constructed at Robertsbridge and Northbridge Street in 2003/4.
<b>Summary of Risks</b>	Fluvial – High Surface Water – Low Groundwater – Low Artificial Sources - Low to medium

## Contents

Executive Summary	i
1 Introduction	1
1.1 Scope of Assessment	1
1.2 Responsibility	1
2 Policy and Guidance	2
2.1 Flood and Water Management Act, 2010	2
2.2 National Planning Policy Framework (NPPF) March 2012	3
2.3 Technical Guidance to the National Planning Policy Framework March 2012	3
2.4 Rother Local Plan	4
2.5 Strategic Flood Risk Assessment (SFRA)	5
2.6 UK Climate Impact Programme 2009 (UKCIP09)	5
3 Development Site Planning Considerations	7
3.1 Development Description and Location	7
3.2 Vulnerability Classification	7
3.3 Sequential and Exception Test	9
4 Flood Probability and Hazard	10
4.1 Catchment Background	10
4.2 Site Topography	11
4.3 Flood Zone	11
4.4 Existing Flood Risk Management Infrastructure	11
4.5 Sources of Flooding – Actual Flood Risk	12
5 Flood Risk Management	22
5.1 Principles of Flood Risk Management	22
5.2 Flood Risk Management along the Rother Valley Railway	22
5.3 Management of Fluvial Flood Risk along the Railway	22
5.4 Management of Fluvial Flood Risk to Robertsbridge and Northbridge Street	22
5.5 Management of Residual Risk of flooding from reservoirs	23
5.6 The Environment Flood Warning and Evacuation plan	23
6 Conclusion	24

## Tables

Table 4.1 Historic flood events at Robertsbridge	10
Table 4.2 Flood Levels along the proposed reinstated railway	13
Table 4.3 Flood Levels	15

## Figures

Figure 1 - Proposed Route of Railway	7
Figure 2 - Environment Agency Flood Zone 3	8
Figure 3 - 1% AEP design flood extent for the three scenarios	12
Figure 4 - The locations referred to in Table 4.2	13
Figure 5 - The locations referred to in Table 4.3	15
Figure 6 – 5% AEP design event Flood Extents	17
Figure 7 – 1% AEP design event Flood Extents	18
Figure 8 – Difference in water level (1% AEP design event) between the baseline and 'with railway and raised defences' scenarios.	18
Figure 9 – 1% AEP with climate change design event for all three scenarios.	19

Figure 10 - The locations at Northbridge Street where the raising the defences is proposed	20
Figure 11 - The locations at Robertsbridge where the raising the defences is proposed	20

**Appendices**

Appendix A - Additional Policies
----------------------------------

# 1 Introduction

## 1.1 Scope of Assessment

- 1.1.1 Capita Property and Infrastructure Ltd (Capita) was commissioned by Rother Valley Railway Limited to undertake a Flood Risk Assessment (FRA) for the proposed reinstatement of the Rother Valley Railway between Robertsbridge and Udiam (NGR TQ 73807 24014 to TQ 77186 24322). The route length is approximately 3.5 km and will link the existing railway between Bodiam and Robertsbridge. The proposed scheme includes reinstating the raised embankment and bridges along this route.
- 1.1.2 The contents of this FRA describe the assessment of the proposed site redevelopment and the implications of the proposed uses on flood risk. The FRA has been prepared following guidance provided in the National Planning Policy Framework (March 2012) and the Technical Guidance to the National Planning Policy Framework (March 2012).
- 1.1.3 A planning application is being submitted and this assessment seeks to provide the level of detail necessary to demonstrate that the potential effects of the proposal with respect to flood risk have been addressed by:
- Identifying the source and probability of flooding to the application site, including effects of climate change;
  - Determining the consequences of flooding to and from the proposed development proposal;
  - Determining the consequences of flooding to the local area and advising on how this will be managed; and
  - Demonstrating the flood risk issues described in this assessment are compliant with the relevant guidance.
- 1.1.4 An assessment of areas potentially at risk from flooding was undertaken and the proposals were examined in relation to their potential to increase flood risk. The layout of the river crossings and flood relief culverts for the railway embankment has been developed considering flood risk at all stages throughout the process. The final development layout reflects the flood risk constraints and the need to manage, and where possible reduce, flood risk.

## 1.2 Responsibility

- 1.2.1 Rother Valley Railway Limited is promoting the reinstatement of the historic railway. The layout designers are professional volunteer members who are responsible for the formulation of the design layout and drawings. Capita are responsible for assessing the scheme with respect to its flood risk impact. The assessment is based on the scheme design and site data provided by the designers and developers.

## 2 Policy and Guidance

### 2.1 Flood and Water Management Act, 2010

2.1.1 Combined with the Flood Risk Regulations 2009, (which enact the EU Floods Directive in the England and Wales) the Act places significantly greater responsibility on Local Authorities to manage and lead on local flooding issues. The Act and The Regulations together raise the requirements and targets Local Authorities need to meet, including:

- Playing an active role leading Flood Risk Management;
- Development of Surface Water Management Plans (SWMP);
- Implementing requirements of Flood and Water Management legislation;
- Preparation of preliminary flood risk assessments and flood risk management plans;
- Development and implementation of drainage and flooding management strategies; and
- Responsibility for first approval, then adopting, management and maintenance of Sustainable Urban Drainage System (SUDS).

2.1.2 The Flood and Water Management Act also clarifies three key areas that influence development:

1. *Sustainable drainage (SUDs)* - the Act makes provision for a national standard to be prepared on SUDS, and developers will be required to obtain local authority approval for SUDS in accordance with the standards, likely with conditions. Supporting this, the Act requires local authorities to adopt and maintain SUDS, removing any ongoing responsibility for developers to maintain SUDS if they are designed and constructed robustly.
2. *Flood risk management structures* - the Act enables the EA and local authorities to designate structures such as flood defences or embankments owned by third parties for protection if they affect flooding or coastal erosion. A developer or landowner will not be able to alter, remove or replace a designated structure or feature without first obtaining consent.
3. *Permitted flooding of third party land* - The EA and local authorities have the power to carry out work which may cause flooding to third party land where the works are deemed to be in the interest of nature conservation, the preservation of cultural heritage or people's enjoyment of the environment or of cultural heritage.

## 2.2 National Planning Policy Framework (NPPF) March 2012

- 2.2.1 In determining an approach for the assessment of flood risk for the proposal there is a need to review the policy context. Government Guidance requires that consideration be given to flood risk in the planning process. The National Planning Policy Framework was issued in March 2012 and outlines the national policy on development and flood risk assessment. This replaced with immediate effect Planning Policy Statement 25.
- 2.2.2 The Framework states that the inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.
- 2.2.3 The essence of NPPF is that:
- Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards;
  - Policies in development plans should outline the consideration, which will be given to flood issues, recognising the uncertainties that are inherent in the prediction of flooding and that flood risk is expected to increase as a result of climate change;
  - Planning authorities should apply the precautionary principle to the issue of flood risk, using a risk based search sequence to avoid such risk where possible and managing it elsewhere;
  - The vulnerability of a proposed land use should be considered when assessing flood risk;
  - Use opportunities offered by new developments to reduce the causes and impacts of flooding;
  - Planning authorities should recognise the importance of functional floodplains, where water flows or is held at times of flood, and avoid inappropriate development on undeveloped and undefended floodplains;
  - The concept of Flood Risk Reduction, particularly in circumstances where development has been sanctioned on the basis of the "Exception Test".

## 2.3 Technical Guidance to the National Planning Policy Framework March 2012

- 2.3.1 The Technical Guidance to the National Planning Policy Framework provides additional guidance to local planning authorities to ensure the effective implementation of the planning policy set out in the National Planning Policy Framework on development in areas at risk of flooding. The guidance retains key elements of the now superseded PPS 25.
- 2.3.2 The document provides supporting information on:
- The application of the sequential approach and Sequential and Exception Tests;
  - Measures to reduce flood risk to acceptable levels;

- How to manage residual risks; and
- Guidance on how to take climate change into account.

## 2.4 Rother Local Plan

2.4.1 Rother District Local Plan (2006) sets out the vision and strategy for land use and development in Rother District. It includes specific planning policies and proposals that will be applied to manage development and change up to 2011. The Local Plan, together with the adopted South East Plan, comprises the statutory 'development plan' for Rother, as all the Local Plan policies have been 'saved' by the Secretary of State. An exercise to determine which 'saved' local plan policies are consistent with the NPPF was undertaken and was considered by Cabinet on 2nd July 2012. No Local Plan policy was found to be not compliant with the NPPF, but one policy, DS6 - Managing Housing Release, which was found to be only partially compliant with the NPPF.

2.4.2 The Local Plan policies relevant to the Rother Valley Railway reinstatement are 'EM7 – New or extended tourist attractions/facilities' and 'EM8 - Bodiam/Robertsbridge railway' and are detailed below.

### POLICY EM7

**Proposals for new or extended tourist attractions or visitors facilities will be permitted where they accord with Policies DS1 and GD1. In the countryside outside development boundaries, if the development is not clearly ancillary to an existing visitor facility or tourist attraction, it will be necessary to demonstrate that a countryside location is necessary.**

2.4.3 The Local Plan state:

*"Consideration has been given to extend the Kent and East Sussex Steam Railway line westwards from Bodiam to Robertsbridge to link with the main line services from Hastings to London.*

*The tourism advantages are acknowledged and the proposed route would largely follow the former trackbed. There are major issues that would need to be addressed. The Highways Agency has advised that a level crossing where the track would traverse the A21 Robertsbridge Bypass would be unacceptable, while there are environmental and technical difficulties with other options including the impacts on flood risk areas. The Local Highway Authority has similarly indicated that it does not favour a level crossing of the B2244. Also, the route runs along the high quality and distinctive landscape of the Lower Rother Valley, the character and general tranquillity of which should be maintained. The Council wishes to indicate its support in principle for the extension of the Kent and East Sussex Steam railway to Robertsbridge, while detailed proposals must satisfactorily address environmental and road crossing issues."*

### POLICY EM8

**An extension to the Kent and East Sussex Steam Railway from Bodiam to Robertsbridge, along the route identified on the Proposals Map, will be supported, subject to a proposal meeting the following criteria:**

1. it must not compromise the integrity of the floodplain and the flood protection measures at Robertsbridge;
2. it has an acceptable impact on the High Weald Area of Outstanding Natural Beauty;
3. it incorporates appropriate arrangements for crossing the A21, B2244 at Udiham, Northbridge Street and the River Rother.

2.4.4 The Local Plan state:

*“Consideration has been given to extend the Kent and East Sussex Steam Railway line westwards from Bodiam to Robertsbridge to link with the main line services from Hastings to London. Overall throughout the District, there are over 30,000 bedspaces available in the holiday season which includes accommodation in hotels, motels, guesthouses, self catering flats and cottages, holiday chalets, static and touring holiday caravans.”*

2.4.5 The policies referred to in EM7 namely DS1 and GD1 are detailed in Appendix B.

## 2.5 Strategic Flood Risk Assessment (SFRA)

2.5.1 A Strategic Flood Risk Assessment SFRA was undertaken in 2008 by Rother District Council. The primary objective of the SFRA is to inform the revision of flooding policies, including the allocation of land for future development, within the emerging Local Development Framework (LDF). The SFRA has a broader purpose however, and in providing a robust depiction of flood risk across the District, it can:

- Inform the development/developer of Council policy that will underpin decision making within the District, particularly within the areas that are affected by (and/or may adversely impact upon) flooding;
- Assist the development control process by providing a more informed response to development proposals affected by flooding, influencing the design of future development within the District;
- Help to identify and implement strategic solutions to flood risk, providing the basis for possible future flood attenuation works;
- Support and inform the Councils emergency planning response to flooding; and
- Identify what further investigations may be required in flood risk assessments for specific development proposals.

2.5.2 A number of conclusions and recommendations were drawn from the SFRA. The following are considered the most relevant to this FRA:

- The SFRA process has highlighted the importance of flood defences throughout Rother District. Future policy should seek to address how these defences are to be maintained to ensure that they are maintained to the current high level of protection.
- Review the condition of existing local defences, the dependence of additional local development on them for flood mitigation and where necessary the Council should seek to maintain and or improve defences if necessary.
- Require all flood risk assessment and sustainable drainage design to consider the impacts of climate change for the lifetime of the development at the site and downstream.

## 2.6 UK Climate Impact Programme 2009 (UKCIP09)

2.6.1 In June 2009 the UK Climate Impact Programme released new guidance with respect to climate change predictions. The predictions have moved from a deterministic approach (i.e. one range of outcomes) to a probabilistic approach (i.e. a range of possible outcomes based on a range of climate change scenarios).

2.6.2 The results indicate that based on a central estimate of likely outcomes (i.e. 50 percentile), increases in rainfall are expected to remain similar to those predicted by UKCP02 (i.e. those

used in this FRA). A high estimate of likely outcomes (i.e. 95 percentile) could result in significantly more intense rainfall than at present.

## 3 Development Site Planning Considerations

### 3.1 Development Description and Location

- 3.1.1 The proposed development is the reinstatement of the Rother Valley Railway between Northbridge Street and Udiam (NGR TQ7380724014 to TQ7718624322). The route is approximately 3.5 km and will link the existing railway between Bodiam and Robertsbridge. The proposed scheme includes reinstating the raised embankment and bridges. Figure 1 shows the route of the proposed railway.

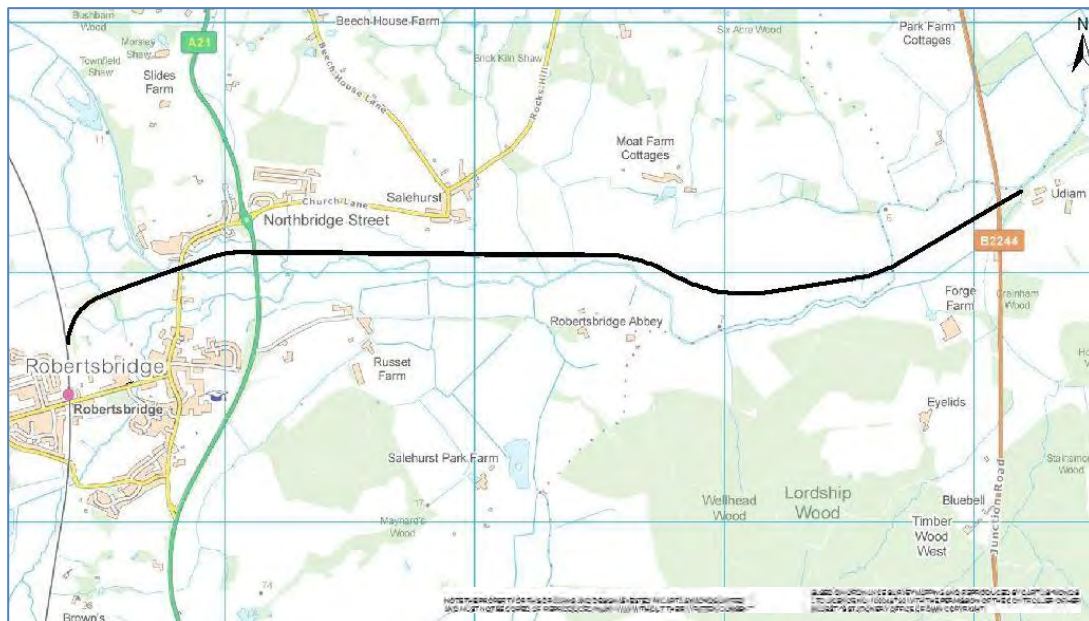


Figure 1 - Proposed Route of Railway

### 3.2 Vulnerability Classification

- 3.2.1 The site lies within the Environment Agency's Flood Zone 3, which is described within the NPPF Technical Guidance Table 1 as having a 'High Probability' of flooding. Flood Zone 3 comprises of land assessed as having a 1 in 100 or greater annual probability of flooding ( $>1\%$ ), or a 1 in 200 or greater annual probability of flooding from the sea ( $>0.5\%$ ) in any year. The Environment Agency's flood zone map is provided in Figure 2.
- 3.2.2 The proposed railway is considered to fall under the classification of "Less Vulnerable" land use based on Table 2 of NPPF Technical Guidance. Table 3: Flood Risk Vulnerability and Flood Zone Compatibility in NPPF Technical Guidance, states that these land uses are compatible in Flood Zone 3a.
- 3.2.3 The railway does cross the 5% (1 in 20 year) AEP Flood Extent, which defines the functional floodplain. However the majority of the railway line is above the 5% AEP flood level and the construction of the railway does not increase the extent of flooding. A number of culverts and

sections of viaduct are proposed to maintain connectivity across the floodplain, allowing water to flow and be stored within the existing floodplain extents during times of flood. A short section of the railway upstream of the B2244 near Udiam is flooded in the 5% AEP flood extent, but the location and level of the railway cannot be altered due to it following the historic route and linking two existing sections of railway. The consequences of flooding will be managed through the train operators signing up for flood warnings and ceasing services when there is a risk of flooding. Following correspondence with the Environment Agency we understand that given the railway location cannot be changed the Environment Agency has no objections to the railway crossing the functional floodplain.

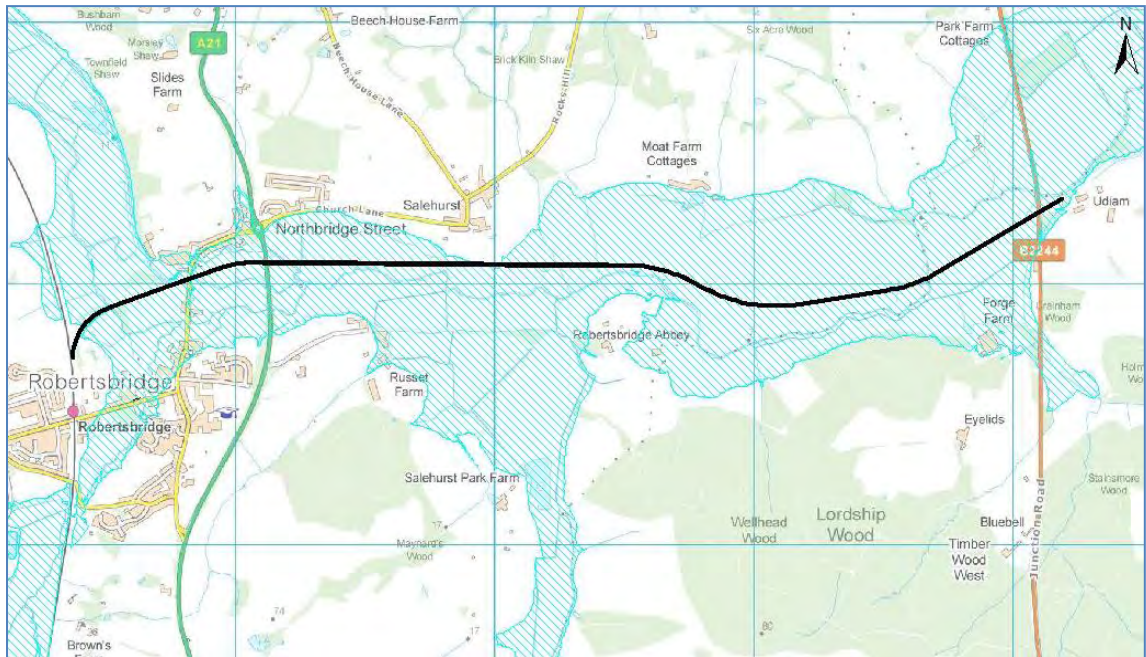


Figure 2 - Environment Agency Flood Zone 3

### 3.3 Sequential and Exception Test

- 3.3.1 The aim of the Sequential Test is to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding. Since the proposed route of the railway follows the historic route and is linking two existing sections of railway it is not possible to locate the proposed development elsewhere in a lower risk zone. Accordingly there can be “no reasonably available sites in areas with a lower probability of flooding” and the application site satisfies the Sequential Test.
- 3.3.2 The development is classified as less vulnerable and is appropriate in Flood Zone 3a. The proposed railway line does cross the functional floodplain as discussed in section 3.2. For completeness the criteria of the Exception Test have been considered. The proposed development will provide wider sustainability benefits to the community as identified in the Councils Local Plan including tourism and linking to main line services from Hastings to London. The proposed scheme will include raising defences to meet the design standard of protection originally intended for the flood alleviation scheme.
- 3.3.3 The following chapters of this report discuss the detailed flood study that has been undertaken and the proposal to manage flood risk. This site specific flood risk assessment demonstrates that the development will be safe, without increasing flood risk to property elsewhere and through improving the current defences will reduce overall flood risk to the community in Northbridge Street. It is proposed that the train line is not operated during times of flooding and that the operating company (Kent and East Sussex Railway) subscribes to the Environment Agency’s flood warning service.

## 4 Flood Probability and Hazard

### 4.1 Catchment Background

- 4.1.1 In order to assess the risk of flooding to the reinstated railway, and the wider area of Robertsbridge, it is important to understand the existing catchment characteristics and historic flow patterns.
- 4.1.2 The site is located in the Rother catchment. The River Rother flows in an easterly direction for approximately 30 km before flowing into the English Channel, at Rye (NGR TQ 95700 17400). The Darwell Stream is a tributary of the Rother that flows through Robertsbridge.

#### Local Geology

- 4.1.3 Robertsbridge lies on a succession of sandstones, siltstones and mudstones (commonly clays) of the Hastings Beds. The solid geology around Robertsbridge is Ashdown Sandstone Formation and the drift geology includes alluvium and river terrace deposits<sup>1</sup>.
- 4.1.4 The Environment Agency “Aquifer Maps – Superficial Deposits designations map” classifies the deposits as a Secondary (undifferentiated). The Aquifer Maps - bedrock designation is Secondary A. The Environment Agency groundwater vulnerability map classifies the site as Minor Aquifer High.

#### Flood History

- 4.1.5 Table 4.1 provides information on historic local flood events in the catchment based on information provided in the Rother Strategic Flood Risk Assessment (SFRA). In the SFRA the Highway Authority's Divisional Engineer has provided a schedule of the locations most prone to highway flooding in Rother District these include the Robertsbridge area.

**Table 4.1** Historic flood events at Robertsbridge

Date	Description and Source
1946, 1960, 1979, 1985, 1999, 2001	Fluvial - Insufficient storage capacity. Very intense rainfall on an already wet soil leading to rapid runoff. Recent development in the floodplains, debris in the river channel.
1993	Fluvial - Intense rainfall, properties flooded by sewage contaminated water
12 <sup>th</sup> October 2000 (greater than 1% event) 31 <sup>st</sup> October 2000 5 <sup>th</sup> November 2000	Fluvial - Very intense rainfall on an already wet soil leading to rapid runoff. Recent development in the floodplains, debris in the river channel, backing up from road drains and surcharging of combined sewerage system (indirect source), backing up behind culverts and bridges, overtopping of low flood embankment, back up of floodwater from the floodplains, reduced storage capacity due to repeat events

- 4.1.6 The East Sussex County Council Preliminary Flood Risk Assessment (PFRA) indicates groundwater flooding has occurred historically in the Robertsbridge area. The PFRA also indicates sewer flooding occurred in Northbridge Street and Station Road in Robertsbridge in 2002, 2008, and 2010. In 2010 blocked culverts and drains resulted in isolated surface water flooding.

<sup>1</sup> Harris, R.B., 2009, Robertsbridge Historic Character Assessment Report, Sussex Extensive Urban Survey.

- 4.1.7 There is an existing hydraulic model of the River Rother which has been used to assess flood risk and the impact of the proposed reinstatement of the railway. The model was developed by Hyder for the Environment Agency in 2011. While reviewing the model for use in this flood risk assessment a number of opportunities for improvements were noted. The improvements made to the model included those listed below and further details are included in the Rother Valley Railway FRA Modelling Report (December 2013):
- improvements to the 2d\_2d boundary between the middle and lower domains, where an unrealistic water surface profile was observed in the 1% AEP design event;
  - changes to the Darwell Stream and downstream of the A21 to improve model stability including changes to weir coefficients and modular limits in the spill units, changes to spill widths, improvements to floodplain Manning's n values, and changing some SX boundaries between the ISIS and TUFLOW to HX connections; and
  - amendments to the defences layer in the model which included removing a defence along The Clappers which doesn't exist, raising the defence to the north of the Museum/Bridge bungalow which was set incorrectly (100mm too low), and raising the defence to the east of The Clappers Flood Gate which was too low for approximately 10m .

## 4.2 Site Topography

- 4.2.1 Existing ground levels along the route of the proposed railway vary from 11.7 m AOD to 4.4 m AOD generally falling from the west towards the east.
- 4.2.2 The ground levels for the proposed railway will be altered along the route gradually falling from 11.53 m AOD near Northbridge Street to 5.865 m AOD to meet the existing Kent and East Sussex railway.

## 4.3 Flood Zone

- 4.3.1 Flood Zones describe the extent of flooding that would occur on the basis that no flood defences were in existence. The definition of Flood Zones is provided in Table 1 of the Technical Guidance to NPPF.
- 4.3.2 A review of the Flood Zone Mapping undertaken by the Environment Agency has identified that the site is located within Flood Zone 3a 'Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.' The site is assessed as being at high probability of flooding.

## 4.4 Existing Flood Risk Management Infrastructure

- 4.4.1 Robertsbridge and Northbridge Street both benefit from defences on the River Rother and Darwell Stream.
- 4.4.2 After the autumn 2000 floods, a major flood defence scheme was implemented in Robertsbridge, consisting of raised permanent flood walls/bunds along the river, and a number of movable gates that can be used to create temporary flood walls. This scheme was completed in 2004 (Atkins, 2007). Pumps were also added to the scheme to deal with runoff resulting from incident rainfall within the defended area which was no longer able to connect directly back into the river due to the flood defences blocking flow. These pumps facilitate removal of water from within the defended area back into the river. Pumps on the Mill Stream also convey high flows over the defences and back into the Rother.<sup>2</sup>

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<sup>2</sup> Environment Agency, 2011, River Rother Final Hydraulic Modelling, ABD, and Hazard Mapping Report, Hyder.

- 4.4.3 The defences were designed to protect the urban areas during a 1 in 100 year return period fluvial event. However, the Environment Agency model predicts that the defences around Northbridge Street could overtop in a 1 in 100 year event (1% AEP design event).
- 4.4.4 The topographical survey shows the crest level of the defences are between 12.4 m AOD (upstream) and 11.2 m AOD (downstream) at Northbridge Street, and between 12.7 m AOD and 11.5 m AOD at Robertsbridge.

## 4.5 Sources of Flooding – Actual Flood Risk

- 4.5.1 The NPPF describes potential sources of flooding. It is necessary to consider the risk of flooding from all sources within a FRA. This section provides a review of flooding from land, sewers, groundwater and artificial sources, in addition to rivers.

### **Fluvial Flood Risk**

- 4.5.2 Fluvial flooding occurs when the amount of water exceeds the flow capacity of the river channel. Most rivers have a natural floodplain into which the water spills in times of flood. The historic route of the railway is through the Rother floodplain and therefore the proposed reinstated route is also through the floodplain.
- 4.5.3 The improved Environment Agency model was edited to create a version of the model with the proposed railway embankment, bridge crossings, and flood relief culverts through the embankment. This model is referred to hereafter as 'with railway' scenario. Rother Valley Railway was keen to identify options to improve flood risk protection in the area. It was identified that the defences at Northbridge Street are predicted to overtop in the 1% AEP design event for both the baseline and 'with railway' scenarios.

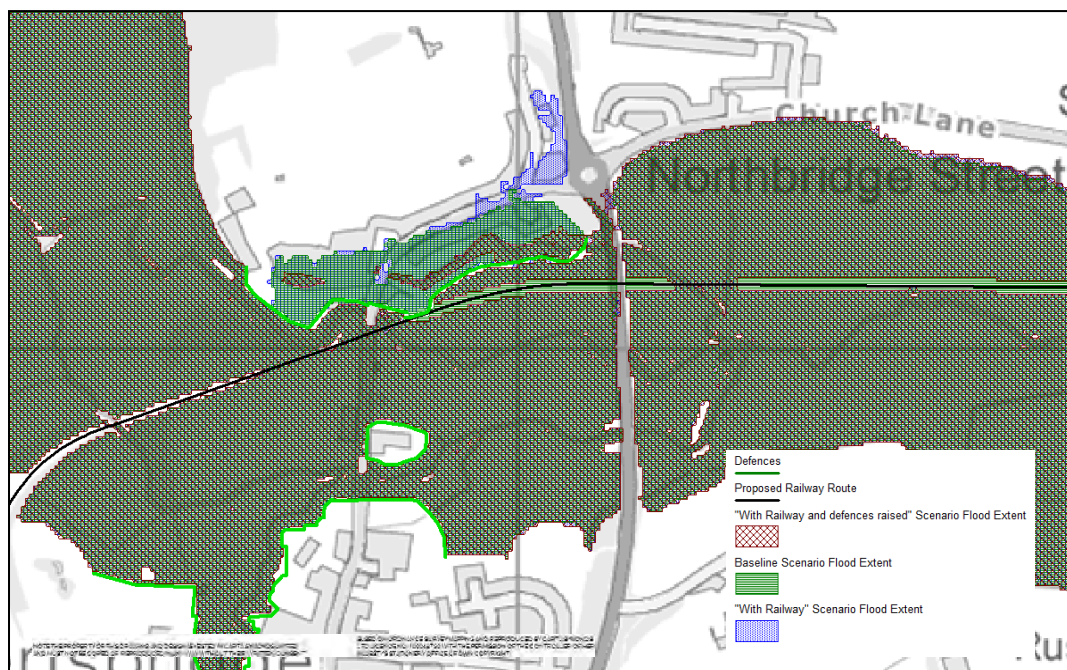


Figure 3 - 1% AEP design flood extent for the three scenarios . (Note the 'with railway' scenario flood extent is drawn below the other flood extents shown and therefore it is only visible on the map where its extent is greater than the other flood extents).

- 4.5.4 Figure 3 highlights the difference in flood extents between the current (baseline), 'with railway' and 'with railway and defences raised' scenarios for the 1% AEP design flood event. The 'with railway and defences raised' scenario includes a section of defences raised by up to 0.3 m above current defence crest levels at Northbridge Street. This 'with railway and defences raised' scenario was included to investigate the option of raising the defences to provide the 100 year design standard of protection originally intended for the flood alleviation scheme.
- 4.5.5 The majority of the railway is not at risk of flooding up to and including the 1.33% AEP (1 in 75 year) flood event. The section of the railway near Udiham between Austins Bridge and the B2244 is at risk in all the events modelled. Table 4.2 provides water levels and depths of flooding along the proposed reinstated railway for the modelled flood events. The locations referred to in the table are shown in Figure 4. The management of flood risk along the proposed railway is discussed in section 5.2.

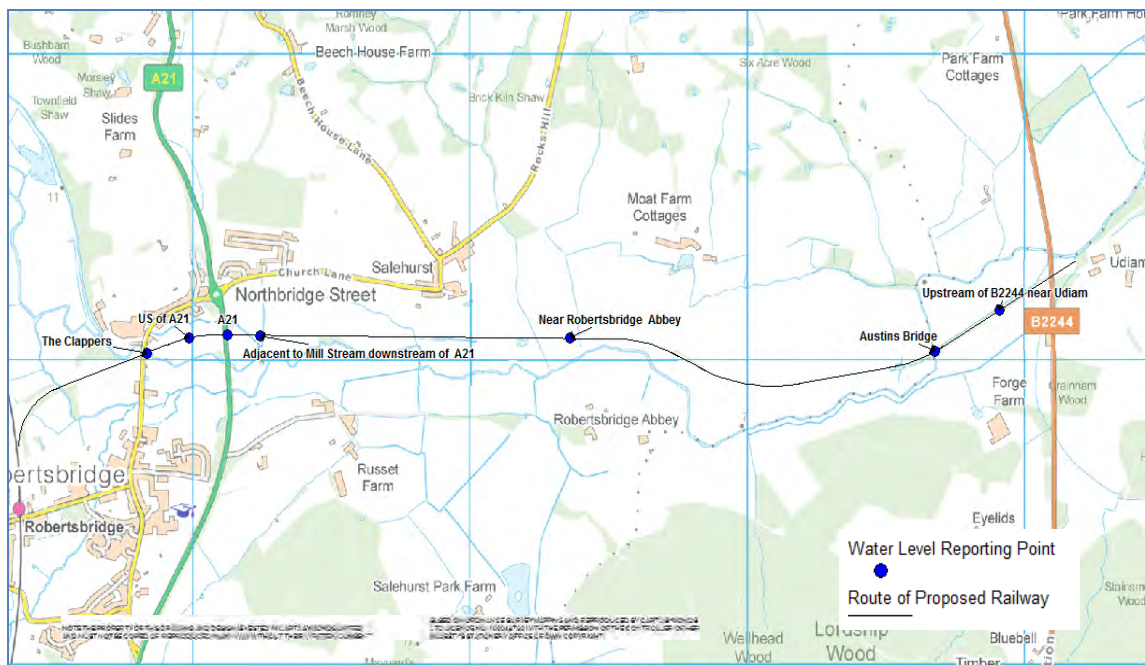


Figure 4 - The locations referred to in Table 4.2

**Table 4.2 Flood Levels along the proposed reinstated railway**

(\*the levels reported are those along the route of the railway and maybe below the railway level at river crossings and culvert/viaduct locations.)

Location Description	NGR	Design Flood Event	Railway level (m AOD)	With Railway and defences raised Flood Level (m AOD)*	Approximate depth of water on railway (m)
The Clappers road bridge	TQ7382524020	5% AEP	11.53	NA	NA
		2% AEP		11.37	NA
		1.33% AEP		11.50	NA
		1% AEP		11.60	0.07
		1% +CC AEP		11.82	0.29

Location Description	NGR	Design Flood Event	Railway level (m AOD)	With Railway and defences raised Flood Level (m AOD)*	Approximate depth of water on railway (m)
Upstream of A21	TQ7397724069	5% AEP	11.525	NA	NA
		2% AEP		NA	NA
		1.33% AEP		NA	NA
		1% AEP		NA	NA
		1% +CC AEP		11.62	0.09
A21 road bridge	TQ7411724079	5% AEP	11.385	NA	NA
		2% AEP		NA	NA
		1.33% AEP		NA	NA
		1% AEP		NA	NA
		1% +CC AEP		11.56	0.17
Adjacent to Mill Stream downstream of A21	TQ7423724078	5% AEP	11.16	9.53	NA
		2% AEP		9.73	NA
		1.33% AEP		9.83	NA
		1% AEP		9.91	NA
		1% +CC AEP		10.12	NA
Near Robertsbridge Abbey	TQ7535724069	5% AEP	8.92	7.84	NA
		2% AEP		7.99	NA
		1.33% AEP		8.07	NA
		1% AEP		8.12	NA
		1% +CC AEP		8.24	NA
Austins Bridge	TQ7667624026	5% AEP	6.55	6.38	NA
		2% AEP		6.51	NA
		1.33% AEP		6.58	0.03
		1% AEP		6.63	0.08
		1% +CC AEP		6.74	0.19
Upstream of B2244 near Udiam	TQ7690924161	5% AEP	5.4	6.08	0.68
		2% AEP		6.28	0.88
		1.33% AEP		6.38	0.98
		1% AEP		6.45	1.05
		1% +CC AEP		6.58	1.18

Note: 5% AEP (Annual Exceedance Probability) = 20 year Flood Event; 2% AEP = 50 year Flood Event; 1.33% AEP = 75 year Flood Event; 1% AEP = 100year Flood Event; and 1% +CC AEP = 100 year with climate change Flood Event)

- 4.5.6 The water levels in the baseline, 'with railway' and the 'with railway and raised defences' scenarios at key locations are listed in Table 4.3. The model nodes and locations around Robertsbridge referred to in the table are shown in Figure 5. The 'with railway' scenario is included in the reporting to demonstrate the benefit of raising defences at Northbridge Street (which is included in the 'with railway and defences raised' scenario). Flood extent figures for all design flood events are provided in Appendix A of the modelling report.

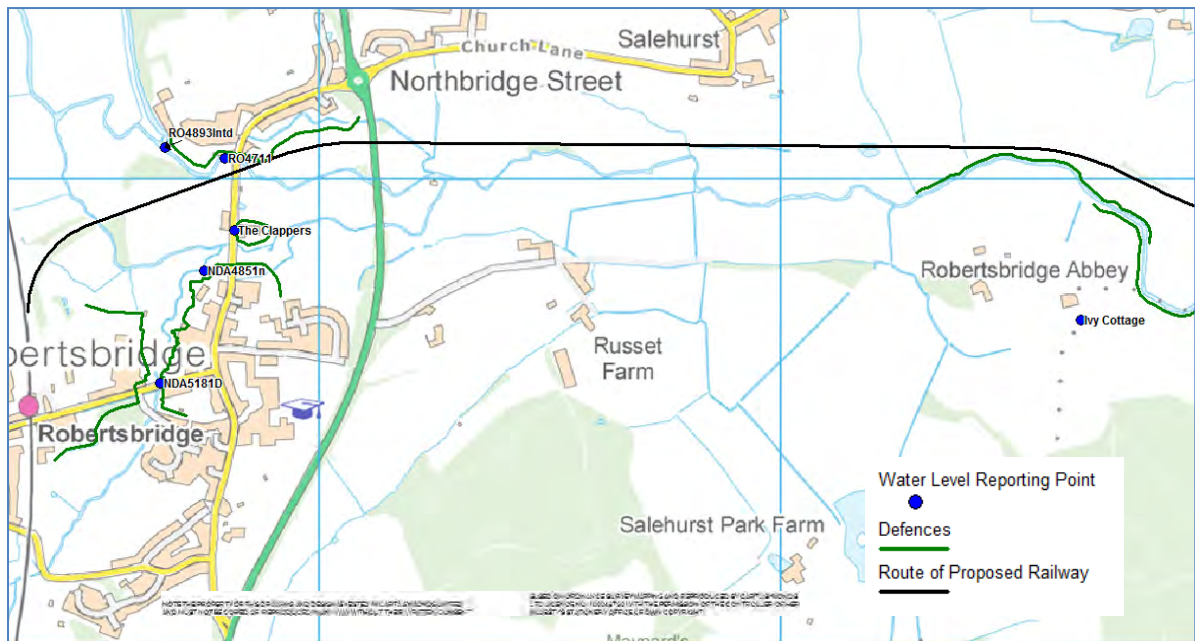


Figure 5 - The locations referred to in Table 4.3

Table 4.3 Flood Levels

Node/ location	Event	Defence level (m AOD)	Baseline Flood Level (m AOD)	With Railway Flood Level (m AOD)	With Railway and defences raised Flood Level (m AOD)	Difference in flood level between baseline and with railway & defences (cm)
RO4893Intd Upstream of Northbridge Street	5%	12.4	11.51	11.52	11.52	Approx. 1cm
	2% AEP		12.04	12.04	12.04	<1cm -
	1.33% AEP		12.24	12.25	12.25	Approx. 1cm
	1% AEP		12.35	12.37	12.38	Approx. 3cm
	1% AEP + CC		12.56	12.57	12.60	Approx. 4cm
R04711 Northbridge Street (west of road)	5%	12 (raised to 12.3)	11.35	11.38	11.38	Approx 3cm
	2% AEP		11.86	11.87	11.87	Approx. 1cm
	1.33% AEP		12.03	12.05	12.06	Approx. 3cm
	1% AEP		12.12	12.16	12.19	Approx. 7cm
	1% AEP + CC		12.29	12.31	12.38	Approx. 9cm
The Clappers upstream of Bridge	5%	12.1	NA	NA	NA	NA
	2% AEP		11.81	11.81	11.81	<1cm

Bungalow/Museum	1.33% AEP		11.96	11.98	11.99	Approx. 3cm
	1% AEP		12.05	12.07	12.10	Approx. 5cm
	1% AEP + CC		12.19	12.21	12.25	Approx. 6cm
NDA4851n - North of Robertsbridge	5%	12.2 (raised to 12.3)	11.24	11.25	11.25	< 1cm
	2% AEP		11.77	11.77	11.77	< 1cm
	1.33% AEP		11.92	11.94	11.94	Approx. 2cm
	1% AEP		12.00	12.02	12.04	Approx. 4cm
	1% AEP + CC		12.14	12.15	12.19	Approx. 5cm
NDA5181D – Station Road Robertsbridge	5%	12.2 (raised to 12.3)	11.30	11.31	11.31	< 1cm
	2% AEP		11.83	11.84	11.84	Approx. 1cm
	1.33% AEP		11.99	12.00	12.00	Approx. 1cm
	1% AEP		12.08	12.10	12.12	Approx. 4cm
	1% AEP + CC		12.24	12.25	12.29	Approx. 5cm
Ivy Cottage, near Robertsbridge Abbey	5%	NA	7.19	7.01	7.01	Approx. 18 cm reduction
	2% AEP		7.36	7.33	7.33	Approx. 3 cm reduction
	1.33% AEP		7.40	7.39	7.39	Approx. 1 cm reduction
	1% AEP		7.42	7.42	7.42	-
	1% AEP + CC		7.50	7.52	7.52	Approx. 2 cm

- 4.5.7 The extent of flooding in the **5% AEP (20 year) design event** is similar in the 'with railway and defences raised' to the baseline scenario with no additional properties in the flood extent (Figure 6). The defences are not overtopped. Water levels at the industrial/business units on Station Road, Robertsbridge (that do not benefit from the defences) are less than 0.01 m different in the 'with railway and defences raised' compared to the baseline scenario. Threshold survey has been undertaken at the two properties on Station road that do not benefit from the defences. These are Grey Nicholls and the Sussex Cattle Society. No private defences were identified at these properties. The frequency of internal flooding is unlikely to change because flood levels are well above the threshold in both the baseline (current) and 'with railway and raised defences' scenarios. Water levels in both scenarios are between 0.2 and 0.5 m above the surveyed threshold (threshold, damp proof course and windowsill levels) of the two properties. The difference in flood levels across the floodplain between the baseline and 'with railway and defences raised' scenario are generally within 0.07m. There are some areas of the floodplain where the difference in water levels is greater for example in the Robertsbridge Abbey area predicted water levels are approximately 0.18 m lower in the 'with railway and defences raised' scenario. The model has demonstrated that at lower return periods (more frequent events) the railway does not increase the frequency of flooding to properties.

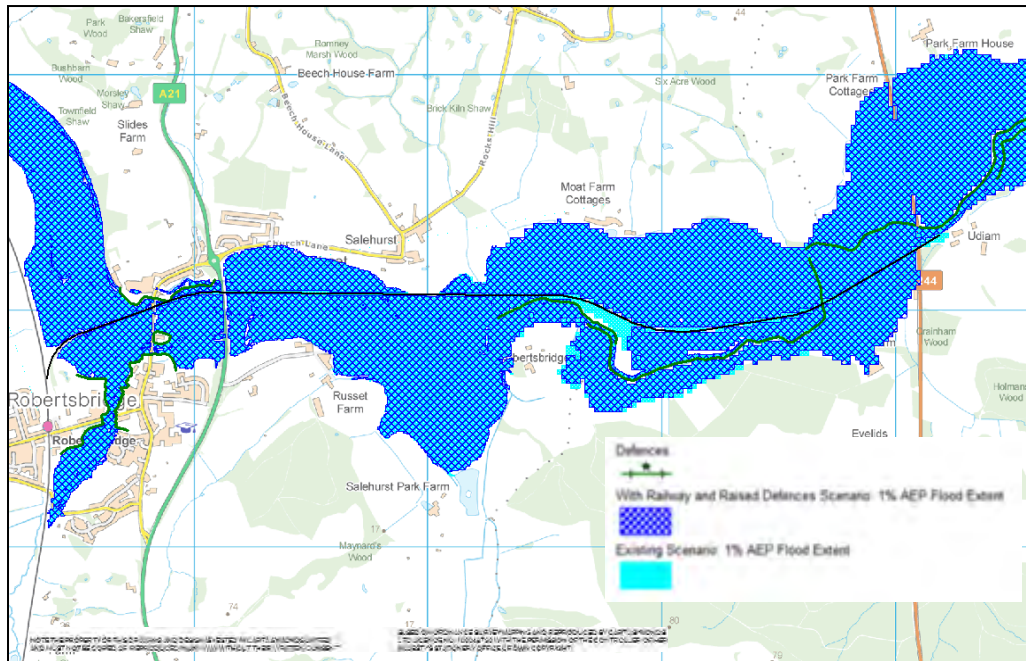


Figure 6 – 5% AEP design event Flood Extents

- 4.5.8 The extent of flooding in the **2% AEP (50 year) design event** is similar in the 'with railway and defences raised' to the baseline scenario with no additional properties in the flood extent. The defences are not overtopped. Water levels at the industrial/business units on Station Road, Robertsbridge (that do not benefit from the defences) are less than 0.01 m different in the 'with railway and defences raised' compared to the baseline scenario. The predicted flood levels are 0.6 m above the threshold of the properties in the baseline and 'with railway and raised defences' scenarios. Flood levels in the Robertsbridge Abbey area are approximately 0.03 m lower in the 'with railway' scenario.
- 4.5.9 The extent of flooding in the **1.33% AEP (75 year) design event** is slightly larger in Northbridge Street in the baseline scenario compared to the 'with railway and defences raised' scenario. The defences are overtopped in the baseline and 'with railway' scenario, although flooding is limited to the Mill site west of The Clappers/Northbridge Street. In the 'with railway and defences raised' scenario there is no overtopping of the defences. Water levels at the industrial/business units on Station Road, Robertsbridge (that do not benefit from the defences) are approximately 0.01 m higher in the 'with railway' scenario compared to the baseline scenario. The predicted flood levels are above the threshold of the properties in the baseline and 'with railway and raised defences' scenarios. Flood levels in the Robertsbridge Abbey area are approximately 0.01 m lower in the 'with railway' scenario.
- 4.5.10 The extent of flooding in the **1% AEP (100 year) design event** is slightly larger in the 'with railway' scenario compared to the baseline scenario particularly in Northbridge Street. The defences at Northbridge Street are overtopped in the baseline and 'with railway' scenario. A greater number of properties are affected in the 'with railway' scenario. However in the 'with railway and defences raised' scenario there is no overtopping of the defences (Figure 3). Water levels at the industrial/business units on Station Road, Robertsbridge (that do not benefit from the defences) are approximately 0.03 m higher in the 'with railway and raised defences' scenario compared to the baseline scenario. Threshold survey indicates that the 1% AEP flood levels at industrial/business units on Station Road, Robertsbridge are more than 0.87 m above the threshold of the properties in all three scenarios. The defences at the Bridge Bungalow/Museum are not overtopped but water levels are only a few centimetres below the defence crest (12.1 m AOD) in all scenarios. Flood levels in the Robertsbridge Abbey area are the same in the baseline and 'with railway and raised defences' scenarios.

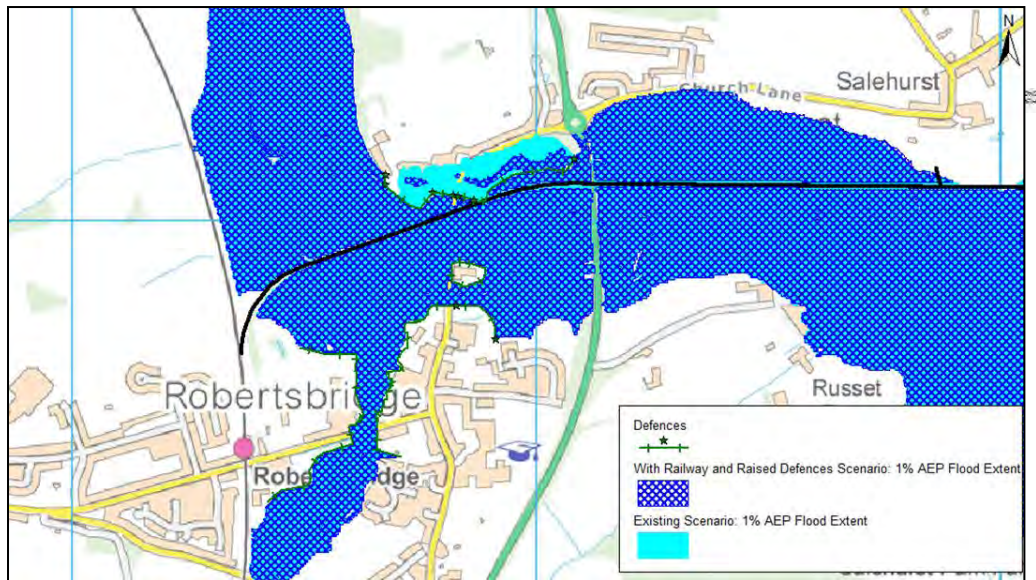


Figure 7 – 1% AEP design event Flood Extents

4.5.11 Figure 7 indicates the flood extents for the existing baseline scenario and the 'with railway and raised flood defence scenario' and demonstrates that the extent of flooding is not increased in the 1% AEP scenario and the properties in Northbridge Street benefit from a reduction in flood risk. It is proposed that the defences west of The Clappers/Northbridge Street are raised. However the modelling demonstrates there is no requirement to raise the demountable flood gate across The Clappers/Northbridge Street or the defences east of the road. A small amount of flooding is indicated by the modelling along the Mill Stream in Northbridge Street in the 'with railway and defences raised' scenario. Figure 8 illustrates the reduction in predicted water levels behind the Northbridge Street defences in the 'with railway and defences raised' scenario. For example the flood extent is significantly reduced in Rutley Close, with only a small extent of flooding predicted in back gardens adjacent to the watercourse. Flood levels here are approximately 1.7 m lower in the 'with railway and defences raised' scenario compared to the baseline (existing) scenario.

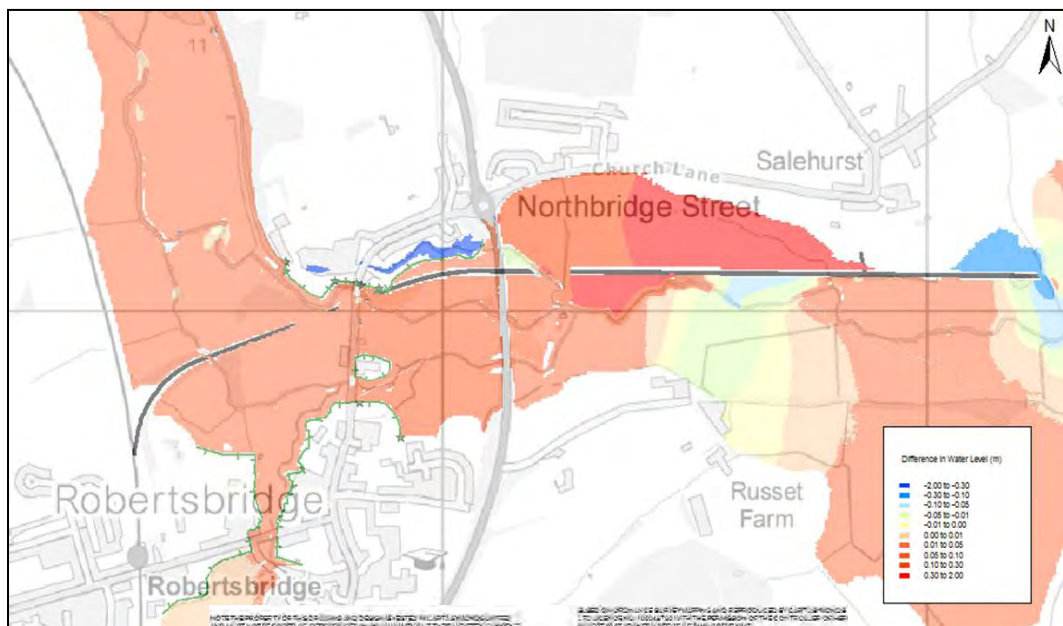


Figure 8 – Difference in water level (1% AEP design event) between the baseline and 'with railway and raised defences' scenarios.

4.5.12 The extent of flooding in the **1% AEP (100 year) with climate change design event** is slightly larger in the 'with railway' scenario compared to the baseline scenario particularly in Robertsbridge. The defences at Northbridge Street and Robertsbridge are overtopped in the baseline and 'with railway' scenario. In the 'with railway and defences raised' scenario sections of defences around Robertsbridge are raised so that no additional properties are added to those within the baseline flood extent. Figure 9 shows the flood extents for all three scenarios and demonstrates that the raising of defences reduces flood risk in the 1% AEP with climate change scenario. Comparisons of water levels in the 'with railway and defences raised' scenario at key locations include:

- Water levels at properties in Northbridge Street are 0.04 m lower than in the baseline and 'with railway' scenarios.
- The defences at the Bridge Bungalow/Museum are overtopped in all scenarios and water levels are approximately 0.06 m higher in the 'with railway and raised defences' scenario compared to the baseline scenario. The flood depth in the baseline scenario is approximately 1.2 m. Flood levels in all three scenarios are above the property threshold level. Therefore the risk of flooding to the property is not increased in the 'with railway and raised defences'.
- Water levels at the industrial/business units on Station Road, Robertsbridge (that do not benefit from the defences) are approximately 0.04 m higher in the 'with railway and raised defences' scenario compared to the baseline scenario. However the water levels are approximately 1 m above the property threshold levels in all scenarios. Therefore the risk of flooding to the property is not increased in the 'with railway and raised defences' scenario.
- Flood levels at Robertsbridge Abbey (Ivy Cottage) are approximately 0.02 m higher in the 'with railway and raised defences' scenario compared to the baseline scenario.

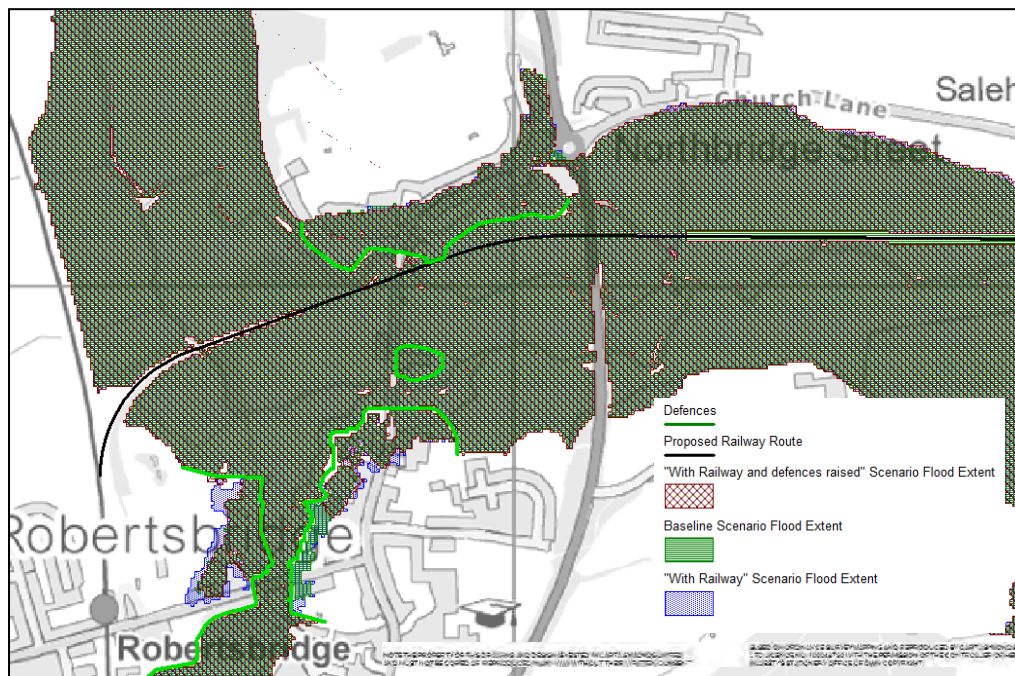


Figure 9 –1% AEP with climate change design event for all three scenarios. (Note the 'with railway' scenario flood extent is drawn below the other flood extents shown and therefore it is only visible on the map where its extent is greater than the other flood extents).

4.5.13 Model simulations were undertaken to identify where defences need to be raised to provide the 1 in 100 year protection the scheme was designed to deliver. The model simulations identified that defences need to be raised to the west of Northbridge Street between TQ 73820 24053 and TQ 73673 24079. We propose the defences are raised from 12 m AOD to 12.3 m AOD and then

gradually increase to the existing level of 12.4 m AOD at the upstream extent of the defences. Figure 10 shows where the defence should be raised to provide the 1 in 100 year standard of protection.

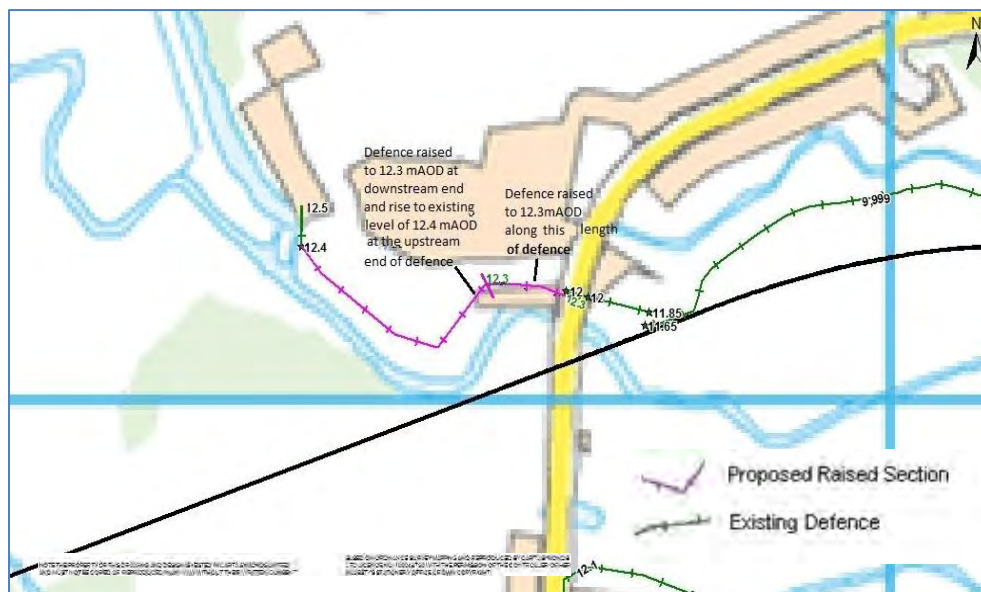


Figure 10 - The locations at Northbridge Street where the raising the defences is proposed

4.5.14 Model simulations were also undertaken to identify where defences need to be raised around Robertsbridge to maintain or reduce the level of flood risk to property in the 1% AEP with climate change flood event. The model simulations identified that defences shown in pink in Figure 11 need to be raised by a minimum of 100mm. The defences to the east of The Clappers requires raising by 400mm. There is no requirement to raise the demountable flood gates. The required freeboard above the 1% AEP with climate change design flood levels along the defences should be agreed with the Environment Agency.

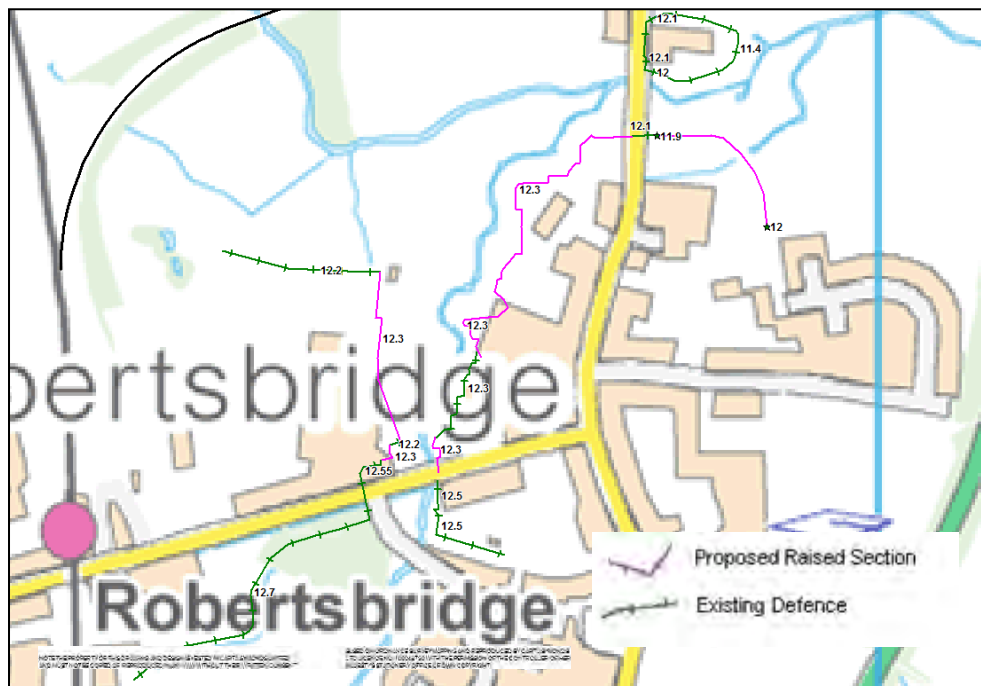


Figure 11 - The locations at Robertsbridge where the raising the defences is proposed

***Tidal Flood Risk***

4.5.15 There is no risk of tidal flooding at the site.

***Flood Risk from Land, Surface Water and Sewers***

4.5.16 Flooding from land can be caused by rainfall being unable to infiltrate into the natural ground or entering the drainage systems due to blockage, or flows being above design capacity. This can then result in (temporary) localised ponding and flooding. The natural topography and location of buildings/structures can influence the direction and depth of water flowing off impermeable and permeable surfaces.

4.5.17 The proposed railway is considered at low risk of surface water/sewer flooding. The track is generally higher than the surrounding ground and water is considered unlikely to pond on the tracks in significant volumes. The railway line will be built on a permeable base with no significant change in surface water runoff.

4.5.18 The culverts and sections of viaduct included in the proposals to maintain connectivity across the floodplain will also act as flow paths for surface water. The areas immediately upstream of the proposed railway embankment are farmland/open spaces where local ponding of surface water adjacent to the railway embankment will not increase the risk of flooding to property.

***Groundwater Flood Risk***

4.5.19 Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in low-lying areas underlain by permeable rocks.

4.5.20 The proposed railway is considered at low risk of groundwater flooding. The proposed route is generally higher than the surrounding ground.

***Flood Risk from Artificial Sources***

4.5.21 Artificial sources of flooding include reservoirs, canals, lakes and mining abstraction.

4.5.22 The Darwell Reservoir is the closest artificial water features to the site. Wadhurst Park lake is the second closest large artificial water feature. The Environment Agency risk of flooding from reservoirs map indicates that both these reservoirs could affect the Robertsbridge area if they were to fail and release the water they hold. The maps show the largest area that might be flooded in the worst case scenario and it is unlikely that any actual flood would be this large. The Darwell Reservoir is approximately 4 km from the proposed railway. There is no information within the SFRA to indicate that flooding from artificial water bodies is considered a significant flood risk to the site.

4.5.23 Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency ensures that reservoirs are inspected regularly and essential safety work is carried out.

4.5.24 The risk from artificial sources is considered low to medium.

## 5 Flood Risk Management

### 5.1 Principles of Flood Risk Management

- 5.1.1 NPPF requires a precautionary approach to be undertaken when making land use planning decisions regarding flood risk. This is partly due to the considerable uncertainty surrounding flooding mechanisms and how flooding may respond to climate change. It is also due to the potentially devastating consequences of flooding to the people and property affected.
- 5.1.2 Flood risk is a combination of the probability of flooding and the consequences of flooding. Hence 'managing flood risk' involves managing either, the probability of flooding or the consequences of flooding, or both.
- 5.1.3 NPPF requires flooding from tidal, fluvial, land, surface water & sewerage and from groundwater to be considered. The flood risk management measures discussed in this section are based on the sources of flooding identified in Section 4 that are considered to pose an unacceptable risk to the development proposals.

### 5.2 Flood Risk Management along the Rother Valley Railway

- 5.2.1 Section 4 identified the following sources of flooding that require management to reduce risk to an acceptable level in compliance with NPPF:
  - Fluvial sources along the route of the railway;
  - Fluvial flood risk to properties in Robertsbridge and Northbridge Street; and
  - Residual risk of flooding from reservoirs.

### 5.3 Management of Fluvial Flood Risk along the Railway

- 5.3.1 The flood risk to the railway will be managed through restricting operation of the railway during times of severe flood. If there is a risk of flooding to the railway line it is proposed that services along the railway between Bodiam and Robertsbridge are cancelled.
- 5.3.2 The culverts and bridge crossing proposed reduce the increase in floodplain water levels and maintain connectivity across the current floodplain.

### 5.4 Management of Fluvial Flood Risk to Robertsbridge and Northbridge Street

- 5.4.1 The Environment Agency model predicts that the existing defences to the west of Northbridge Street do not provide the 1 in 100 year protection anticipated when the defences were built. In addition to this the water levels predicted for the 1% AEP (100 year) design event are within 0.1 m of the crest of some of the defences around Robertsbridge. The proposed raised railway line will displace flood waters increasing flood levels around Robertsbridge by approximately 0.01 to 0.05 m. However the defences around Robertsbridge are not predicted to overtop except in the 1% AEP design event with climate change (they also overtop in the baseline scenario for this design flood event).

- 5.4.2 The opportunity to improve the benefit afforded by the defences to properties in Northbridge Street and Robertsbridge is being embraced by the Rother Valley Railway. The proposal is to raise a section of the defences by up to 0.3 m to alleviate the increase in predicted water levels at properties in Northbridge Street caused by the reinstated railway embankment and to improve the protection to properties in the 1% AEP (100 year) event. It is also proposed to raise defences around Robertsbridge so that flood risk is reduced or maintained at the currently predicted levels for the 1% AEP with climate change design flood event.
- 5.4.3 Flood risk is also managed through a number of flood relief culverts under the railway embankment that enable water to flow across the floodplain at key locations.

## 5.5 Management of Residual Risk of flooding from reservoirs

- 5.5.1 To manage residual risk of flooding from reservoirs it is recommended that the train operator contact East Sussex County Council and the reservoirs owners to review the procedures in the emergency plan and the processes proposed within the off-site reservoir management plan. From this review the train operator should understand what they can do in the event of flooding and/or have their name added to a contact list so that they are warned of an impending breach of the reservoir.

## 5.6 The Environment Flood Warning and Evacuation plan

- 5.6.1 The Environment Agency operates a Flood Warnings Direct service; the Robertsbridge Flood Warning area covers part of the route of the railway between Robertsbridge and Udiam and therefore if deemed appropriate, it is recommended the train operator (Kent and East Sussex Railway) subscribe to this service. It is proposed that train operator (Kent and East Sussex Railway) cancel services between Bodiam and Robertsbridge in the event of a Flood Warning or Severe Flood Warning. A Flood Alert should be the trigger for reviewing services and consulting with the Environment Agency on the expected flood levels.

## 6 Conclusion

- 6.1.1 Capita were commissioned by Rother Valley Railway Limited to undertake a Flood Risk Assessment (FRA) for the proposed reinstatement of the Rother Valley Railway between Robertsbridge and Udiam (NGR TQ 73807 24014 to TQ 77186 24322). The route is approximately 3.5 km and will link the existing railway between Bodiam and Robertsbridge. The route is located within Flood Zone 3 on the Environment Agency Flood Zone Map and is identified by Council as being an acceptable development if flood risk is managed. The proposed scheme includes reinstating the raised embankment and bridges.
- 6.1.2 Risk from flooding to the public associated with the operation of the railway will be managed through restricting operation during times of severe flood. If there is a risk of flooding to the railway line it is proposed that services along the railway between Bodiam and Robertsbridge are cancelled.
- 6.1.3 The opportunity to improve the benefit afforded by the defences to properties around Robertsbridge is fully supported by the Rother Valley Railway. The proposal is to raise the defences as detailed in paragraph 4.5.14, Figure 10 and Figure 11, to take account of the 1 in 100 year event plus climate change scenario.
- 6.1.4 The development proposal has considered flood risk at all stages throughout the development of the final layout and reflects the flood risk constraints and the need to manage, and where possible reduce, flood risk in compliance with the guidance in the NPPF. This FRA demonstrates that the flood risk related to the proposed reinstatement of the railway can be adequately managed and will improve the defences at Northbridge Street and Robertsbridge.

## Appendix A - Additional Policies

### A.1 Policy DS1

#### **POLICY DS1**

**In determining whether development is appropriate in a particular location, proposals should accord with the following principles:**

1. priority is given to making best use of urban land, especially through the re-use of previously developed land/buildings;
2. it fosters sustainable and socially inclusive communities, including by supporting local services and helping meet local needs, such as for affordable housing;
3. it ensures a sufficient continuing supply of employment sites and premises to foster economic regeneration;
4. it ensures a good level of accessibility to a range of services and jobs by public transport, recognising that opportunities are more limited in rural areas;
5. best use is made of existing infrastructure, including transport, community facilities and mains drainage;
6. it avoids prejudicing the character and qualities of the environment, particularly the High Weald Area of Outstanding Natural Beauty and undeveloped coastline;
7. it protects sites of recognised nature conservation importance, particularly of internationally and nationally important sites, as defined on the Proposals Map;
8. it protects historic parks and gardens and Battle battlefield, as defined on the Proposals Map;
9. it respects the importance of the countryside in terms of its distinct landscape character, natural resources, woodland and agriculture;
10. it protects ancient woodland from development that would prejudice its ecological and landscape value;
11. it ensures that development is safe from flooding, including by restricting development in flood risk areas and not increasing such risk elsewhere;
12. it protects vulnerable countryside gaps between settlements, as elaborated upon by Policy DS5.
13. it ensures a sufficient continuing supply of housing land in accordance with the Structure Plan housing supply requirement and the spatial strategy of the Plan'
14. it avoids development on unstable land except where the proposal demonstrates that actual or potential instability can reasonably be overcome.

### A.2 Policy GD1

#### **POLICY GD1**

**All development should meet the following criteria:**

1. it meets the needs of future occupiers, including providing appropriate amenities and the provision of appropriate means of access for disabled users;
2. it is in keeping with and does not unreasonably harm the amenities of adjoining properties;

3. it provides for adequate and safe access by all relevant modes of transport, appropriate parking provision, in accordance with Policy TR3 and does not result in unacceptable traffic or transport conditions;
4. it respects and does not detract from the character and appearance of the locality;
5. it is compatible with the conservation of the natural beauty of the High Weald Area of Outstanding Natural Beauty;
6. it respects the topography, important views to and from the site and retains site features that contribute to the character or amenities of the area;
7. it protects habitats of ecological value and incorporates, wherever practicable, features that enhance the ecological value of the site, with particular regard to wildlife refuges or corridors, or fully compensates for any necessary loss;
8. it does not prejudice the character, appearance or setting of heritage features, notably scheduled ancient monuments and sites of archaeological importance, listed buildings, conservation areas, registered historic parks and gardens, the registered battlefield at Battle, or other buildings and spaces of historic importance;
9. the infrastructure and facilities necessary to serve the development are available, or suitable provision is made as part of the development, in accordance with Policy GD2;
10. it provides adequate and appropriate means for foul and surface water drainage, with suitable alleviation and mitigation measures where necessary and does not prejudice water quality;
11. it is compatible with deterring crime, including maximising opportunities for natural surveillance of public places;
12. it promotes the efficient use of energy and water through the layout and design of buildings.
13. it properly addresses any known or suspected contamination of the site, or threat from landfill gas, through site investigations and suitable remediation;
14. where significant development of agricultural land is unavoidable, it makes use of poorer quality land (grade 3b, 4 and 5) in preference to that of higher quality except where this would be inconsistent with other sustainability considerations;
15. it takes account of flood risk and in the areas of flood risk, as shown on the Proposals Map, it is expected to minimise and manage the risk to flooding

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## **5) Water Framework Directive**

# Report

15 April 2014



# TEMPLE

LEADERS IN ENVIRONMENT,  
PLANNING & SUSTAINABILITY.

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## **Rother Valley Railway Limited**

Environmental Statement – Volume 3, Report 5

Water Framework Directive Screening Assessment Technical Report

Final



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## Contents

1.	Introduction	2
1.1.	Purpose of the Report	2
1.2.	Background	3
1.3.	Good Status	4
1.4.	Artificial or Heavily Modified Bodies	4
1.5.	Prevention Deterioration in Status and Exceptions	5
1.6.	Assessment Methodology	5
2.	Rother Valley Railway Scheme	7
2.1.	Location	7
2.2.	Scheme Overview	7
2.3.	River Crossings	8
2.4.	River Diversions	12
2.5.	Surface Water Runoff	12
3.	Impacted Waterbodies	13
3.1.	South East River Basin Management Plan	13
3.2.	Surface Water Body: Rother River	13
3.3.	Groundwater Body: Kent Weald Eastern-Rother	14
4.	Assessment Methodology	16
4.1.	Initial Data Collection	16
4.2.	Preliminary Assessment Methodology	16
4.3.	Detailed Assessment Methodology	16
5.	Preliminary assessment	18
5.1.	Impact on Biological Elements	18
5.2.	Impact on Supporting Elements	19
5.3.	Impact on Chemical Status	19
5.4.	Off-site Impacts	19
5.5.	Impact on Groundwater Bodies	20
5.6.	Temporary Works	20
5.7.	Screening Assessment Summary	21
6.	Recommendations for detailed assessment	22
6.1.	Overview	22

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6.2.Ecological Status: Biological Quality Elements	22
6.3.Embankments	22
6.4.River Crossings	22
6.5.Culverts	23
6.6.River Diversions	23
6.7.Ecological Status: Physico-Chemical Elements	24
6.8.Ecological Status: Hydro-morphology Quality Elements	24
6.9.Embankments	24
6.10.River Crossings	24
6.11.Culverts	25
6.12.River Realignments and Diversions	25
6.13.Groundwater Impacts	26
6.14.Contaminated Land	26
6.15.Objective Assessment	26
7. Conclusions	28

## **Appendices**

APPENDIX 1 Baseline Data	29
APPENDIX 2 Drawings	31
APPENDIX 3 Glossary	33

## Summary

- Any scheme, which has the potential to significantly impact upon a surface or groundwater body, should undertake a Water Framework Directive Assessment.
- For surface water bodies, consideration must be given to the impact of the scheme on riverine ecology, water quality and hydro-morphology. For groundwater bodies, consideration must be given to the body itself and to any linked surface water bodies or ecosystems it may support.
- Several components of the Rother Valley Railway have the potential to impact upon the River Rother.
- There is potential for a number of impacts on fish, invertebrates, diatoms and macrophytes as a result of the proposed scheme, either directly, or indirectly via effects on water quality and hydro-morphology.
- This report evaluates the proposed scheme to date. This assessment scopes out aspects of the scheme for compliance under the WFD and makes recommendations for sensitive design and mitigation.
- A full detailed assessment should be undertaken at detailed design stage in order to assess the impact of specific scheme elements on ecological status of the River Rother and the Kent Weald Eastern-Rother groundwater body via connected surface water wetland.
- All permanent impacts should be mitigated by best practice design, and construction of embankments, bridges and river diversions must be based on robust baseline data. All construction impacts will be mitigated by best practice methods.
- More conclusive testing and further assessment is required to determine if there is potential for contaminated land within the old railway embankment and a subsequent associated risk to the River Rother or Kent Wealds Eastern-Rother groundwater body.

# 1. Introduction

## 1.1. Purpose of the Report

- 1.1.1. The Water Framework Directive (WFD) was produced by the European Union Parliament in 2000, and is the most substantial piece of EU water legislation to date. All activities, which interact with the water environment, must take the Directive into consideration.
- 1.1.2. Any schemes or development that have the potential to significantly impact any surface or groundwater body, should undertake a Water Framework Directive Assessment to determine the effects of the proposed scheme. Considerations must be given to the effects on ecological quality, chemical quality and hydro-morphology. The assessment must identify any potential impacts, which could cause deterioration in the status of the water body, or connected water bodies, or could hinder the water body from reaching its Water Framework Directive objectives.
- 1.1.3. The proposed Scheme would reinstate approximately 3.4km of the former Kent and East Sussex Railway between the B2244 Junction Road in the east, near Udiam and Northbridge Street in Robertsbridge to the west. The proposed scheme will cross the River Rother and associated agricultural land drains in several locations and therefore has the potential to cause a significant impact of the River Rother. This assessment considers the potential effects of the preferred scheme on the WFD objectives and will be submitted as part of the Environmental Impact Assessment.
- 1.1.4. A Water Framework Directive Assessment should<sup>1</sup>:
- Include any component of the scheme which interact with or pose a risk to a water body, and provide a description of the specific scheme component being assessed for 'potential impacts';
  - Identify all potentially impacted water bodies (surface and sub-surface) and provide baseline information;
  - Assess the impact of each scheme component on the relevant water body, with regard to the objectives in the Water Framework Directive;
  - If the assessment identifies components which are not compliant with the WFD objectives, mitigation must be detailed; and
  - Finally, if the assessment concludes that any aspect of the proposed scheme causes deterioration, or prevents a WFD status being reached, the scheme should be reviewed.

<sup>1</sup> Based on Northern Ireland Environment Agency (NIEA) Water Management Unit Guidance Note, 'Carrying Out a Water Framework Directive (WFD) Assessment on EIA Developments', March 2012

- 1.1.5. This Water Framework Directive Screening Assessment and Evaluation Report has been prepared in support of the Ecology and Nature Conservation and Water, Hydrology and Hydrogeology assessments, and should be read in conjunction with these two components of the Environmental Statement (Volume 2, Chapters 9 and 10) in particular. A Construction Environmental Management Plan (CEMP) is included in the Environmental Statement (Volume 3) as Appendix 4.

## **1.2. Background**

- 1.2.1. The EU Water Framework Directive was introduced as law in England and Wales by the Water Environment (Water Framework Directive) Regulations 2003. It provides an opportunity to plan and deliver a better water environment, focussing on ecology.
- 1.2.2. The aim of the Directive is to protect and enhance the quality of freshwater surface bodies (including lakes, streams and rivers), groundwater, groundwater dependent ecosystems, estuaries and coastal waters.
- 1.2.3. Member states must aim to reach good chemical and ecological status in inland and coastal waters by 2015. The directive defines 'good ecological and chemical statuses in terms of low levels of chemical pollution as well as a healthy ecosystem.
- 1.2.4. This requires a management plan for each river basin to be developed every 6 years. In December 2009, the Environment Agency (EA) published the first set of River Basin Management Plans (RBMP) for England and Wales, including a RBMP for the Rother Catchment. The EA are the 'competent authority' responsible for implementation of the WFD
- 1.2.5. The Water Framework Directive (WFD) sets a number of different objectives. In summary, the environmental objectives for surface waters are<sup>2</sup>:
- Prevent deterioration in status of water bodies;
  - Aim to achieve good ecological and good surface water chemical status in water bodies by 2015;
  - For water bodies that are designated as artificial or heavily modified, aim to achieve good ecological potential by 2015;
  - Comply with objectives and standards for protected areas where relevant; and
  - Reduce pollution from priority substances and cease discharges, emissions and losses of priority hazardous substances.
- 1.2.6. The environmental objectives for groundwater are:
- Prevent deterioration in status of groundwater bodies;
  - Aim to achieve good quantitative and good groundwater chemical status by 2015 in all those bodies currently at poor status;
  - Implement actions to reverse any significant and sustained upward trend in pollutant concentrations in groundwater;
  - Comply with the objectives and standards for protected areas where relevant; and
  - Prevent or limit the input of pollutants into groundwater.

<sup>2</sup> Environment Agency, Annex B South East River Basin District, December 2009

### **1.3. Good Status**

- 1.3.1. The Directive sets a target of achieving ‘good status’ or above in all water bodies initially by 2015. Justification must be provided for any water body which cannot achieve good status by this date, and these will consequently work towards reasonably achievable deadlines (2021 and 2027).
- 1.3.2. For surface water bodies, ‘good’ overall status can only be achieved if both good ecological status and good chemical status is recorded. Assessment of chemical status is recorded as ‘good’ or ‘fail’, and is tested based on a number of chemical elements for the most polluting chemical substances. Not all surface water bodies require chemical assessment.
- 1.3.3. Ecological status is assessed on a scale of high, good, moderate, poor and bad, and is based on three main elements:
- Biological elements- composition and abundance of aquatic flora, invertebrate and fish fauna;
  - Hydro-morphological elements (which support the biological elements)- hydrological regime, connection to groundwater bodies, river continuity and morphological conditions (depth, width variations, structure of river bed and riparian zone); and
  - Chemical and physico-chemical elements (which support the biological elements) - thermal, oxygenation and salinity conditions, acidification status, nutrient conditions and pollution by any substance.
- 1.3.4. Where the ecological status is below ‘good’, an assessment of the certainty of this status is made.
- 1.3.5. For a groundwater body to be in overall ‘good’ status, both quantitative and chemical status must be ‘good’. The ‘quantitative’ quality of a groundwater body is the degree to which is it affected by direct or in-direct abstractions. Quantitative elements assessed include:
- Impact on wetlands;
  - Impact on surface waters;
  - Saline Intrusion; and
  - Water balance.
- 1.3.6. Groundwater status is recorded as good or poor. ‘Good’ status is achieved when the level of ground water in the body is such that available resource is not exceeded by long-term annual average rate of abstraction. It also must not be subject to anthropogenic alterations that would result in; failure to achieve status, diminution of status or damage to terrestrial ecosystems which depend on the groundwater body.
- 1.3.7. Status is measured through a series of specific standards and targets.

### **1.4. Artificial or Heavily Modified Bodies**

- 1.4.1. The directive sets separate, less stringent goals for artificial and heavily modified water bodies (HMWB).
- 1.4.2. Good ecological status is defined as a ‘slight’ variation from the natural, undisturbed condition of the water body. Artificial and heavily modified water bodies (including urban rivers) are therefore unable to achieve their natural targets. As such, these water bodies

have a target of 'good ecological potential', which makes sure ecology is protected in so far as possible. Ecological potential is measured on a scale of bad to high, in the same way as ecological status. The chemical status of an artificial or heavily modified water body (HMWB) is measured in the same way as natural water bodies.

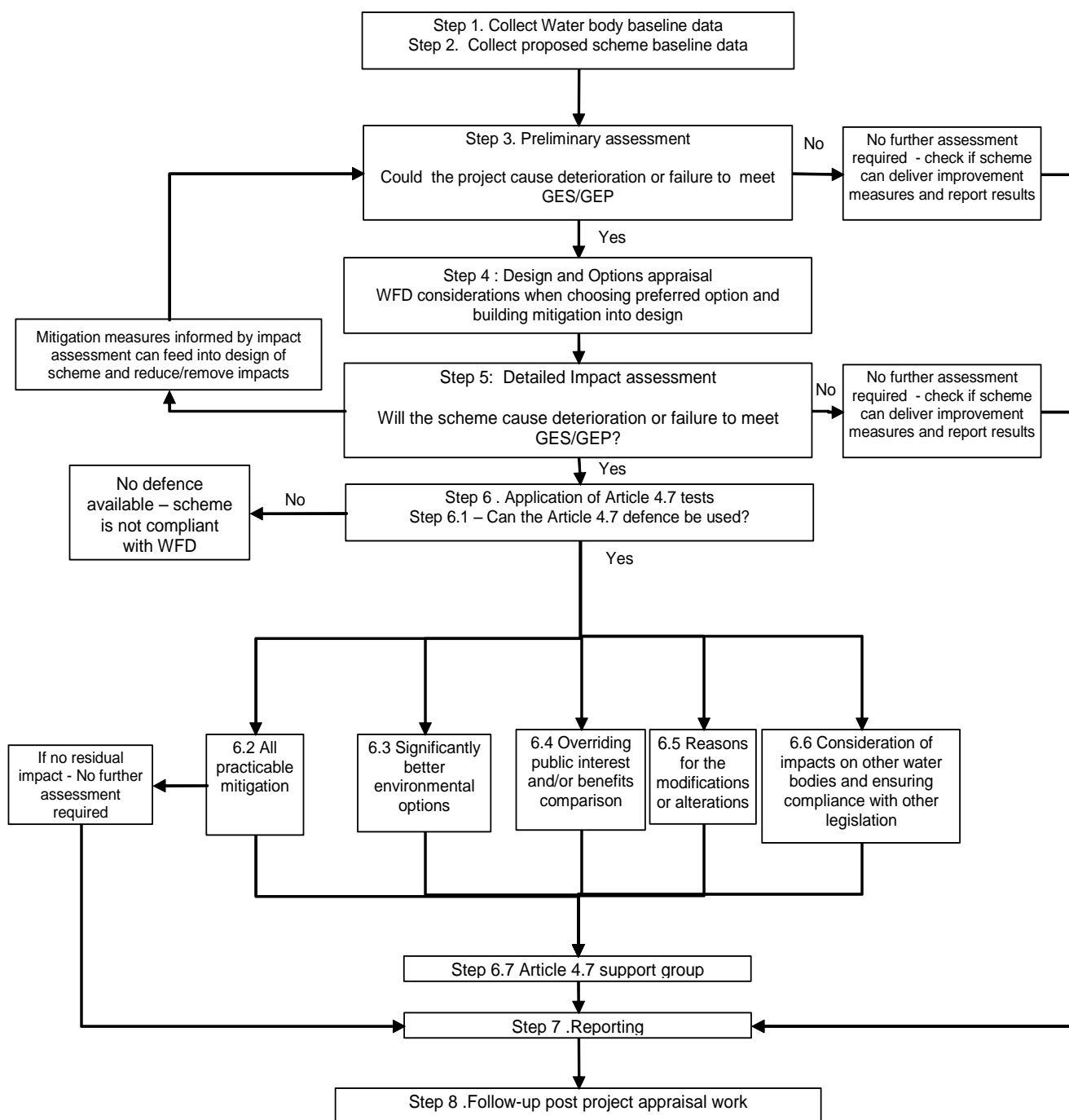
## **1.5. Prevention Deterioration in Status and Exceptions**

- 1.5.1. The objective to prevent deterioration in status must always be met no matter what the initial status is, and this is particularly important when deterioration may be caused by physical modifications. Developments and new activities may change physical characteristics of a surface water body (i.e. with a river diversion or new flood defence) or alter the water level of a groundwater body (i.e. with a new public supply borehole).
- 1.5.2. Any activity which has the potential to have an impact on the ecology of a water body will need consideration in terms of whether it could cause deterioration in its Ecological Status or Potential.
- 1.5.3. Ecological status is determined through analysis of its biological quality elements:
  - Fish;
  - Invertebrates;
  - Macrophytes; and
  - Phytobenthos.
- 1.5.4. These elements are supported by a series of physico-chemical and hydro morphological quality elements. Any activity, which either may have an impact of any of the biological quality elements, directly or in-directly by having an impact on the hydro morphology or physico-chemical elements, must be considered carefully in order to ensure there is no overall impact on the ecological status of the water body.
- 1.5.5. Only in exceptional circumstances is it acceptable to allow deterioration in status, and a number of conditions must be met before deterioration is allowed. This can be permitted under the terms of WFD Article 4(7) only if the modification provides important benefits to human health, human safety and/or sustainable development.

## **1.6. Assessment Methodology**

- 1.6.1. The Environment Agency has outlined an 8 step process to assess the compliance of proposed schemes with the Water Framework Directive, shown in Figure 1.1.
- 1.6.2. This methodology will be followed throughout this assessment.

**Figure 1.1 - Environment Agency's 8 step process to assess compliance of modifications with WFD**



## **2. Rother Valley Railway Scheme**

### **2.1. Location**

- 2.1.1. The location of the proposed extension of the Rother Valley Railway will extend from Robertsbridge to Bodiam Station with Northings, Eastings 573377, 123488 to 578305, 124995 respectively.
- 2.1.2. New infrastructure is required from The Clapper, Robertsbridge to east Junction Road, (573807, 124014) to Udiam Bridge (577186, 124322), covering a distance of approximately 3.4km.
- 2.1.3. The surrounding area is predominately agricultural land, with areas of woodland south of the proposed route. Residential areas within the vicinity of the scheme include Salehurst, Northbridge Street and Robertsbridge, which are all located at the westerly end of the proposed route, and Udiam Bridge to the most easterly point.
- 2.1.4. The River Rother has been altered and bypasses have been incorporated into the catchment in the past. The proposed scheme will cross the River Rother in two new locations; one crossing will be over a River Rother bypass known locally as the Mill Stream and other over the River Rother. A third river crossing of the River Rother already exists. There are additional crossings over land drainage ditches in the River Rother floodplain.
- 2.1.5. There are culverts and pipe embankments proposed along the new section of the route, as well as a new pipe, bridge and culvert along the existing disused section of the route. The culverts consist of boxes and pipes.
- 2.1.6. A number of farm access bridge will also be constructed which cross the Mill Stream downstream of Underbridge 12, a small field drain south of Salehurst and another two to the east of Salehurst.
- 2.1.7. The watercourse impacted by the proposal is illustrated in Figure 2.1<sup>3</sup>.

### **2.2. Scheme Overview**

- 2.2.1. The proposed scheme comprises of construction of railway line together with associated infrastructure.
- 2.2.2. The key element of the scheme will be construction of approximately 3.4km of single track ballasted railway line on the alignment of the former railway between Northbridge Street, Robertsbridge and the B2244 Junction Road near Udiam. This section of the track is the “missing link” that will enable trains on the Kent and East Sussex Railway to run the full distance between Tenterden in Kent to Robertsbridge in East Sussex (approximately 20km). Approximately 2km of the former railway corridor is still intact as delineated in the landscape by trees bounding the alignment (see Figure 2.2, Volume 4). The remainder of the route has been reclaimed as agricultural land.
- 2.2.3. With specific reference to water features, the scheme will comprise of the following:
  - 2 new bridges crossing the River Rother (including the Mill stream);
  - 2 new bridges across a linear water feature;

<sup>3</sup> Volume 4, Figure 2.1

- 1 existing bridge over the River Rother to be refurbished;
- 1 piped crossing of a tributary to the River Rother;
- 1 farm access bridge over the River Rother (Mill Steam);
- 15 culverts, 2 pipe embankments and 1 bridge along the route.

## **2.3. River Crossings**

- 2.3.1. Two new bridge crossings of the River Rother will be constructed for the new section of track. 'Underbridge 6' crosses the River Rother and 'Underbridge 12' crosses the locally known Mill Stream (classed by the Environment Agency as part of the River Rother). Three additional bridges are also proposed (Underbridge 16, 17 and 24) to cross the floodplain. In addition, there are 15 culverts and 2 pipe embankments planned. There is one existing structure from the original Kent and East Sussex Railway line, which crosses the River Rother and will be utilised in the proposed scheme.
- 2.3.2. Underbridge 6 will be constructed to allow the proposed railway embankment to cross the width of the River Rother east of The Clappers at approximately 573830, 124030. The bridge proposals are for a 10m span, rectangular structure, with soffit level of 10.863m AOD. The railway embankment will cross a large area of floodplain of the River Rother. The crossing is approximately perpendicular in this location and therefore no diversion of the watercourse will be required.
- 2.3.3. Underbridge 12 crosses the Mill Stream (River Rother bypass), close to the A21 at approximately 573830, 124030. The bridge structure proposed is a 10m, rectangular span with soffit level of 10.589m AOD. Realignment of the watercourse may be required to the bridge structure to ensure that the bridge supports can be constructed without reducing the flow area of the channel. It is also recommend that the abutments should be relocated to not obstruct flood flows or reduce capacity of the channel.
- 2.3.4. Underbridge 16 crosses at land drain that is a tributary to the River Rother. The location of the Underbridge 16 is approximately 574800, 124080. The bridge structure is a recycled (Ex-Staplehurst) steel span superstructure. The underbridge will have trough floor infilled with concrete with reinforced concrete walls to support the structure. The bridge structure proposed is 5.5m wide and has a soffit level of approximately 9.15m AOD. It is assumed that the structure has a clear span over the channel and no channel realignment is requires.
- 2.3.5. Underbridge 17 is located within western side of the pond positioned south of Salehurst at approximately 57485, 12406. The bridge structure is a recycled steel double span bridge (Ex-Staplehurst) superstructure. The underbridge is 5.5m wide with a soffit level of 8.99m AOD to 9.25m AOD depending on location. Reinforced concrete pier in the water body and reinforced concrete walls to support the structure.
- 2.3.6. Underbridge 24 crosses an agricultural land drain that drains into the River Rother. The underbridge structure is a recycled (Ex-Staplehurst) steel single span. The underbridge will have trough floor infill concrete structure with planned reinforced concrete walls to support the structure. The structure has a span of 5.5m wide and has a soffit level of 6.23m AOD. It is assumed that the structure has a clear span over the channel and no channel realignment is requires.
- 2.3.7. A number of farm crossings are planned for the proposed scheme. One will cross the River Rother downstream of the confluence with the Mill Stream at approximately 574220, 124020. There is another two potential crossings over agricultural land drains.

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Detailed design of these structures should be provided for the detailed WFD Assessment.

- 2.3.8. There are 13 culverts proposed for the scheme. There is a mixture of culverts in the form of 0.3m internal diameter pipes, 0.75m internal diameter pipes, 3m box culverts and 5m box culverts. The locations of structures are shown within Appendix 2 and Table 2.1: Summary of crossings on new section of track - bridges
- 2.3.9. The preliminary design drawings for the culverts show concrete footings (specification dependant on ground conditions) and backfilled with granular fill or selected fill as per the structural engineers design. The pipe culverts will also have hollow concrete block wall with reinforcement surrounding the pipe.
- 2.3.10. In addition to the culverts, there are two pipe embankments proposed for the new section of the railway. The pipe embankments are proposed to consist of concrete bedding with suitable infill backfilled with around three or four (depending on location) pipes of 2.5m as per the structural engineers drawings.
- 2.3.11. Land Drainage Consent is required for culverting of any watercourse, and the consenting authority varies between the Environment Agency for Main Rivers (River Rother and the Mill Stream) and the Lead Local Flood Authority (East Sussex County Council) for ordinary watercourses (all other watercourses such as tributaries, ditches and land drains).
- 2.3.12. Table 2.1 and table 2.2 show a summary of the proposed crossings for the scheme.

**Table 2.1: Summary of crossings on new section of track - bridges**

Location Number	6	12	16	17
<b>Watercourse crossing</b>	River Rother	Mill Stream (River Rother)	Dry Valley	Dry Valley
<b>Type of crossing</b>	Underbridge	Underbridge	Underbridge (single-span)	Underbridge (double-span)
<b>Construction in/adjacent to River</b>	Ex-Reading 12' wide span steel structure, 15m deep steel sheet pile, concrete. Height of opening approximately 3867mm. Width approximately 10m.	Ex-Reading 12'6" wide single-span steel bridge, steel sheet pile, concrete. Height of opening approximately 3m. Width approximately 10m but skew.	Ex-Staplehurst steel span bridge, trough floor infilled concrete, reinforced concrete walls. Height 2230mm. Width 2000mm.	Ex-Staplehurst steel span bridge (double), reinforced concrete pier, reinforced concrete walls. Height 1160mm. Width 6690mm x 2.
<b>Estimated Ground Level (m AOD)</b>	11.05	9.63	7.11	8.09
<b>Rail Level (m AOD)</b>	11.53	11.23	10.04	9.95

**Table 2.2 Summary of crossings on new section of track - Culverts**

<b>Location Number</b>	7	8	9	10	11	13	14	19	20	21	22	25
<b>Watercourse crossing</b>	No watercourse	No watercourse	No watercourse	No watercourse	No watercourse	Drain	?	?	Pond	Pond	?	?
<b>Type of crossing</b>	0.75m Pipe Culvert	5m Wide Box Culvert	5m Wide Box Culvert	5m Wide Box Culvert	5m Wide Box Culvert	Pipe Embankment	5m Wide Box Culvert	3m Box Culvert	3m Box Culvert	3m Box Culvert	Pipe Embankment	3m Box Culvert
<b>Construction in/adjacent to River</b>	Concrete slab, Reinforced concrete walls, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete bedding, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill	Concrete bedding, selected backfill	Concrete slab, Reinforced concrete walls, selected backfill
<b>Estimated Ground Level (m AOD)</b>	10.38	9.91	9.3	9.27	9.31		8.63	8.03	7.3	7.22		6.55
<b>Rail Level (m AOD)</b>	11.53	11.53	11.44	11.42	11.34	11.12	10.63	9.48	9.26	9.24	9.18	5.67

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## **2.4. River Diversions**

- 2.4.1. Minor realignment of the Mill Stream is likely to be required at Underbridge 12 to ensure that the bridge supports can be constructed without reducing the flow area of the channel. In addition, a number of agriculture drainage channels that enter the River Rother may require realignment or temporary diversion during construction to enable culverting of the watercourse through the proposed embankment.
- 2.4.2. Any sections of river realignment or diversion should be sensitively designed to ensure that the diversion mimics, or improves upon, the natural conditions of the channel. The river planform should be optimised to ensure that the meanders are replicated within the existing floodplain and are hydraulically stable. The gradient through the reach should be derived from detailed topographic survey to ensure that there is a constant gradient through the reach and there is scour protection on the bed of the channel at the entrance to the bridge structures. Habitats and vegetation should be protected, replicated and enhanced where possible.

## **2.5. Surface Water Runoff**

- 2.5.1. Any surface water runoff from the Rother Valley Railway should be intercepted to prevent oils or other potential pollutions from the running off directly into the watercourse.
- 2.5.2. A surface water management plan should be implemented before the detailed WFD Assessment is undertaken. Typically a railway would have a drainage system with at least three 'trains' in the SUDS system to attenuate flows from impermeable components and filter pollutants before discharge to the watercourse. The FRA also does not discuss runoff from the railway in terms of any impact on flood risk.

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### **3. Impacted Waterbodies**

#### **3.1. South East River Basin Management Plan**

- 3.1.1. A River Basin Management Plan (RBMP) for the South East region was prepared by the Environment Agency in 2009<sup>2</sup>. The plan describes the pressures facing the water environment in the South East River Basin District and the actions that will address them. It has been prepared under the Water Framework Directive, and is the first of a series of six-year planning cycles.
- 3.1.2. The RBMP covers one of the most unusual regions in England with the South and North Downs, White Cliffs, Solent and the New Forest. The Rother Valley is one of the catchments included.
- 3.1.3. The River Rother is a main river in the South East RBMP and flows into the sea at Rye. The River Rother catchment is passes primarily through rural area but is urbanised in parts as it flows through town centres such as Robertsbridge.

#### **3.2. Surface Water Body: Rother River**

- 3.2.1. The only surface water body impacted by the scheme is the River Rother. The watercourse is currently crossed in one place by the old Kent and East Sussex Railway infrastructure, which is at present being used as a pathway to cross the River Rother. The proposed scheme will cross the River Rother in two additional locations.
- 3.2.2. The River Rother is designated as a Heavily Modified Water Body (HMWB) due to urbanisation and flood defence structures.
- 3.2.3. Flood risk is a particularly concern in Robertsbridge and hence there has been significant modification to the River Rother as it passes through the town centre. This is the reason for the HMWB status of the watercourse, which aims to meet 'Good Ecological Potential (GEP)' rather than 'Good Ecological Status (GES)'. The 'Ecological Potential' classification acknowledges that it is not possible for the watercourse to be reach natural state, and instead aims for a best-case status.
- 3.2.4. Table 3.1 provides a summary of details for the River Rother from the River Basin Management Plan. Full details can be found in Appendix 1.

**Table 3.1 – River Rother WFD information taken from the South East RBMP**

<b>Waterbody Category and Map Code</b>	River- R29
<b>Waterbody ID and Name</b>	GB107040013640 Lower Rother from Robertsbridge to Iden
<b>National Grid Reference</b>	TQ 77519 24762
<b>Current Overall Status</b>	Moderate
<b>Status Objective (Overall)</b>	Good by 2027
<b>Status Objective(s)</b>	'Good' Chemical Status by 2015 'Good' Ecological Potential by 2027
<b>Justification if overall objective is not good status by 2015</b>	Technically infeasible for Ecological Potential
<b>Protected Area Designation</b>	Drinking Water Protected Area, Freshwater Fish Directive, Nitrates Directive.
<b>Hydro morphological Designation</b>	Heavily Modified

- 3.2.5. Quantity and Dynamics of Flow of the River Rother support 'Good' status, due to its predominantly natural state past Robertsbridge. However, morphological conditions do not currently support 'Good' status due to the presence of artificial agriculture land drains.

### **3.3. Groundwater Body: Kent Weald Eastern-Rother**

- 3.3.1. The Kent Weald Eastern-Rother is the ground water body underlying the Rother Valley.
- 3.3.2. Table 3.2 provides a summary of details for the Kent Weald Eastern-Rother from the South East River Basin Management Plan. Full details can be found in Appendix 1.
- 3.3.3. The quantitative status of the Kent Weald Eastern-Rother is currently 'Good'. All quantitative elements for groundwater are 'Good'.
- 3.3.4. The Kent Weald Eastern-Rother will not reach good quantitative status by 2015, as this is deemed 'disproportionately expensive'. It therefore aims to reach good status by 2027.
- 3.3.5. The Chemical status of the groundwater body is currently 'Poor'. All chemical quality assessments are deemed as 'Good' except impact on surface water chemical/ecological status which is 'Poor'.

**Table 3.2 – Kent Weald Eastern-Rother**

<b>Waterbody Category and Map Code</b>	Groundwater- G9
<b>Waterbody ID and Name</b>	GB40702G502200 Kent Weald Eastern-Rother
<b>Current Overall Status</b>	‘Good’
<b>Status Objective (Overall)</b>	Good by 2027
<b>Status Objective(s)</b>	Good Quantitative Status by 2015, Good Chemical Status by 2027
<b>Justification if overall objective is not good status by 2015</b>	Disproportionately expensive
<b>Protected Area Designation</b>	Drinking Water Protected Area

## 4. Assessment Methodology

### 4.1. Initial Data Collection

- 4.1.1. The River Rother is the only surface water body to be at potential risk as a result of this scheme.
- 4.1.2. The Rother River Basin Management Plan (RBMP) and the Environment Agency's internet maps were used to obtain the status classification and objectives of the precise reach of the water body. A detailed breakdown of the status elements is found in Annex B of the South East RBMP. The entries specific to this assessment can be found in Appendix A.
- 4.1.3. Information on the status and objective of the relevant groundwater body, the Kent Weald Eastern-Rother, was also obtained from the Environment Agency's website and the South East RBMP.

### 4.2. Preliminary Assessment Methodology

- 4.2.1. The initial stage of assessment screens the proposed Rother Valley Railway scheme elements against the Ecological and Chemical status objectives for the River Rother. Additionally, elements of the proposed scheme which have the potential to have an impact on the Kent Weald Eastern-Rother water body will also be assessed against the groundwater status objectives.
- 4.2.2. The initial screening aims to assess whether the scheme has any potential impact on the WFD objectives. Ecological status is particularly important, and assessing the impact of the scheme components on the biological elements (fish, invertebrate and aquatic fauna), either directly or in-directly via impact on the physico-chemical or hydro-morphological supporting elements, is key.
- 4.2.3. Following initial assessment, any proposed elements which do not pose any risk will be screened out and will not be considered further. Any part of the scheme which has the potential to cause a detrimental impact should be considered in the form of a detailed assessment.

### 4.3. Detailed Assessment Methodology

- 4.3.1. The second stage of assessment should consider any elements of the proposed scheme, which have the potential to cause a detrimental impact on the river or groundwater body.
- 4.3.2. Both long-term operational, and short-term construction impacts should be considered, and mitigation should be detailed where necessary to minimise impact as a result of the scheme.
- 4.3.3. Finally, the following objectives should be used to confirm that the general scheme elements comply with the overarching aims of the water framework directive. These objectives were derived from the Environmental Objectives of the Directive for both surface water and groundwater bodies (as listed in Section 1.2):
  - **Objective 1:** The proposed scheme element does not cause deterioration in the status of the water body (river or groundwater), in any component;

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- **Objective 2:** The proposed scheme element does not compromise the ability of the water body to achieve its WFD status objectives by the set date;
  - **Objective 3:** The proposed scheme element does not cause any negative impacts on other water bodies, or compromise achievements of any other water body; and
  - **Objective 4:** The proposed scheme contributes to the delivery of the WFD in a positive way.

4.3.4. If it is shown that the scheme will cause deterioration in the water body status or will impede the water body from reaching its objective status, then an assessment must also be made against Article 4(7) of the Water Framework Directive.

## 5. Preliminary assessment

### 5.1. Impact on Biological Elements

- 5.1.1. The South East River Basin Management Plan includes information on biological quality elements; fish, invertebrates and phytobenthos, which form components of the ecological status assessment. These elements should therefore be considered further in the assessment.
- 5.1.2. Phytobenthos are a particular issue for the River Rother; therefore care must be taken to avoid further deterioration. The current status for phytobenthos is 'moderate' (with very certain confirmation), and good status is not expected to be reached until 2015. Any efforts to improve this would therefore be beneficial.
- 5.1.3. For macro-invertebrates, the current status for the River Rother is 'good' and therefore exceptional care must be taken to ensure that this does not deteriorate. A number of aquatic invertebrate surveys have been carried out by the Environment Agency at Robertsbridge Pumping Station (TQ74170 23950), Russet Farm, Robertsbridge (TQ74600 23710), Etchingam (TQ71800 26200) and Udiam (TQ77130 24330) and these are included in Appendix 1.
- 5.1.4. Specific macrophyte surveys have also been carried out by the Environment Agency and these show a moderately diverse aquatic flora. Survey data was gathered at Robertsbridge Pumping Station (TQ74170 23950), West of Robertsbridge Pumping Station (TQ71400 23908), Robertsbridge Recreation Ground (TQ73643 23816), Bodiam (TQ78330 25300), Glottenham (TQ74145 23905), Etchingam (TQ71800 26200) and Udiam (TQ77130 24330) and are included in Appendix 1.
- 5.1.5. Annual fish surveys are undertaken by the Environment Agency at Salehurst (TQ 7418723976) and Bodiam (TQ 7858825357). These were last surveyed in July 2013 producing a wide variety of fish species including; Bullhead, Eel, Chub, Minnow, Pike, Perch, Roach, Stoneloach, Bleak, Silver Bream, Common Bream, Gudgeon, Brown/Sea Trout and Ruffe. Species richness at Salehurst is shown to be 'good' although there are limited signs of eel. Recruitment at Bodiam is shown to be 'excellent'. Survey data is included within Appendix 1.
- 5.1.6. The results of the fish survey show that the fish at these locations are associated with clean lowland watercourses which have both fast and slow flows. Moreover, the presence of minnows at both locations indicates that the River Rother is well oxygenated<sup>4</sup>.
- 5.1.7. The Kent and East Sussex Fisheries Survey Report by the Environment Agency for Salehurst and Bodiam (July 2010) also shows there are past records of salmonids within the fish counts from 2005 to 2008.
- 5.1.8. It is considered unlikely that the proposed development would impact on the nutrient status of the River Rother therefore potential effects on phytobenthos (diatoms) which are used as a measure of nutrient status are screened out of this assessment.

<sup>4</sup> Purnell *et al* (1998) The Concise Encyclopaedia of Fishing; Course, Sea and Fly Fishing.

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## **5.2. Impact on Supporting Elements**

- 5.2.1. The South East RBMP includes hydro-morphological quality elements for the River Rother.
- 5.2.2. The surface water plan for the railway embankment and bridges should be designed to not introduce oils or other pollutants from the proposed scheme or the disruption on the potentially contaminated old embankments into the river or groundwater bodies.
- 5.2.3. The RBMP also includes several physico-chemical quality elements for the water bodies including; ammonia, dissolved O<sub>2</sub>, pH, phosphate, temperature, copper and zinc. The current status of all of these supporting elements is generally 'good' or 'high'.
- 5.2.4. The construction of a railway embankment is unlikely to affect the quality of the watercourse since the majority of the crossings are proposed to be clear span bridges (one box culvert is proposed to be a double box culvert). There should be no long term impact on water quality as a result of any in-channel work; however there are potential risks during construction. As such, physico-chemical quality elements should be considered in the detailed assessment as a precautionary measure.

## **5.3. Impact on Chemical Status**

- 5.3.1. The overall chemical status of the River Rother is currently 'high', with all chemical elements presently at high level. The proposed scheme does not include any treated effluent discharge to surface waters and will not have any detrimental impact on the chemical status of the River Rother. Therefore, chemical status can be scoped out of further assessment.

## **5.4. Off-site Impacts**

- 5.4.1. The proposed scheme only covers the River Rother. Due to relative small scale of the scheme in relation to the Rother catchment, effects downstream of the immediate location are not considered to be an issue. As such, water bodies further downstream are not considered to be at risk as a result of this scheme and will therefore not be assessed further.
- 5.4.2. The nearest Natura 2000 site to the proposed scheme is Pevensey Levels SAC which is located 14km to the south west, with the hydrologically linked Dungeness to Pett Level SPA located 15 km to the south east. Due to the relatively small scale of the scheme, and consequentially the limited effects downstream, it is not considered that a Habitats Regulations Assessment is required since there is unlikely to be a significant effect on any Natura 2000 site.
- 5.4.3. The Environment Statement: Ecology and Nature Conservation chapter (Volume 2, Chapter 9) indicates that alterations to the land surrounding the proposed scheme may affect European Protected Species (EPS), namely; otters, bats, dormice and great crested newts. The scheme may also impact upon three habitats; broadleaved woodland, floodplain grazing marsh and ponds<sup>5</sup>. Mitigation measures have therefore been proposed to avoid and minimise adverse effects of the proposed scheme within the Ecology and Nature Conservation Chapter.

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<sup>5</sup> Environmental Statement: Ecology and Nature Conservation Chapter, CLM, April 2013 (Ref Volume 2, Chapter 9)

## **5.5. Impact on Groundwater Bodies**

- 5.5.1. The current quantitative status of the Kent Weald Eastern-Rother is 'poor' due to 'impact on surface water chemical/ecological status'. This indicates that any depletion or pollution of this ground water body could have a significant impact on linked surface water bodies. All others elements are considered 'good' but there is low confidence generally with the status classifications.
- 5.5.2. Saline intrusion is not a possibility in this location due to the proposed scheme being over 15km from the sea. These elements can be scoped out of the assessment.
- 5.5.3. There will be no direct pumped abstraction or cuttings into the groundwater body as a result of the proposed development. Therefore, there should be no impact on chemical status or pollution of the groundwater body as a result.
- 5.5.4. A section of the proposed scheme is within a UK Biodiversity Action Plan (UK BAP) Priority Habitat - Floodplain Grazing Marsh, which is defined as periodically inundated pasture, or meadow with ditches, which maintain the water levels and containing standing brackish or fresh water<sup>6</sup>. Marshes are a form of wetland and, since the part of the proposed scheme plans to cross the marsh; further assessment of the impact on groundwater will be required for these elements.
- 5.5.5. The Preliminary Contaminated Land Assessment (Ref Volume 3, Report 6) indicates that there is the possibility of contamination contained within the made ground, which comprises the old railway embankment. However, the assessment concludes that, given that the railway was constructed over 110 years ago it seems unlikely that significant pollution of groundwater would be ongoing via leaching contaminants from the waste in the embankments.
- 5.5.6. Nevertheless, it has been recommended that further risk assessment be carried out to determine whether disturbance due to construction of the proposed scheme could adversely affect the chemical status of the groundwater body. If so, there could be a detrimental impact on the chemical and ecological status of the connected surface water body, the River Rother. Therefore, the impact of this contamination on the groundwater and surface water bodies should be considered further in the form of a detailed assessment only if contamination is confirmed.

## **5.6. Temporary Works**

- 5.6.1. Temporary effects during construction may disturb aspects of the water bodies including; river flow, channel geometry, water quality and groundwater levels. The disturbance will be limited and all usual legislation adhered to in order to prevent flood risk, ecological damage or pollution incidents. This will be managed with appropriate mitigation as detailed within the CEMP.
- 5.6.2. Temporary bridge crossings over the River Rother have the potential to impact on fish, invertebrates, macrophytes and river morphology. Should any temporary bridge crossings be required, these should be considered within the detailed assessment. For additional confirmation, mitigation measures should be detailed, where appropriate, within further assessment and will be subject to agreement with the Environment Agency and Flood Defence Consent.

<sup>6</sup> BRIG (ed. Ant Maddock) 2008, UK Biodiversity Action Plan; Priority Habitat Descriptions: Coastal and Floodplain Grazing Marsh

## 5.7. Screening Assessment Summary

- 5.7.1. During this initial screening assessment, all potential impacts as a result of the scheme components have been considered. Some elements have been screened out of further assessment, however many elements will require further consideration.
- 5.7.2. Table 5.1 details each of the scheme components and the potential impact each could have on relevant status elements. The impact of these individual elements should be considered in detail once the proposed scheme design is finalised. The potential impact, designed mitigation and any resulting residual effects should be covered within a detailed WFD assessment.

**Table 5.1 - Potential impacts as a result of the scheme components**

Scheme Component	Surface Water Status		Groundwater Status	
	Ecological Status	Chemical Status	Quantitative Status	Chemical Status
Railway embankment	Yes	Yes, if contamination proved with existing embankment	Yes	Yes, if contamination proved with existing embankment
Underbridge 6	Yes	No	Yes	No
Underbridge 12	Yes	No	Yes	No
Underbridge 16	Yes	No	No	No
Underbridge 17	Yes	No	No	No
Underbridge 24	Yes	No	No	No
Surface Water Drainage	Yes	No	No	No
Box Culverts	Yes	No	Yes	No
Pipe Culverts	Yes	No	Yes	No
Pipe Embankment	Yes	No	Yes	No
River realignment for Underbridge	Yes	No	Yes	No
River realignment for Culverts	Yes	No	Yes	No
Temporary river crossings [if any]	Yes	No	Yes	No

## **6. Recommendations for detailed assessment**

### **6.1. Overview**

- 6.1.1. A detailed assessment will be required in order to assess the specific scheme components on the quality elements indicated as potentially at risk in
- 6.1.2. Table 5.1. However, a thorough and detailed assessment cannot be undertaken for the proposed scheme at this stage since elements of design are yet to be finalised. This section evaluates the preliminary design of the proposed scheme and provides recommendations ensure compliance with the Water Framework Directive.
- 6.1.3. Consideration must be given to both long-term operational and short-term construction impacts of the proposed scheme on surface and groundwater bodies.
- 6.1.4. Mitigation measures will be required to ensure there are no detrimental impacts to water bodies as a result of the proposed scheme. Details of mitigation measures will be formulated once scheme design has been completed. In addition, further assessment should detail any potential improvements which could be made to the water body as a result of the proposed scheme where feasible and practicable.

### **6.2. Ecological Status: Biological Quality Elements**

- 6.2.1. A detailed assessment will be required in order to assess each of the specific scheme components, and their individual details where necessary, on each of the ecological status elements.

### **6.3. Embankments**

- 6.3.1. The embankments of the proposed scheme will have no long-term effect on biological quality elements of the River Rother. However, during construction, there could be the potential for pollution from vehicles or spillages on site. The CEMP details pollution prevent mitigation measures, which include the presence of spill kits on site and construction staff suitably qualified and experienced in their use. The Control of Pollution (Oil Storage) Regulations 2001 will be adhered to on site, with regards to storage of oils and fuel on site.

### **6.4. River Crossings**

- 6.4.1. Underbridge 6 and Underbridge 12 will be constructed with sheet steel pile caissons and concrete plugs in the riverbed.
- 6.4.2. The sheet piles will create a hard, vertical wall from bed to surface level, which could potentially have long-term impacts on the River Rother. The trench sheeting will not allow small fish and macro-invertebrates to burrow into the bankside at this location, and macrophytes cannot thrive on the sheet piles.
- 6.4.3. Sensitive design measures such as rock rolls could mitigate against the lack of environment for fish and macro-invertebrates beneath the bridge structures and could support macrophyte communities. Detail of sensitive mitigation measures will be included as part of the detailed design stage, and should be evaluated against the objectives of the WFD during the detailed assessment.

- 6.4.4. During construction of all underbridges, care should be taken to avoid sediment disturbance and bank collapse. Sediment disturbance due to work within the river can lead to increased sediment transport and turbidity within the river.
- 6.4.5. Bridge crossing should be designed with surface water drainage to mitigate any detrimental effects to the watercourse and be fit for purpose.
- 6.4.6. Any temporary bridge crossings which may be required in order to facilitate construction of the proposed scheme should be designed to ensure there is no disturbance within the channel which may impact upon fish, invertebrates or macrophyte habitats within the River Rother.

## **6.5. Culverts**

- 6.5.1. The Environment Agency provides detailed information on culverting watercourses and this advice should be adhered to during detailed design: <http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide/Chapter8.aspx?pagenum=6>.
- 6.5.2. However, this was not prepared specifically with regards to the Water Framework Directive. The Scottish Environment Protection Agency (SEPA) state that the culverting of watercourses in regards to the WFD would only be acceptable on small crossing of less than 2m in width<sup>7</sup>. In addition, culvert crossings must be justified fully. SEPA state that culvert crossings are only justified if other options are demonstrated to be unsuitable, with disproportional costs or technical infeasibility, and if the influence is likely to be negligible within watercourse. Moreover, mitigation measures must ensure impacts for culverts are no greater than at any other crossings structures.
- 6.5.3. In term of impacts on biological quality, culverts must not be barrier to fauna, natural flow rates, depths and velocities must be maintained, and consideration must be given to light levels within the culvert.

## **6.6. River Diversions**

- 6.6.1. If required, river diversions and realignments should include the following detailed design measures to ensure impacts to biological quality elements are mitigated:
- Woody debris, gravel beds and any bank features should be replicated as closely as possible where notably present;
  - Pool-riffle features should be recreated in areas where these are found to be present in the lost river reach;
  - Standard channel cross sections should be based on standardised section of the reach from detailed topographic survey;
  - Gradients through the river diversion reach should be constant and derived from detailed topographic survey; and
  - Additional riverine habitats should be provided with backwaters, bank enhancements or in-channel features where possible and feasible.

<sup>7</sup> SEPA (December 2006 Version 1.2) SEPA Position Statement to support the implementation of Water Environment (Controlled Activities) (Scotland) Regulation 2005: Culverting Watercourses.

- 6.6.2. The river planform should be optimised to ensure that the meanders are replicated where possible and are located within the existing floodplain. A two-stage channel approach through meanders could help provide habitat at lower return period flows.
- 6.6.3. Overall, the design should aim to replicate and, where possible, enhance upon the existing reach to provide habitat variation for fish and invertebrates.

## **6.7. Ecological Status: Physico-Chemical Elements**

- 6.7.1. There is a risk to River Rother as a result of pollutants from surface water drainage from the track entering the watercourse. Drainage design should ensure that all water runoff into the watercourse is intercepted by at least three streams of treatment. These could include infiltration, filtration, detention, trapped gullies or swales.
- 6.7.2. Mitigation by design must ensure there is no long-term impact on the water quality of the River Rother. This should be assessed under detailed assessment.
- 6.7.3. Mitigation will also be required during construction of the proposed scheme to ensure there is no impact on physico-chemical supporting elements. Appropriate mitigation strategies are suggested below:
- Leaving dead vegetation to rot in the channel can cause release of hydrogen sulphide which can kill fish. If any vegetation is cut as a result of construction of the bridges, it should not be allowed to drop into the channel. Any excess vegetation in or near the watercourse should be removed.
  - Care must also be taken to reduce disturbance of dust or sediments when moving or transporting material near the watercourse. This can cause turbidity in the water which may upset ion exchange rates between aqueous and solid phases of inorganics. Dust also contributes to nitrogen and phosphorus loading.
  - Straw bales could be used to intercept any runoff from the construction site into the watercourse (HR Wallingford, River Diversion Design Guide).
- 6.7.4. Detailed assessment should assess specific construction information against the objectives of the WFD to ensure no negative impact on the River Rother.

## **6.8. Ecological Status: Hydro-morphology Quality Elements**

- 6.8.1. Detailed assessment should measure the impact of each of the proposed scheme elements on the hydro-morphological supporting elements of the River Rother's ecological status. Key concerns include; continuity and sediment transport, hydrological regime, fluvial flow and morphological conditions.

## **6.9. Embankments**

- 6.9.1. The proposed embankments will have no effect on the River Rother's hydro-morphological quality elements in the long term or during construction.

## **6.10. River Crossings**

- 6.10.1. The preliminary designs for Underbridge 6 and 12 show sheet piles, which create a hard vertical wall beneath the structures, and could have long term impacts on the River Rother. Trench sheets do not allow for erosion and consequently a lack of sediment

transport will occur downstream. In addition, vertical bank profiles will be created which have the potential to change fluvial flow patterns.

- 6.10.2. Alterations to flow velocities could affect ecological receptors in two ways. Firstly, if velocities increase significantly this could result in increased scour through bridges, washing out of river gravels, disturbing habitats and impeding passage of fish upstream. Conversely, if flow velocity is significantly reduced, this could result in increased silt deposition and smothering of gravels. Further information will be required to advise the detailed WFD assessment and understand potential effects on flow velocities.
- 6.10.3. Underbridge 6 and 12 are the only two new bridges over the River Rother (including the Mill Stream) along the 3.4km route. Both are clear span bridges and although the support structures will be partially in the flow area of the channel, any impacts are expected to be localised.
- 6.10.4. Mitigation measures such as rock rolls can mitigate against the change of fluvial flow patterns and allow some material to be transported downstream. Moreover, the rock rolls can also reduce erosion of the steel pile footing. Full, specific mitigation measures may be required based on the detailed assessment to ensure any impact on hydro-morphological conditions is mitigated.

## **6.11. Culverts**

- 6.11.1. By contrast to bridges, there are a significant number of culverts along the line of route. Although all the culverts are of tributaries and not the River Rother, the route is in close proximity to the River Rother and the crossings are near the outfalls. Therefore any localised impact on a tributary could have an indirect impact on the River Rother and a detailed assessment of the impact on hydro-morphological elements will be required.
- 6.11.2. Mitigation measures mentioned within the SEPA Culverting Watercourses document suggests the following design aspects:
- the soffit level of culvert should be greater than natural bank height;
  - culvert alignment should match alignment of watercourse;
  - culvert should be the same width as the natural active channel;
  - culvert base should be submerged to allow a naturalised culvert bed to be maintained; and
  - culverts must not exacerbate flooding, natural flow depths must be maintained and there should be no changes to flow regime.
- 6.11.3. There is potential for impacts on surface watercourses during construction of the culverts. Care should be taken to avoid excess sediment disturbance and prevent flood events as a result of temporary blockage of watercourses.

## **6.12. River Realignments and Diversions**

- 6.12.1. Should permanent minor river realignments be required, there will be the potential for a risk to hydro-morphological aspects of the River Rother. All diversion designs should be based on the following factors to reduce the impact on hydro-morphological conditions:
- The river planform, where possible, should follow the topographic lows of the floodplain and be located within the 100 year event flood area;

- The planform shape should be based on the sinuosity of the reference reach, mimicking the existing where possible; and
- The river planform should be designed to cross perpendicular to the scheme in order to reduce the length of the crossing required.

6.12.2. Channel realignments present opportunities for habitat enhancement as part of the scheme. Where possible and feasible diversion design could seek to increase the river length (by approximately 20%) and create additional habitat conditions by providing a range of cross sectional shapes and channel dimensions to vary flow velocities throughout the reach.

6.12.3. River realignments should be modelled hydraulically to determine the impact on flow velocities through the reach, and ensure there is no impact in terms of flood risk.

### **6.13. Groundwater Impacts**

6.13.1. A detailed assessment will be required in order to assess each of the specific scheme components on the groundwater elements for the Kent Weald Eastern Rother groundwater body.

6.13.2. The scoping assessment highlights that there are potential risks to the BAP Floodplain Grazing Marsh at the western end of the proposed scheme, from the construction of the embankment and underbridges 6 and 12. Additionally, the detailed design of culverts is yet to be completed, and therefore potential impacts on the wetland area as a result cannot be excluded at this stage. Connectivity to surface water habitats is a key concern for groundwater in the WFD, and once construction methodologies are confirmed, detailed assessment should seek to confirm that the proposed scheme will not have any detrimental effects on groundwater via the wetland area.

### **6.14. Contaminated Land**

6.14.1. The Preliminary Land Quality Risk Assessment indicates that there is the possibility of contamination contained within the made ground which comprises the old railway embankment. However, no trials pits or in-situ tests were conducted to confirm contamination and ultimately more conclusive testing and evidence is required.

6.14.2. Disturbance of any contamination as a result of the proposed scheme could adversely affect the chemical status of the groundwater body beneath the area. This could, as a result, have a negative impact on the chemical and ecological conditions of the River Rother.

6.14.3. Until conclusive contamination assessment has been undertaken, potential risks under the WFD cannot be ruled out. Therefore, this screening assessment concludes that there is the potential of a risk to both ground and surface waterbodies due to disturbance of contaminated land within the old embankment.

### **6.15. Objective Assessment**

6.15.1. Finally, an overarching assessment is required to conclude whether the proposed scheme components impacts upon the general objectives of the Water Framework Directive assessment.

6.15.2. The four objectives of the Water Framework Directive are:

- 
- The proposed scheme element should not cause deterioration in the status of the water body (river or groundwater), in any component
  - The proposed scheme element does not compromise the ability of the water body to achieve its WFD status objectives by the set date
  - The proposed scheme element does not cause any negative impacts on other water bodies, or compromise achievements of any other water body
  - The proposed scheme contributes to the delivery of the WFD in a positive way.

6.15.3. Until such time as detailed assessment has been completed, the proposed scheme's compliance with the objectives of the WFD cannot be confirmed.

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## **7. Conclusions**

- 7.1.1. The proposed scheme presents the potential for a number of impacts on the ecological status of the River Rother, either directly on biological elements (fish, invertebrates or macrophytes), or in-directly via impacts on water quality and hydro-morphological conditions. In addition, there is potential for impact on the Kent Weald Eastern-Rother groundwater body via supported areas of marshland within the floodplain.
- 7.1.2. Any proposed scheme elements which have the potential to negatively impact upon the waterbody or cause deterioration in status, require full, detailed WFD assessment. Although this initial assessment was able to scope out certain aspects of the proposed scheme from further assessment, detailed design and construction methodologies are required to complete a full assessment.
- 7.1.3. Mitigation of potential impacts can be provided with sensitive design and best practice construction of embankments, bridges, culverts and diversions (if required). All detailed design should be based on robust baseline data, including topographic, geomorphological and ecological survey information, and detailed hydraulic modelling. A number of key design principles have been recommended within this report; in order ensure effects on surface water ecology, physico-chemistry and hydro-morphology are negligible and these should be taken into consideration during detailed design.
- 7.1.4. All construction work should adhere to the guidelines set out in the CEMP and best practice pollution control methods are recommended to avoid contamination of the watercourse. All temporary works should be sensitively re-instated and will be subject to agreement with the Environment Agency. Best practice methods for rescue and transfer of fish, invertebrates and macrophytes from culvert construction or river diversions (where necessary) should be undertaken with advice from an ecological clerk of works. Monitoring and feedback on water quality, channel morphology and ecology should be undertaken during and after construction.
- 7.1.5. Further site investigation is required in order to investigate potential contaminated land within the old railway embankment. Should contamination be confirmed, appropriate remediation methods will need to be undertaken during construction to ensure there is no leaching of contaminants and no resulting impact on surface or groundwater bodies. This should be considered as part of the detailed WFD assessment.
- 7.1.6. Detailed, finalised design with exact locations and construction methodology plans are required to complete a full detailed WFD assessment. However, provided that the suggested mitigation measures outlined within this report are implemented within the final design this screening assessment suggests that the proposed scheme is unlikely to cause a significant detrimental impact on either the River Rother or the Kent Weald Eastern-Rother groundwater body.

## **APPENDIX 1**

### **Baseline Data**

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## **Baseline Data**

### **River R29- Lower Rother from Robertsbridge to Iden**

Environment Agency, Annex B South East River Basin District, December 2009

### **Groundwater G9-Kent Weald Eastern-Rother**

Environment Agency, Annex B South East River Basin District, December 2009

### **Environment Agency Fish Survey**

Kent and East Sussex Fisheries Report for Salehurst and Bodiam with an update for Summer 2013

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## **APPENDIX 2**

### **Drawings**

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**J.C. White Geomatics Limited**

Title Plans Drawing Number Plan B1, B2, B3, B4 and B5

**Halcrow-Underbridge 6 and 12.**

RVR-UB6-001 Rother Bridge Site Plan

RVR-UB6-002 Rother Bridge No.6 (BR2377) Deck General Arrangement Ex Cow Lane  
12'0" wide

RVR-UB12-001 Mill Stream Site Plan

RVR-UB12-002 Rother Bridge No.12 (BR2375) Deck General Arrangement Ex Cow Lane  
12' 6" wide

**Alan Hayworth**

Bridge 7, 15, 18 & 23, 0.75 Diameter Pipe Culverts

Bridge 8, 9, 10, 11 & 14, 5m Wide Box Culverts

Bridge 13 & 22 Pipe Embankments

Bridge 16-Superstructure Ex-Staplehurst

Bridge 17-Superstructure Ex-Staplehurst, 2-spans

Bridge 19, 20, 21 & 25, 3m Width Box Culverts

Bridge 24-Superstructure Ex-Staplehurst

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## **APPENDIX 3**

### **Glossary**

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## Glossary

EA	Environment Agency
CEMP	Construction Environmental Management Plan
GEP	Good Ecological Potential
GES	Good Ecological Status
HMWB	Heavily Modified Water Body
RBMP	River Basin Management Plan
SEPA	Scottish Environment Protection Agency
WFD	Water Framework Directive

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## **6) Contaminated Land Assessment (SLR)**

(Appendices available on request)

Rother Valley Railway Reinstatement  
Robertsbridge to Bodiam

Preliminary Land Quality Risk Assessment

SLR Ref: 402.00985.00007

November 2013



## EXECUTIVE SUMMARY

In July 2013, SLR Consulting Ltd was commissioned by Temple Group Limited on behalf of Rother Valley Railway Limited to provide consultancy services to support a planning application for the proposed reinstatement of the Rother Valley Railway between Robertsbridge and Bodiam. Whilst an Environmental Statement prepared by Temple Group will mention land quality, it is intended that this report will best serve to support the planning application with respect to those matters.

This document, a Preliminary Land Quality Risk Assessment, presents information with respect to the site's environmental setting, land use history and the potential for contamination. The information has been used to identify the likely contaminant sources, receptors and pathways; to form a preliminary conceptual site model; and to identify potential pollutant linkages taking account of the fact that:

- soil will be removed from the railway (embankment) footprint prior to the commencement of bulk earthworks and stored on site awaiting placement post-construction;
- bridge abutments will be formed in concrete and culverts will comprise pre-cast concrete;
- pedestrian and bridleway crossings will consist of a granular "Type 1" fill material laid across the track formation to form a surface;
- the developer will, at some point (most likely following receipt of planning approval), have full site access and will have the opportunity prior to commencement of construction works to carry out visual inspections and ground investigations – with land quality assessments designed to identify necessary protective / remedial measures if needed;
- the site in question is a railway line and in operation employees and visitors will not have routine exposure to the ground, save perhaps at the halt which may have managed / landscaped gardens.

Given the proposed commercial use as a rail line with halt the most significant PPL appear to be:

- **PPL1a** - Potential Harm to Human Health Outdoors from Exposure to PCBs in the Ground Adjacent to / under Previous Transformer Locations;
- **PPL 1b & 1c** - Potential Pollution of Surface Water and Groundwater by Various Contaminants in Made Ground;
- **PPL2a** - Potential Harm to Human Health Outdoors from Exposure to Various Contaminants held in Historic Wastes within Embankments / Ballast;
- **PPL 2b** - Potential Damage to Future Structures from Exposure to Aggressive Ground;
- **PPL3** - Potential Harm to Human Health Outdoors from Exposure to Various Contaminants held in Contaminated Ballast;
- **PPL4** - Potential Harm to Human Health from Contaminants in Landscaping Soils;
- **PPL5** - Potential for Harm to Health and Building Damage from Hazardous Gases; and
- **PPL 6** - Potential Risks to Health or the Environment from Unidentified Sources

Our recommendations for further investigation and assessment of PPL 1, 2, 3 & 5 are presented in **Section 5**, whilst **Section 6** recommends voluntary preventative and remedial actions concerning PPL4 and PPL6 and discusses the validation of those works.

## CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	Background	1
1.2	Proposed Development	3
1.3	Objectives	4
1.4	Scope of Work	4
1.5	Data Sources	5
<b>2.0</b>	<b>SITE DETAILS, SETTING AND HISTORY</b>	<b>6</b>
2.1	Site Vicinity Description	6
2.2	Physical Site Setting	8
2.3	Environmental Search Data	9
2.4	Site History	9
<b>3.0</b>	<b>OUTLINE CONCEPTUAL MODEL AND PRELIMINARY LAND QUALITY RISK ASSESSMENT</b>	<b>12</b>
3.1	Regulatory Context	12
3.2	Physical Conceptual Site Model	14
3.3	Chemical Conceptual Site Model	14
<b>4.0</b>	<b>FURTHER INVESTIGATION AND ASSESSMENT</b>	<b>24</b>
4.1	Health - PPL 1a, PPL2a & PPL3	24
4.2	Controlled Waters - PPL 1b&c	24
4.3	Property - PPL 2b and PPL5	25
<b>5.0</b>	<b>VOLUNTARY PREVENTATIVE AND REMEDIAL ACTIONS AND VALIDATION OF THOSE WORKS</b>	<b>26</b>
5.1	Voluntary Preventative Action to Avoid PPL 4	26
5.2	If Needed - Voluntary Remedial Action to Break PPL 6	27
5.3	Land Quality / Remedial Works Validation Report	27
<b>6.0</b>	<b>CLOSURE</b>	<b>28</b>

## APPENDICES

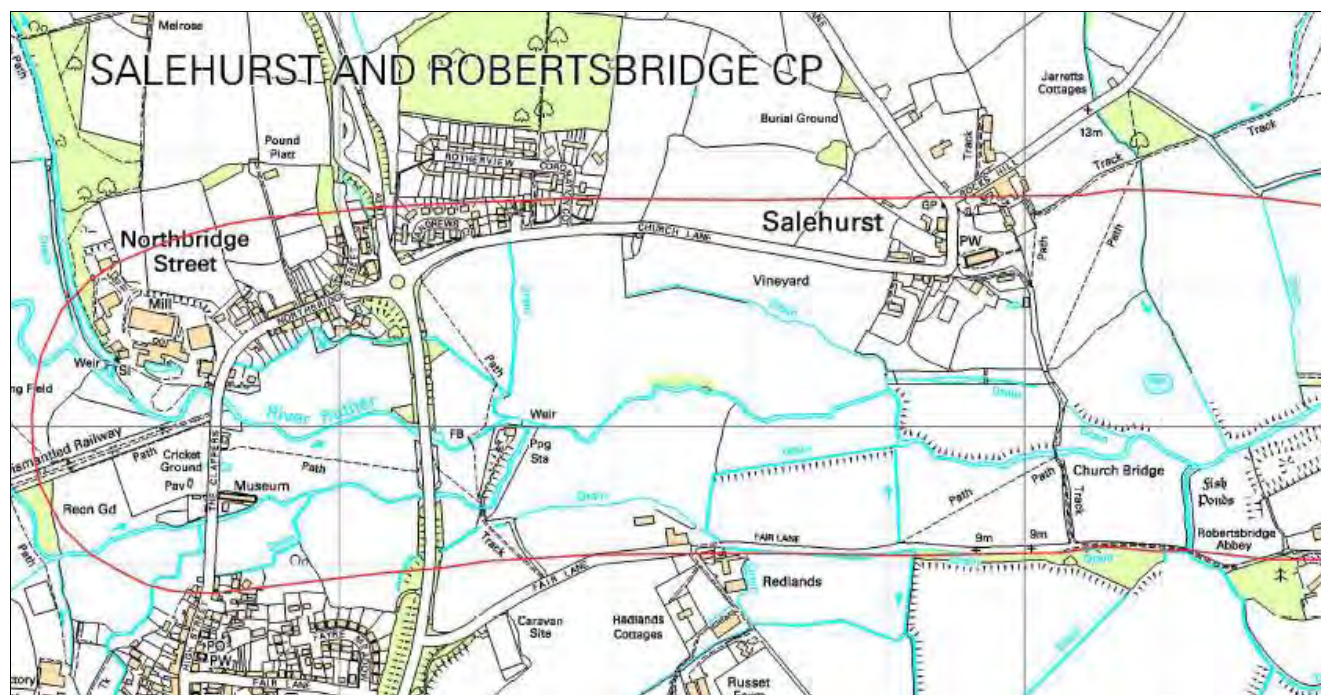
<b>Appendix A</b>	<b>GroundSure EnviroInsight Report including Historical Ordnance Survey Map Extracts, September 2013</b>
<b>Appendix B</b>	<b>GroundSure GeoInsight Report, September 2013</b>

## 1.0 INTRODUCTION

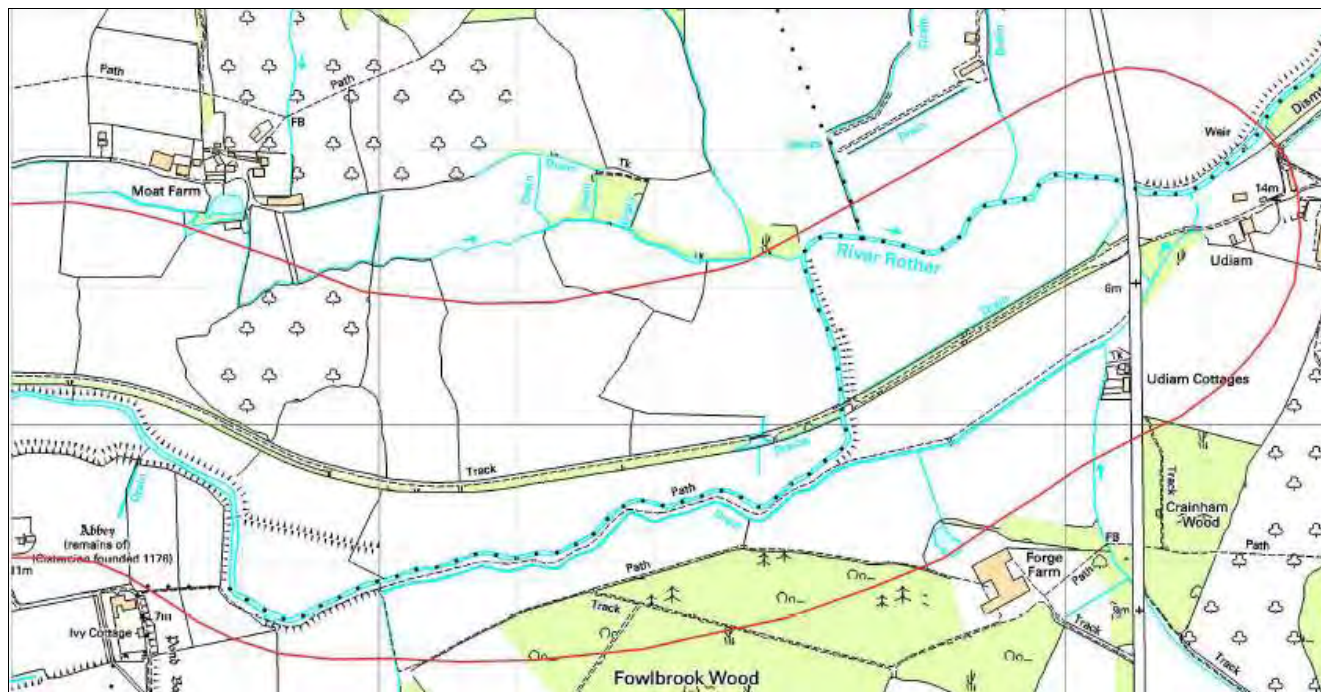
### 1.1 Background

SLR Consulting Ltd (SLR) was commissioned by Temple Group Limited on behalf of Rother Valley Railway (RVR) Limited in July 2013 to undertake a Preliminary Land Quality Risk Assessment (PLQRA) for the proposed reinstatement of the Rother Valley Railway between Robertsbridge and Bodiam. Whilst an Environmental Statement prepared by Temple Group will mention land quality, it is intended that this report will best serve to support the planning application with respect to those matters. The new line will bisect the land edged in red on **Figures 1-1** and **1-2** which are Ordnance Survey map extracts dated 2002 (from Groundsure).

**Figure 1-1**  
**Overall View of Site - West**



**Figure 1-2**  
**Overall View of Site - East**



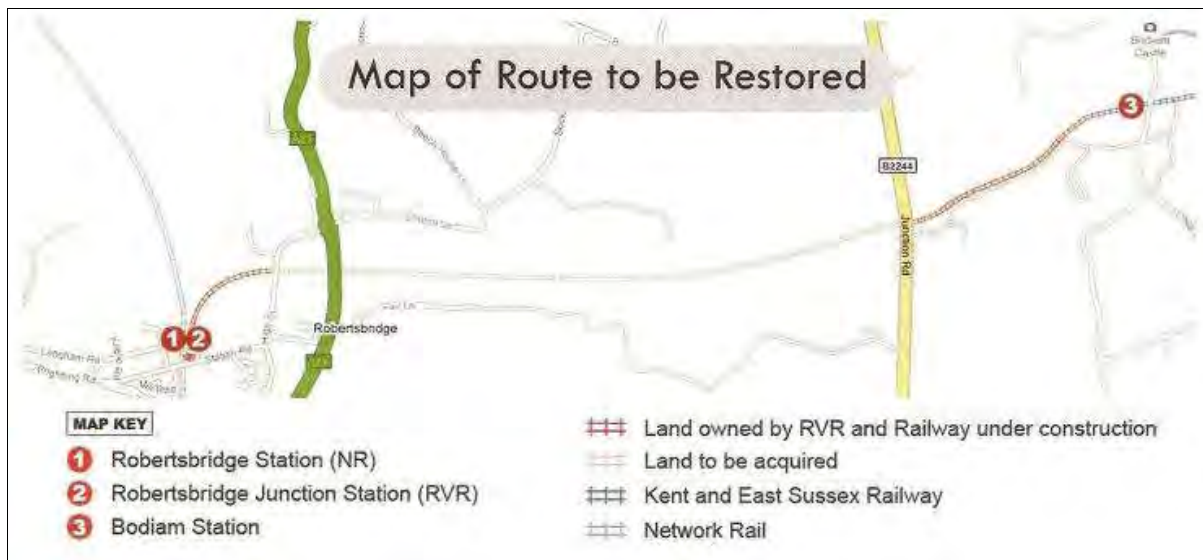
This report has been prepared by SLR's Land Quality Group based at the Bradford on Avon office of SLR, Treewood House, Rowden Lane, Bradford on Avon, Wiltshire, BA15 2AU, Tel: 01225 309 400.

## 1.2 Proposed Development

Based in Robertsbridge, RVR has been active since its establishment in 1991 but maintains its original corporate goal of reconstructing the Rother Valley Railway; a line which operated between 1900 and 1961.

The section of rail line to be reinstated, see **Figure 1-3**, runs from Northbridge Street (Robertsbridge) to Junction Road (west of Bodiam), a distance of approx. 3.5 kilometres, and rebuilding of the halt at Salehurst - something which would bring tourists to the village and off-site farm shop. The line at either end of that being proposed has already been constructed, stopping adjacent to the roads. In fact, at Robertsbridge, new bridges and rail have been laid from Northbridge Street to the mouth of the RVR station, which is currently under construction. Those activities are covered by a previous planning consent.

**Figure 1-3**  
**Map of Route to be Restored (from <http://www.rvr.org.uk/maps.html> )**



In common with the original, the reinstated line will follow the courses of the River Rother and its tributary, the Newmill Channel. The original line, much of which was carried on a low embankment, required 24 bridges and culverts and numerous level crossings. The reinstatement project is not simple, and involves construction works spanning between 18 and 24 months. Broadly speaking, these are the construction activities:

- enabling works – creation of site compound and formation of temporary access roads;
- flood defence enhancements;
- earthworks - embankment construction;
- placement of track sub-base (which will then be used as the haul road);
- construction of bridges, culverts and level-crossings;
- placement of ballast; and finally
- installation of signalling and rails.

Activities which involve interaction with the ground are:

- **Topsoil Stripping and Excavation** - topsoil will be removed from the railway embankment footprint immediately prior to the commencement of bulk earthworks. Topsoil would be stored on site in uncompacted mounds, prior to reinstatement post-construction.

- **Track Bed** – a geotextile membrane will be laid prior to placement of sub-base.
- **Underbridges 6 and 12** - sheet piles approximately 15m in length would be vibro-piled into the ground either side of the channel and 3m deep concrete bridge abutments would be formed behind the piles. The bridge structures would be lifted onto the abutments using mobile cranes.
- **Culverts** - culverts would be constructed utilising pre-cast concrete units.
- **Pedestrian and Bridleway Level Crossings** - these crossings would consist of a granular "Type 1" fill material laid across the track formation to form a surface for users walk on.

Ultimately the reinstated line will carry both coal fired steam engines and diesel powered engines.

### 1.3 Objectives

This redevelopment project falls under the remit of the Town and Country Planning Regulations and requires an Environmental Impact Assessment.

Sussex County Council (SCC) and Rother District Council (RDC) will be aware of the potential for historic contamination. Their technical specialists will expect RVR to satisfy local and national planning policies and show that the site is suitable for its new use taking account of:

- ground conditions - considering both natural hazards and pollution arising from previous uses;
- the development proposals - including any proposals for mitigation / land remediation; and
- impacts on the natural environment arising from the development / remediation proposals.

The Council will also want the developer's land quality advisor to consider whether the land, once developed, would be capable of being determined as Contaminated Land under Part 2A of the Environmental Protection Act 1990.

Given the above, SLR recommended a standalone PLQRA to inform the client's development team and support the planning application. We also advised that the PLQRA may be the first in a series of risk assessments, all of which should follow guidance provided by Defra and the Environment Agency in CLR11 Model Procedures for the Management of Land Contamination.

The secondary objective of this PLQRA is to establish if there is any evidence of significant subsurface contamination from past or present activities on or adjacent to the site which could give rise to abnormal development costs i.e. expenditure on remedial works to deal with unacceptable risks to the environment or RVR employees / visitors / contractors along the proposed reinstatement.

### 1.4 Scope of Work

SLR's PLQRA report briefly considers the risks to controlled waters, human health and the proposed infrastructure.

SLR's scope is outlined below:

- review of historic OS mapping;
- purchase and review of environmental data pack;

- review of borehole logs from the British Geological Survey (BGS) database;
- review of geological map;
- preparation of a report presenting:
  - the desk study data;
  - a site conceptual model with preliminary risk assessment; and
  - recommendations for further assessment steps.

## 1.5 Data Sources

This report has been produced following consultation with the sources of information summarised in **Table 1-1**.

**Table 1-1:  
Information Sources**

Information Type	Source
General topography and Site setting	Google Earth Bing Maps <a href="http://www.streetmap.com">www.streetmap.com</a>
Site and background information	GroundSure EnviroInsight including Historical Ordnance Survey Map Extracts purchased 17 September 2013 ( <b>Appendix A</b> ). GroundSure GeoInsight purchased 17 September 2013 ( <b>Appendix B</b> )
Hydrogeology and Geology	Environment Agency (EA) website. British Geological Survey (BGS) Sheet 304, Tenderden, Solid & Drift Edition, 1:50,000 scale.
Historic Background	<a href="http://www.rvr.org.uk">www.rvr.org.uk</a>

## 2.0 SITE DETAILS, SETTING AND HISTORY

### 2.1 Site Vicinity Description

**Figure 2-1** provides an aerial image, and **Table 2-1** summarises the property details. Information within the table has been derived from Ordnance Survey (OS) mapping. Plans showing the site's location, surrounds and layout are provided in **Appendix A**.

**Figure 2-1**  
**Aerial View of Site**



**Table 2-1:**  
**Site Details**

Address	The linear site has no address as such, the National Grid Reference for the site is 575050,124173.
Site Location	The section of rail line to be reinstated runs from Northbridge Street (Robertsbridge) to Junction Road (west of Bodiam), a distance of approx. 3.4 kilometres.
Recent Site Activities <sup>1</sup> and Site Description	<p>In 1973 an organisation now known as the Kent &amp; East Sussex Railway (KESR) was successful in purchasing the disused line between Tenterden and Bodiam, but the preservationists failed to gain permission to take over the section between Bodiam and Robertsbridge. Subsequently that stretch of line was lifted and the track abandoned – falling into various ownerships. A separate company, now RVR, was formed in 1991 with the view of reconstructing the railway between Bodiam and Robertsbridge. Since that date, the railway has been acquiring parts of the track bed as and when possible. Negotiations continue with the remaining landowners to secure the remainder of the route.</p> <p>The eastern half of the old line is apparently walkable albeit now heavily overgrown. Due to access constraints, SLR has not been able to visually inspect the land, but it is clear from aerial imagery that the route has become vegetated with emergent trees / scrub. The image below shows the eastern extremity of the proposed line (with the rail line across the road to the east) and the vegetation / woodland shown between the two agricultural fields is typical / representative of that found along the entire eastern half of the proposed route.</p>

<sup>1</sup> Some text taken from <http://www.rvr.org.uk/history.html> and edited.



One or two relatively short sections of the western half of the proposed route have become vegetated with emergent trees too, but for the most part evidence of the former railway is absent – the land having been returned to agriculture. Aerial imagery shows that the proposed route is arable farmland broken at points by field boundaries / hedges. The image below shows the eastern extremity of the proposed line (with the rail line across the road to the west) and the planted / ploughed agricultural fields and hedge boundaries are typical / representative of that found along the majority of the western half of the proposed route.



Fuel Storage Tanks	There is no evidence of modern or historic fuel / oil storage tanks along the proposed route.	
Surrounding Land Use	North	Agricultural land and woodland with numerous drainage ditches and a tributary of the River Rother. In the east of the site, the River Rother is located to the north. The settlements of Salehurst and Northbridge Street are present.
	East	Railway, surrounded by agricultural land and woodland.
	South	Agricultural land and woodland with numerous drainage ditches. In the west of the site, the River Rother is located to the south
	West	The Clappers (road), beyond which is a railway surrounded by a cricket ground and agricultural land.

## 2.2 Physical Site Setting

A summary of the main physical features of the Site are given in **Table 2-2**. Information has been derived from the GroundSure Report and other sources.

**Table 2-2:**  
**Summary of Physical Site Features**

<b>Geography and Geology</b>	Gradient	The site is generally flat, although sections where the embankment remains is generally elevated.
	Elevation	The site is at an elevation of approximately 8 metres above Ordnance Datum.
	Made Ground	A series of former railway embankments exist in the eastern portion of the site. The origin and chemical composition or the material used to construct these embankments is not known.
	Superficial Drift Geology	The site is underlain by alluvium comprising silt, peat sand and clay.
	Solid Geology	The alluvium is recorded as being directly underlain by the Ashdown Formation, which comprises interbedded sandstone and siltstone.
	Radon Gas	The proposed development does not include the development of dwellings, but in any case no radon protective measures are necessary.
	Mining, and Ground Stability Hazards	GroundSure suggests the site is not within a coal mining affected area and that there are negligible to moderate ground stability hazards from shrinking / swelling clay, landslides, compressible ground and running sands. The risk of landslide is very low to low. Non-coal mining – There may be some gypsum extraction in the vicinity and some rare iron ore extraction although this would have been minor in scale and restricted in extent.
Hydrology	Surface Water and River Network	The proposed line of the railway follows the valley of the primary River Rother and crosses it and some of its smaller tributaries, of which there are many, at certain points. The main River meanders roughly east south east toward Rye Harbour where it discharges to the sea.
	Flood Risk	The site, at around 8m AOD lies inside the Environment Agency Flood Zone 3 (annual probability of flooding as 1:100) based on fluvial and tidal models.
	Surface Water Abstractions	The nearest surface water abstractions are from the River Rother, with the water used for spray irrigation.
Hydrogeology	Aquifer	The Environment Agency aquifer records classify the alluvium as a Secondary (undifferentiated) Aquifer. Ashdown Formation is classified as a Secondary A Aquifer.
	Groundwater Abstractions	There are no potable groundwater abstractions within 500m of the Site, there is There are two groundwater abstractions within 480-500m

	of the site, one for farming and one for irrigation.
Source Protection Zones	There are no groundwater source protection zones within 500m of the site.

## 2.3 Environmental Search Data

The EnviroInsight report, presented in **Appendix B**, was reviewed to gain commercially available environmental data for the site and its immediate vicinity. A summary of the search information is provided below:

- Sites Determined as Contaminated Land – there are no sites within 500m determined as Contaminated Land under Part 2A EPA 1990.
- There are two Part B Permitted premises, off site in Northbridge Street, but within 500m - these are Favor Parker who compost animal feed, and Scatts agricultural merchants
- Discharge consents – there is one off-site consent within 500m, for sewer storm overflow.
- EA recorded pollution incidents – there are 10 records within 500m of the site, all of relatively minor nature and occurring in 2002 and 2003 – 7 of the instances had no impact on land with the remainder having minor impact.
- Landfill sites – there are no operational or historic landfill sites within 250m of the site – the nearest is at approximately 290-300m off site and is an historic landfill noted to have taken inert waste.
- Other Waste Sites (Operational and Historic) – none listed within 500m.
- Oil and Gas Pipelines - There are no records of high pressure oil and gas pipelines within 500m.
- The potentially contaminative current industrial land uses within 500m are relatively low risk – substations and a vineyard. There are no fuel stations.
- Environmentally Sensitive Sites – the site is within the High Weald Area of Outstanding Natural Beauty and there are Ancient Replanted Woodlands nearby..

Groundwater and surface water abstraction data was discussed in **Section 2.2**.

## 2.4 Site History

This section presents a summary of the site's history from a review of OS map extracts and a small amount of web based research. Whilst the age and general type of activity and land use can often be determined from the type and layout of structures depicted on OS maps, specific elements of site operations cannot normally be determined. Large scale (1:2,500 and 1:10,560) historical map extracts were reviewed for selected years between 1872 and 2012.

A summary of the findings is given in **Table 2-3** and the OS maps are provided in **Appendix A**. Given the length of the site and for ease of interpretation, **Table 2-3** presents the data for the west of the site (Section A1) separately to the east of the site (Section B1), as per **Figure 2-2**, below.

**Figure 2-2:  
West Section (A1) and East Section (B1) of the Site<sup>2</sup>**



**Table 2-3:  
Site History Summary**

Map Dates	Description
1872 - 74	<p><b>West:</b> The site is undeveloped and crosses a number of fields, along with a mill race (a tributary of the River Rother) and a road.</p> <p><b>East:</b> The site is undeveloped and crosses a number of fields, the River Rother and a road.</p> <p><b>Off-site:</b> The surrounding land use is predominantly agricultural and woodland with the River Rother generally located to the south. Dykes are present along the majority of the northern and southern banks of the River Rother and field ditches are located around the boundaries of most the fields. Northbridge Street, with a corn mill, and Robertsbridge are located approximately (c.) 100m northwest and c.250m southwest of the site, respectively. Salehurst is located c.100m to the north of the western section and Udian is located c.150m east of the site. A spring is located 150m south of the eastern extent of the site. A railway line, which runs north-south, is present c.500m west of the site, with a station located c.600m southwest. A brick works and associated kiln, and a gas works are present adjacent to the station. The remains of a Cistercian Abbey (c.1176) and associated grounds, fish ponds and chapel are present c.250m to south of the centre of the site.</p>
1897	<p><b>West:</b> No significant changes in the west of the site.</p> <p><b>East:</b> No significant changes in the east of the site.</p> <p><b>Off-site:</b> The area to the immediate north and south of the site is marked 'liable to floods'. The gas works is no longer present. The railway line to the west is marked as Tunbridge Wells and Hasting Branch of the S.E.R. The brick works has expanded and is marked as a brick and tile works. A saw pits are located c.760m southwest of the west of the site and c.400m north of the centre of the site.</p>
1908	<p><b>West:</b> The site comprises a single gauge railway line, marked as the Kent and East Sussex Railway, which is on an embankment and crosses the mill race and roads. Tanks, presumably water tanks, are present in the western extent of the site and extend off site. A wetland / reed bed type area is present on site directly south of Salehurst. Much of the land to the south of the railway line is marked as marsh land.</p> <p><b>East:</b> The site comprises a single gauge railway line, marked as the Kent and East Sussex Railway, which is on an embankment and crosses the River Rother and a road. Much of the land to the south of the railway line is marked as marsh land. The far east of the site is marked as Junction Road Halt.</p> <p><b>Off-site:</b> The Kent and East Sussex Railway line extends off site to the east and to</p>

<sup>2</sup> Image from GroundSure

Map Dates	Description
	the west. In the west it joins the Tunbridge Wells and Hastings Branch and also has a branch to the corn mill. Sewage filters are present adjacent to the brick and tile works.
1928 - 29	<b>West:</b> No significant changes on site. <b>East:</b> No significant changes on site. <b>Off-site:</b> The tile and brick works are no longer marked; allotment gardens are present. The saw pit is marked as a saw mill. The railway to the west is marked Southern Railway. A gravel pit is present c. 400m south of the western section of the site.
1946 - 48	<b>West:</b> No significant changes on site. <b>East:</b> No significant changes on site. <b>Off-site:</b> No significant changes.
1957	<b>West:</b> No significant changes on site. <b>East:</b> No significant changes on site. <b>Off-site:</b> No significant changes.
1975 – 77	<b>West:</b> The site is marked as dismantled railway / track; however the embankment remains in situ. The reed bed to the south of Salehurst is marked as a pond. <b>East:</b> The site is marked as dismantled railway / track; however the embankment remains in situ. A pond is present in the east. <b>Off-site:</b> The railway line, which extends from site, remains present to the west and is marked as disused to the east. The branch line to the mill is no longer present and the mill is an animal foodstuff mill. The tanks in to the west of the site are marked as a pumping station. A works is present in the location of the former brick works. The saw mill to the southwest has been extended. A depot is present in the location of the gravel pit to the south of the site, which appears to have been filled in.
1991 – 93	<b>West:</b> A new road (the A21T) crosses the site north-south on an embankment. <b>East:</b> No significant changes. <b>Off-site:</b> The railway, which extended off site, is no longer present, with the exception of the construction of the A21T. The depot to the south of the site is marked as a caravan site.
2002 - 12	<b>West:</b> No significant changes. <b>East:</b> No significant changes. <b>Off-site:</b> No significant changes.

In summary, the site comprised agricultural land and was crossed by river and road systems, until the construction of the Kent and East Sussex Railway and its associated embankments and infrastructure - which became operational in 1900. The site operated as a railway until 1961 and was dismantled in the mid-1970's, leaving some embankments and water features. No significant changes have been evident on site since the mid-1970s, save for the construction of the A21(T) in the early 1990s, which crosses the west of the site north-south.

Potentially contaminative historic off site land-uses have included, extension of the railway line on site, a gas works (600m off site), a corn mill, a brick and tile works (c.600m), a gravel pit, a railway station, saw mills and a depot. However, all of these activities are considered to be too distant to have had a significant impact on the site.

### **3.0 OUTLINE CONCEPTUAL MODEL AND PRELIMINARY LAND QUALITY RISK ASSESSMENT**

#### **3.1 Regulatory Context**

##### **3.1.1 *The Contaminated Land Regime – Overhauled for 2012***

Spring 2012 saw substantial changes in the UK's Contaminated Land Regime with a complete overhaul of the legal guidance<sup>3</sup> and deletion of long-standing pollution control policies<sup>4</sup> in favour of the National Planning Policy Framework<sup>5</sup>.

The new Contaminated Land Statutory Guidance is very different from the 2006 issue and consultation draft. Whilst the regime continues to advocate a precautionary approach to dealing with contaminated land, there is clear direction to avoid the “*excessive cost burdens*” of “*wastefully expensive remediation*”.

In their Impact Assessment Defra estimate that:

*“20%-40% of current remediation work is “unnecessary” and that these costs can be avoided through clearer Guidance and new technical tools to describe the new Category 1-4 system”*

For clarity:

- Category 1: describes land which is clearly problematic;
- Categories 2 and 3: cover the less straightforward land where detailed consideration is needed before deciding whether it is Category 2 (contaminated land requiring remedial action) or Category 3 (not contaminated land) - wider socio-economic factors come into play if health risks assessment fails to produce a decision; and
- Category 4: describes land that is clearly not contaminated land.

The new Category 4 test is particularly important in defining when land is clearly not contaminated land in the legal sense; it introduces the idea that it would be exceptional for land: exhibiting normal background levels of contamination; or contaminant levels below published assessment criteria (which are due to be augmented by new screening levels) to be considered as contaminated land.

Importantly, the new guidance makes it clear that regulators can only require remediation to a point where land is no longer contaminated land in the legal sense (i.e. the boundary between Categories 2 and 3) and not require “*unnecessary*” clean up to attain Category 4 standards. This means some landowners / developers will choose a remedial end-point in Category 3 whilst others will still volunteer to clean-up to Category 4 (to deal with perception issues or to please funders, etc).

From this point on, exceedance of a Soil Guideline Value should simply trigger further risk assessment.

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<sup>3</sup> Environmental Protection Act 1990 Part 2A Contaminated Land Statutory Guidance, Defra, April 2012.

<sup>4</sup> Planning Policy Statement 23: Planning and Pollution Control, ODPM, November 2004.

<sup>5</sup> National Planning Policy Framework, DCLG, March 2012.

With the introduction of clearer legal guidance, the introduction of the concept of “normal” background levels of contaminants and an emphasis on the use of science and risk assessment to make better and more reasonable decisions about when land does (and does not) need to be remediated and to what degree, the government predicts financial savings to:

- businesses and other owners of land with a significant legacy of historical land contamination;
- the construction sector and new home-buyers via a substantial reduction in deadweight remediation costs; and
- the taxpayer from reduced costs for publicly-funded remediation projects.

#### *National Planning Policy Framework*

This redevelopment project falls under the remit of the Planning Act and is subject to both local and national planning policies.

Annex 2 of PPS23<sup>6</sup> entitled Planning and Pollution Control advised on the circumstances when it might have been appropriate for local planning authorities to grant planning permission for developments on land affected by contamination. Its replacement, the National Planning Policy Framework (NPPF) of March 2012 has a core aim to:

- encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value.

Slightly modifying the messages of Annex 2, the new NPPF says the planning system should contribute to and enhance the natural and local environment by:

- preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and
- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Furthermore NPPF says that planning policies and decisions should also ensure that:

- a site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation; and that
- after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990 (meaning Category 3 or 4).

In essence, these simple messages replace all 42 pages of Annex 2 including the example planning conditions in Appendix 2B, and the Model Planning Conditions for development on land affected by contamination set out in a letter to Chief Planning Officers by DCLG in May 2008.

It is clear that the national planning policy directs those involved in development to ensure sites are suitable for use and not be capable of being determined as contaminated land

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<sup>6</sup> Planning Policy Statement 23: Planning and Pollution Control, Annex 2: Development on Land Affected by Contamination, ODPM, 2004.

under Part 2A – which means that the category of land, post remediation (if required) should be considered.

### 3.2 Physical Conceptual Site Model

The physical Conceptual Site Model (CSM) is anticipated to be relatively simple, with either:

- the natural alluvium surcharged by an historic embankment made of unknown materials (predominantly in eastern half of site); or
- (predominantly in western areas) land currently used for arable crop production: agricultural soils over natural alluvium with the possibility of some historic embankment/track-bed material entrained in the soil.

We would expect groundwater to be present at approximately the elevation of the River Rother, so around 6-7m above Ordnance Datum (AOD) – not more than a few metres below ground level.

### 3.3 Chemical Conceptual Site Model

Due to access constraints, SLR has not been able to visually inspect the land, but it is clear from aerial imagery that the route has become vegetated with emergent trees / scrub or is in use for crop production.

Historic mapping and modern aerial imagery have not lead to the establishment of specific areas of chemical concern by SLR (i.e. there are no mapped tanks or coal heaps, etc and no clear images of land devoid of vegetation, etc) but with no close-up visual evidence and no intrusive ground investigation (targeted or otherwise), SLR is reliant on published guidance to establish which *potential* contaminants may have entered the ground during the relatively short operational period of the railway; 61 years from 1900 to 1961. The most relevant source of guidance is the Industry Profile for Railway Land produced by the Department of the Environment in 1995. Table 1 from that document, reproduced below, in **Figure 3-1**.

**Figure 3-1:  
Extract from Industry Profile**

**Table 1 Main groups of contaminants and their probable locations**

**Railway land**

Location or process	Running lines	Stations	Sidings and freight yards	Freight depots	Signal box lamprooms	Infrastructure engineering workshops	Electrical substations	Engineering landfill sites	Roofing
<b>Chemical group</b>									
Fuel oils									
Lubricating oil									
Paraffin									
PCBs									
PAHs									
Solvents									
Ethylene glycol									
Creosote									
Herbicides									
Ferrous residues									
Metal fines									
Asbestos									
Ash									
Sulphate									

Shaded boxes indicate areas where contamination is most likely to occur.

The relevant column of the table is that for Running Lines. The potential sources of contaminants are:

- **Source 1: Land beneath Electrical Transformer(s)** – it is not known whether the site once had transformers, but it is the case that some historic oil-filled transformers in the UK did contain PCBs.
- **Source 2: Waste within Embankments / Ballast** - the embankments in the east of the site may well have been constructed with natural excavated materials but if there had been a shortfall it is possible that waste materials such as clinker and ash were also used. Similarly track ballast in the UK is normally crushed rock (granite, limestone or sandstone) but sometime crushed slag or steam locomotive ash was used. Potential contaminants are: metals, phenols, sulphates and polycyclic aromatic hydrocarbons (PAH) compounds.
- **Source 3: Contaminated Ballast** – (1) fuel oils, lubricating oils and greases may cause localised contamination of ballast in location where locomotives have stood – the only candidate site is the halt at Salehurst. There is also the possibility for ethylene glycol. (2) herbicides may have been used to prevent the growth of weeds on the tracks or along the lineside. (3) creosote used to preserve wooden sleepers may have entered the ground along the line.

Obviously those pollutants, *if* present in 1961, may be present at reduced concentrations or may not be present at all when the proposed railway opens - given the decommissioning process in the 1970's and 55 years environmental degradation.

Other, perhaps more minor, sources of contamination are:

- **Source 4: Soils** (majority of which are now in agricultural use) along the previous route which may contain contaminants by virtue of having been under or adjacent to the old railway – and hence may contain traces of coal ash, metal fines, etc (Note – in particular this source refers to soils which will be removed from the railway footprint and placed elsewhere as landscaping soils post-construction; and
- **Source 5: Hazardous Gases** - naturally occurring methane, carbon dioxide and perhaps others hazardous gases from within the alluvium associated with the river valley which may contain organic matter and peat.

And, of course there may be:

- **Source 6: Unexpected / Unidentified Contamination** – which may be revealed by the earthworks.

The normal procedure for assessing land dictates that potential contaminants, pathways and receptors should be considered within the context of contaminant or pollutant linkages. An evaluation of the risks associated with each linkage should drive decisions regarding the status of the land as contaminated and requiring remediation, uncontaminated or requiring further investigation.

The information summarised in the previous sections has been used to identify the likely contaminant sources, receptors and pathways present at the Site. The elements of the conceptual model built into **Table 3-1**, overleaf, have been used to consider the potential pollutant linkages (PPL), their significance and acceptability.

It must be remembered that:

- soil will be removed from the railway (embankment) footprint immediately prior to the commencement of bulk earthworks and stored on site awaiting placement post-construction;
- bridge abutments for two underbridges will be formed in concrete, partly in the ground, and culverts will be constructed in pre-cast concrete;
- pedestrian and bridleway crossings will consist of a granular “Type 1” fill material laid across the track formation to form a surface;
- the developer will, at some point (most likely following receipt of planning approval), have full site access and will have the opportunity prior to commencement of construction works to carry out visual inspections and ground investigations – with land quality assessments designed to identify necessary protective / remedial measures if needed;
- the site in question is a railway line and in operation employees and visitors will not have routine exposure to the ground, save perhaps at the halt which may have managed / landscaped gardens

Given the proposed use as a commercial rail line with halt the most significant PPL appear to be:

- **PPL1a** - Potential Harm to Human Health Outdoors from Exposure to PCBs in the Ground Adjacent to / under Previous Transformer Locations;
- **PPL 1b & 1c** - Potential Pollution of Surface Water and Groundwater by Various Contaminants in Made Ground;
- **PPL2a** - Potential Harm to Human Health Outdoors from Exposure to Various Contaminants held in Historic Wastes within Embankments / Ballast;
- **PPL 2b** - Potential Damage to Future Structures from Exposure to Aggressive Ground;
- **PPL3** - Potential Harm to Human Health Outdoors from Exposure to Various Contaminants held in Contaminated Ballast;

- **PPL4** - Potential Harm to Human Health from Potential Contaminants in Landscaping Soils;
- **PPL5** - Potential for Harm to Health and Building Damage from Hazardous Gases; and
- **PPL 6** - Potential Risks to Health or the Environment from Unidentified Sources

NB PPL1 concerns Source 1, PPL2 concerns Source 2, etc.

In addition, soil quality should be assessed to facilitate appropriate waste disposal options in the event of excavation and removal during construction, piling, etc.

**Table 3-1:  
Outline Conceptual Site Model**

Source / Area of Concern	Contaminant(s)	Receptors	Likelihood of PPL Forming & Comment on Consequence	Next Step in Procedure
<b>Source 1: Land beneath Electrical Transformer(s)</b> – it is not known whether the site once had transformers, but it is the case that some historic oil-filled transformers in the UK did contain PCBs.	PCBs	Humans – Inside the train: Future workers & visitors	Unlikely – humans in the train should have insignificant exposure.	-
		Humans – Outdoors: Future workers & visitors	<b>PPL 1a:</b> Unlikely that visitors would be exposed, but workers may and there is some potential harm to health from exposure to contaminants via dermal contact (primarily) and ingestion/inhalation.	<b>PPL 1a:</b> Further Investigation & Assessment – see <b>Section 4.1</b>
		Humans – Neighbours	Unlikely	-
		Property – Built Environment: Future structures	Unlikely that that exposure to PCB would result in significant deterioration of buried concrete/piles	-
		Property - Flora / Fauna: Crops	Unlikely – crops will not be grown	-
		Surface Water: River Rother	<b>PPL 1b&amp;c:</b> Possible that soluble contaminants migrate laterally via groundwater to the surface water. However, given a 55 year interval it seems extremely unlikely that significant pollution continues.	<b>PPL 1b&amp;c:</b> Further Investigation & Assessment – see <b>Section 4.2</b>
		Groundwater: Secondary Aquifer, flow towards River Rother) No potable groundwater abstractions between site and river.		
		Ecosystems	Unlikely – none present within a reasonable distance from the site	-

Source / Area of Concern	Contaminant(s)	Receptors	Likelihood of PPL Forming & Comment on Consequence	Next Step in Procedure
<b>Source 2: Waste within Embankments / Ballast</b> - the embankments in the east of the site may well have been constructed with natural excavated materials but if there had been a shortfall it is possible that waste materials such as clinker and ash were also used. Similarly track ballast in the UK is normally crushed rock (granite, limestone or sandstone) but sometime crushed slag or steam locomotive ash was used.	Potential contaminants are: metals, phenols, sulphates and polycyclic aromatic hydrocarbons (PAH) compounds.	Humans – Inside the train: Future workers & visitors	Unlikely – humans in the train should have insignificant exposure.	-
		Humans – Outdoors: Future workers & visitors	<b>PPL 2a</b> Unlikely that visitors would be exposed, but workers may and there is some potential harm to health from exposure to contaminants via dermal contact (primarily) and ingestion/inhalation.	<b>PPL 2a:</b> Further Investigation & Assessment – see <b>Section 4.1</b>
		Humans – Neighbours	Unlikely	-
		Property – Built Environment: Future structures	<b>PPL 2b</b> Possible that exposure to aggressive ground would result in significant deterioration of buried concrete abutments/culverts.	<b>PPL 2b:</b> Further Investigation & Assessment – see <b>Section 4.3</b>
		Property - Flora / Fauna: Crops	Unlikely – crops will not be grown	-
		Surface Water: River Rother	<b>See PPL 1b&amp;c</b>	<b>See PPL 1b&amp;c</b>
		Groundwater: Secondary Aquifer, flow towards River Rother) No potable groundwater abstractions between site and river.		
		Ecosystems	Unlikely – none present within a reasonable distance from the site	-

Source / Area of Concern	Contaminant(s)	Receptors	Likelihood of PPL Forming & Comment on Consequence	Next Step in Procedure
<b>Source 3: Contaminated Ballast</b> – (1) fuel oils, lubricating oils and greases may cause localised contamination of ballast in location where locomotives have stood – the only candidate site is the halt at Salehurst. There is also the possibility for ethylene glycol. (2) herbicides may have been used to prevent the growth of weeds on the tracks or along the lineside. (3) creosote used to preserve wooden sleepers may have entered the ground along the line.	Fuel oils, lubricating oils and greases plus ethylene glycol – at Salehurst	Humans – Inside the train: Future workers & visitors	Unlikely – humans in the train should have insignificant exposure.	-
	Herbicides and creosote along the line.	Humans – Outdoors: Future workers & visitors	<b>PPL 3:</b> Unlikely that visitors would be exposed, but workers (at Salehurst and along the line) may and there is some potential harm to health from exposure to contaminants via dermal contact (primarily) and ingestion/inhalation.	<b>PPL 3:</b> Further Investigation & Assessment – see <b>Section 4.1</b>
		Humans – Neighbours	Unlikely	-
		Property – Built Environment: Future structures	Unlikely that that exposure to contaminants listed would result in significant deterioration of buried concrete/piles	-
		Property - Flora / Fauna: Crops	Unlikely – crops will not be grown	-
		Surface Water: River Rother	<b>See PPL 1b&amp;c</b>	<b>See PPL 1b&amp;c</b>
		Groundwater: Secondary Aquifer, flow towards River Rother) No potable groundwater abstractions between site and river.		
		Ecosystems	Unlikely – none present within a reasonable distance from the site	-

Source / Area of Concern	Contaminant(s)	Receptors	Likelihood of PPL Forming & Comment on Consequence	Next Step in Procedure
<b>Source 4: Soils</b> (majority of which are now in agricultural use) along the previous route which may contain contaminants by virtue of having been under or adjacent to the old railway – and hence may contain traces of coal ash, metal fines, etc (Note – in particular this source refers to soils which will be removed from the railway footprint and placed elsewhere as landscaping soils post-construction).	Various contaminants – possibly metals, hydrocarbons & PAH compounds	Humans – Inside the train: Future workers & visitors	Unlikely – humans in the train should have insignificant exposure.	-
		Humans – Outdoors: Future workers & visitors	<b>PPL 4:</b> Potential harm to human health from exposure to contaminants within imported landscaping soils via ingestion, dermal contact and inhalation outdoors (from outdoor soil)	<b>PPL 4:</b> Voluntary Preventative Action – in order to prevent the risks the developer will control the quality of landscaping soils – see <b>Section 5.1</b>
		Humans – Neighbours	Unlikely	-
		Property – Built Environment: Future structures	Unlikely that that exposure to contaminants listed would result in significant deterioration of buried concrete/piles	-
		Property - Flora / Fauna: Crops	Unlikely – crops will not be grown	-
		Surface Water: River Rother	<b>See PPL 1b&amp;c</b>	<b>See PPL 1b&amp;c</b>
		Groundwater: Secondary Aquifer, flow towards River Rother) No potable groundwater abstractions between site and river.		
		Ecosystems	Unlikely – none present within a reasonable distance from the site	-

Source / Area of Concern	Contaminant(s)	Receptors	Likelihood of PPL Forming & Comment on Consequence	Next Step in Procedure
<b>Source 5: Hazardous Gases</b> - naturally occurring methane, carbon dioxide and perhaps others hazardous gases from within the alluvium associated with the river valley which may contain organic matter and peat.	Hazardous gases (e.g. methane)	Humans – Inside the train: Future workers & visitors	Unlikely – humans in the train should have insignificant exposure.	
		Humans – Outdoors: Future workers & visitors	Unlikely given diffusion to atmosphere	-
		Humans – Neighbours	Unlikely to be significantly impacted by on Site sources	-
		Property – Built Environment: Future structures	<b>PPL 5:</b> Potential explosion risk from build-up of gases / vapours under / within any structures (especially electrical cupboards / rooms)	<b>PPL 5:</b> Further Investigation & Assessment – see <b>Section 4.3</b>
		Property - Flora / Fauna: Crops	Unlikely – crops will not be grown on site	-
		Surface Water: River Rother	<b>See PPL 1b&amp;c</b>	<b>See PPL 1b&amp;c</b>
		Groundwater: Secondary Aquifer, flow towards River Rother) No potable groundwater abstractions between site and river.		
		Ecosystems	Unlikely – none present within a reasonable distance from the site	-

Source / Area of Concern	Contaminant(s)	Receptors	Likelihood of PPL Forming & Comment on Consequence	Next Step in Procedure
<b>Source 6</b> - Unidentified Contaminant Sources	Unknown	All Receptors	<b>PPL 6:</b> Potential Harm to Health or the Environment from Unidentified Contaminant Sources – Exposure Mechanism Unknown.	<b>PPL 6:</b> If Needed - Voluntary Remedial Action – see <b>Section 5.2</b>

#### **4.0 FURTHER INVESTIGATION AND ASSESSMENT**

This PLQRA has allowed the development of an outline conceptual model. Normally SLR would recommend investigation of PPLs without further desk based / preliminary research, but in this case it is our opinion that intrusive work should be preceded by a second stage of data gathering with the subsequent review of information being used to improve the conceptual model.

We have come to this conclusion as there is likely much to be gained by visually inspecting the proposed route, researching the old line (to establish the locations of transformers and alike if possible) and gaining a detailed understanding of the construction plans.

The second stage should enable an assessor to produce a more detailed conceptual model of ground conditions, and seems to be the most sensible approach as it should allow RVR's application to proceed with minimal land quality fieldwork.

From the list of PPL identified in Section 3, PPL1, PPL2, PPL3 and PPL5 will require further investigation if the enhancement of the conceptual model does not rule them out or allow the developer to volunteer protective measures.

PPL 4 and PPL5 are discussed in **Section 5**.

##### **4.1 Health - PPL 1a, PPL2a & PPL3**

*Potential Harm to Human Health Outdoors from Exposure to PCBs in the Ground Adjacent to / under Previous Transformer Locations*

*Potential Harm to Human Health Outdoors from Exposure to Various Contaminants held in Historic Wastes within Embankments / Ballast*

*Potential Harm to Human Health Outdoors from Exposure to Various Contaminants held in Contaminated Ballast*

These PPL concern potentially harmful ground conditions at the site of historic transformer locations, across embankments (if waste was used as a construction material), and across areas of historically contaminated ballast (if present). There is no certainty with respect to the presence or location of such features within the land to be developed and further visual inspection and desk based investigation is recommended.

If old transformer sites, evidence of the use of waste or historic contamination is identified, SLR recommends an intrusive investigation to allow the developer to take account of the chemistry of soils, so that they may make an informed decision about the need for remedial works.

If no old transformer sites, etc are identified, SLR recommends modification of the conceptual model with deletion of associated PPL.

##### **4.2 Controlled Waters - PPL 1b&c**

*Potential Pollution of Surface Water and Groundwater by Various Contaminants in Made Ground*

These PPL concern ground conditions across the site and the possibility of soluble contaminants migrating laterally via groundwater to the surface water within the River Rother.

SLR recommends regulatory liaison with RDC and the Environment Agency and acquisition of surface water quality monitoring records, not least as given a 55 year interval it seems extremely unlikely that significant pollution continues. Subject to the findings of the extended research an intrusive investigation and / or environmental monitoring is recommended to provide the scheme's environmental consultant with information regarding soil and groundwater chemistry.

The results of any investigation should be used to inform generic risk assessments, detailed quantitative risk assessment may follow if required.

#### **4.3 Property - PPL 2b and PPL5**

##### *Potential Damage to Future Structures from Exposure to Aggressive Ground*

##### *Potential for Harm to Health and Building Damage from Hazardous Gases*

These PPL concern ground conditions across the area of all proposed ground bearing foundations.

Subject to the findings of the extended research, SLR recommends an intrusive investigation and environmental monitoring to provide the scheme's environmental consultant and (foundation) designers with information regarding aggressive ground conditions and hazardous gases / vapours. The information should take regard of guidance provided by the BRE in Special Digest 1 Concrete in Aggressive Ground, and the various guidance documents available with respect to hazardous gases / vapours and potential mitigation measures.

## 5.0 VOLUNTARY PREVENTATIVE AND REMEDIAL ACTIONS AND VALIDATION OF THOSE WORKS

### 5.1 Voluntary Preventative Action to Avoid PPL 4

#### *Potential Harm to Human Health from Potential Contaminants in Landscaping Soils*

SLR recommends that the developer offer to ensure that landscaping soils (especially those placed in public access areas) meet a soft landscape specification. Example specification wording:

*“Do not use fill materials which would, either in themselves or in combination with other materials or groundwater, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:*

- *frozen or containing ice;*
- *organic;*
- *contaminated or noxious;*
- *susceptible to spontaneous combustion;*
- *likely to erode or decay and cause voids;*
- *with excessive moisture content, slurry, mud or from marshes or bogs;*
- *clay of liquid limit exceeding 80 and/or plasticity index exceeding 55; or*
- *unacceptable, class U2 as defined in the Highways Agency 'Specification for Highway works', clause 601”.*

The specification should also sets out how the sub-soil should be prepared and placed to a level allowing the later addition of:

- 150mm of topsoil – grassed areas; and
- 450mm of topsoil – shrub planting areas.

In terms of quality, site-won (or imported) topsoil should be tested for compliance with BS 3882:2007<sup>7</sup>, and compost tested against BSI PAS100.

Tree pits should be a minimum of 1,200mm diameter and 1,000 mm deep or allow 300mm clearance between the rootball and the edge of the pit.

The regulator may require some documentary evidence that the landscaping specification is followed, and beyond that may require evidence that the chemical composition of any growing media / soil is suitable for use. It is for RVR or their representative to liaise with LBTH on this matter.

In advance of that liaison, it is thought likely the developer or their representative will need to:

- obtain chemical test certificates of proposed landscaping materials and compare the results of the analyses to soil guideline values or (generic) health risk assessment criteria applicable to a the proposed land use(s)
- arrange for a UKAS and MCERTS accredited laboratory to test samples of the materials:
  - at a rate to be agreed with RDC; and for

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<sup>7</sup> Specification for topsoil and requirements for use  
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- an analysis suite agreed by RDC (most likely comprising CLEA metals, speciated total petroleum hydrocarbons, speciated polycyclic aromatic hydrocarbons, pH and soil organic matter);
- arrange for additional samples (beyond those pre-agreed with RDC) to be collected and tested should any uncertainty arise as to the quality and / or origin of material brought onto site; and
- prepare and submit to RDC a Land Quality Validation Report to demonstrate that suitable materials were placed - see **Section 5.3**.

## **5.2 If Needed - Voluntary Remedial Action to Break PPL 6**

### *Potential Risks to Health or the Environment from Unidentified Sources*

SLR has advised RVR that RDC may use a planning condition whereby the developer must set forward voluntary additional measures to deal with any contamination (beyond that contamination previously identified) encountered as part of the redevelopment.

In practise, should the developer encounter potentially hazardous materials work should cease and the matter be referred to an appropriate environmental consultant.

Any remedial actions should be agreed with RDC and recorded in the Land Quality Validation Report - see **Section 5.3**.

## **5.3 Land Quality / Remedial Works Validation Report**

Any remedial works will follow a period of liaison with RDC in which final details of the remedial scheme will be agreed. RDC may or may not want to be informed of progress during the remedial works, but the regulator will require a report shortly after the remedial works are complete. The Land Quality Validation Report, which should be submitted to RDC with an application to discharge the relevant condition, should:

- set out which organisations have been responsible for implementing and supervising the remedial works (any environmental consultant used should be suitably experienced and operate under an externally accredited quality assurance scheme e.g. ISO9001).
- provide the results of any inspection for contaminants and the remedial scheme;
- provide details for the suppliers of imported soils (if any);
- present chemical test certificates (from the supplier);
- make reference to the health risk assessment carried out prior to soil placement (or import) and the scope of quality assurance works agreed with RDC (criteria & frequencies);
- present the results of laboratory tests on imported materials showing that:
  - the rate agreed with RDC was observed; and that
  - the analysis suite agreed by RDC was carried out;
- present the results of any additional testing (beyond that agreed with RDC);
- demonstrate that quality assurance procedures relevant to soil sampling, storage and testing were complied with (including the use of accredited laboratories and, where possible, the use of MCERTS testing methods);
- form a record of the remedial activities (and any changes to the remedial design) using as-built drawings, progress photographs, etc; and
- set out any additional remedial measures volunteered to deal with contamination (beyond that previously identified) encountered as part of the redevelopment.

## **6.0 CLOSURE**

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client.

Information reported herein is based on the interpretation of data collected from various sources which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Temple Group Limited; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.









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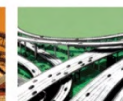
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