Environmental Statement Addendum

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LEADERS IN ENVIRONMENT, PLANNING & SUSTAINABILITY.

Report for – Rother Valley Railway Limited
Track Reinstatement between Northbridge Street and Junction Road
Environmental Statement - Addendum

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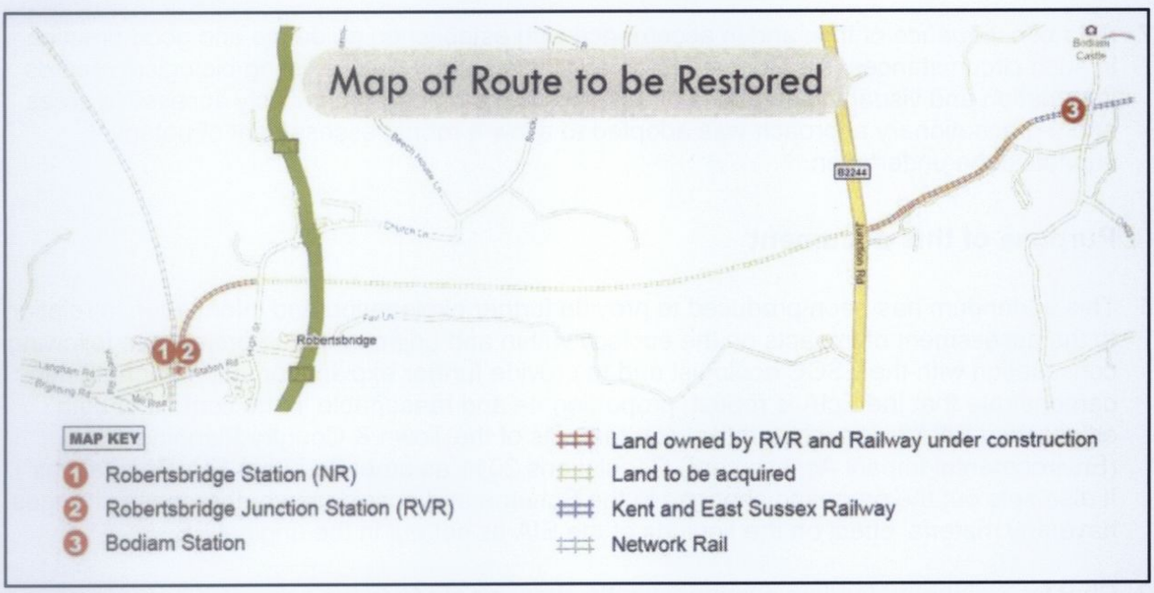
1.0 Introduction

1.1 Background

1.1.1 Rother Valley Railway (RVR) submitted a planning application to Rother District Council in June 2014 for the reinstatement of a section of the Kent and East Sussex Railway (KESR) between the B2244 Junction Road and Northbridge Street, Robertsbridge, a distance of approximately 3.4 km. The application was accompanied by an Environmental Statement (ES) which reported the findings of a detailed Environmental Impact Assessment (EIA) undertaken for the project. The planning application reference is RR/2014/1608/P.

1.1.2 The location of the route is shown in **Figure 1.**

Figure 1: Plan showing section of the route to be restored



1.1.3 Since submission of the ES, changes to scheme design have been proposed and supplementary ecology information made available at the request of the East Sussex County Council ecologist. A summary of these changes is set out in Chapter 2.

1.1.4 As part of the Environmental Impact Assessment (EIA), these relatively minor revisions need to be reviewed to assess whether the changes are likely to result in any material changes (changes in the magnitude of impacts that may lead to a change in the assessment of significance of effects) of the Scheme.

1.1.5 The EIA was undertaken in accordance with a Scoping Report dated October 2014. Chapter 7 of that Scoping Report was concerned with ecology and nature conservation and described the proposed methodology and scope for assessment of the potential impacts and associated effects of the railway development on ecological resources and receptors, taking into account that it was not possible to secure access to those areas of the development site in third party ownership. A Scoping Opinion was issued by Rother District Council in January 2014. The EIA assumed the worst-case scenario in terms of environmental effects where applicable.

1.1.6 The EIA included an Ecological Impact Assessment (EcIA) to address the potential impacts of the project on known and potential habitats and species (including protected species). As anticipated in the Scoping Report, the EcIA was constrained from the outset by the refusal of the three directly affected landowners to allow access to their land for the purposes of undertaking ecological (and other) surveys, to establish the environmental baseline and inform the assessment of impacts and development of any necessary mitigation measures.

1.1.7 As a consequence of this, and in accordance with established guidance and good practice in such circumstances, the EcIA relied on available survey data, existing biological records information and visual observations of the project site made from publicly accessible areas and a precautionary approach was adopted to allow a robust assessment of potential impacts to be undertaken.

1.2 Purpose of this document

1.2.1 This addendum has been produced to provide further explanation and information in relation to the assessment of impacts on the ecology within and adjacent to the project site following consultation with the ESCC ecologist and to provide further explanation and information to demonstrate that the EcIA is robust, proportionate and reasonable in the context of both established EcIA guidance and the requirements of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011 as amended (the "EIA Regulations"). It also sets out the proposed changes to the Scheme and considers whether these changes have any material effect on the findings of the EIA as set out in the original ES.

1.2.2 Chapter 2 of the addendum summarises the changes made to the scheme design which relate primarily to the lowering of the railway embankment and the number and type of watercourse crossings and culverts beneath it.

1.2.3 Chapter 3 of the addendum deals with the various issues raised with regards to ecology. It reproduces text from paragraphs in the original ES with accompanying explanatory text to provide increased clarity on specific points.

1.2.4 Chapter 4 of the addendum provides further information in relation to the assessment of ecology impacts.

1.2.5 Chapter 5 provides an ecological narrative and overview on the likely impacts to ecological receptors arising from lowering of the embankment and the design of crossings e.g. bridges and culverts, in response to discussions with the Environment Agency on flood risk and subsequent further hydraulic modelling.

1.2.6 Chapter 6 provides an update on changes to the other topic assessments arising from the changes to the scheme design and draws conclusions as to the significance of impacts.

1.2.7 This addendum should be read in conjunction with the original ES and in particular, the ecology assessment (Chapter 9).

1.2.8 Appendix A of this addendum also provides the updated Flood Risk Assessment (FRA) produced by Capita.

2.0 Summary of changes to the Scheme design

2.1.1 The changes to scheme design proposed by Rother Valley Railway include the lowering of the embankment between the A21 crossing and Salehurst and changes to bridges and culverts mainly resulting from lowering the embankment.

2.1.2 All changes to scheme design will be further described in Section 5 (Potential effects of revised Scheme design on ecology) and taken into consideration in Section 6 (Changes to environmental topic assessments).

2.1.3 The farm accesses along the Scheme remain the same as assessed in the ES.

3.0 Clarification of Ecology Issues

3.1 Methodology: Significance of Effect

3.1.1 Paragraph 4.5.2 of the ES stated:

*For some disciplines a variation of the matrix shown in **Table 4.1** may be used. Where this is the case, the methodology used is explained in the relevant discipline chapter.*

3.1.2 The ecology assessment used a variation of this methodology and this was reproduced in the relevant section under Paragraph 9.2.11, 9.2.12 and Table 9.3. The methodology used is based on the 2006 published guidance from the IEEM[1] and represented the industry standard for ecological impact assessment that was current at the time of writing. The table of assumptions in the ecology chapter (Table 9.4) provided the information used to determine the magnitude of impact and the geographical level on each receptor and the assessment of significance.

3.1.3 Paragraph 4.5.3 stated:

In addition, the assessed effect may be adjusted from that shown by the matrix based on professional judgement or other qualitative criteria, where appropriate. Where such changes are made, the justification for them is explained in the text.

3.1.4 As with other aspects, the precautionary (assumed reasonable worst case) approach was followed and a higher level of significance determined than might otherwise have been applied. Again, this is in line with best practice, particularly in circumstances where there is limited or no access to land to enable detailed surveys to be undertaken.

3.2 Identification of Important Ecological Features

3.2.1 Paragraph 9.2.4 stated:

Due to the lack of direct access the identification of receptors has come through the use of: existing data, feedback from consultees and from expert judgement. Assumptions have been made to assess the presence/absence, distribution and abundance of habitats and legally protected species (see Table 9.4).

3.2.2 The approach outlined in the ES was implemented due to the restriction on direct land access for survey for land outside RVR's control. The assumptions used are robust and based on the professional judgement of the qualified ecologist involved (who had local knowledge of the area), with support from senior ecologists at The Ecology Consultancy. Table 9.4 was also informed by the results of a data search with the environmental records centre, existing ecology studies of the immediate local area and the known habitat requirements for those legally protected species that may reasonably be expected to be present within the site.

[1] Institute for Ecology and Environmental Management (2006). Guidelines for Ecological Impact Assessment in the UK and Ireland. IEEM.

3.2.3 It should be noted that since the ES was produced revised guidelines on impact assessment have been published by the CIEEM[2] (2016).

3.2.4 Section 3.12 of the current guidance document on ecological impact assessment (CIEEM, 2016) states that '……. *or there are other substantive limitations to the data collected, further information may be needed to ensure that the EcIA is robust. If it is not feasible to gain access to land beyond the project site, it may be possible to undertake a basic survey from public highways or other accessible public spaces. The considerable limitations of this type of survey and the influence on confidence in the conclusions should be assessed and reported. Where feasible, survey limitations should be addressed at a later date: for example if access to private land can be gained, survey findings should be updated'.*

3.2.5 The baseline Phase 1 habitat information for the project by necessity had to follow the approach highlighted above, with the site viewed remotely from Pubic Rights of Way (PROW). As is recommended in section 6.7 of British Standard BS42020: 2013 'Biodiversity - Code of Practice for Planning & Development', the limitations to this method of establishing Phase 1 habitat types were acknowledged in the ecology chapter and the assessment methodology was based on a precautionary worst case principle as outlined in 3.1.4 Prior to any construction works on the site the habitat types will be confirmed through direct survey to inform the ecological management proposals so as to ensure that mitigation and compensation measures are relevant and appropriate.

3.2.6 This approach is not without precedent. For example, there are a number of much longer sections of the proposed High Speed 2 (HS2) rail line route where there is no ecological baseline information because landowners refused access for surveys during the EIA. Subsequently, the ecological impact assessment similarly adopted a precautionary approach and, as with this ES, the presence of legally protected species was assumed wherever habitat was considered likely to be suitable.

3.2.7 Paragraph 9.2.5 of the ES stated:

Identification of all statutory sites which may be indirectly affected by the Scheme was undertaken at the initial desk study stage through interrogating the data sets held on Defra's MAGIC Map website.

3.2.8 No statutory sites designated for their nature conservation interest were located close enough to the proposed works area to be reasonably likely to be impacted by either the construction or operational stages of the Rother Valley Railway project. It should be noted that Darwell Wood Site of Special Scientific Interest (SSSI) is approximately 4.5km from the project site in contrast to the 6.9km quoted in the ES. However, this reduction in distance is unlikely to affect the assessment of no significant effect as it is still sufficiently distant from the project site, and the nature of the proposed works is such, that ecological impacts would not reasonably be expected.

[2] The Institute of Ecology and Environmental Management (IEEM) has since been granted a Royal Charter. The new Charter was enacted on 1 April 2013, from which date they became the Chartered Institute of Ecology and Environmental Management (CIEEM)

3.2.9 In the time that has elapsed since the ES was written Natural England has launched the use of Impact Risk Zones (IRZ) for SSSIs. These are a tool to prompt local authorities assessing planning applications to consult Natural England about any likely impacts arising from schemes that meet the published criteria for possible impact. It is worth noting that, although the proposed scheme does now fall within an IRZ for Darwell Wood, it does not meet the criteria for consultation.[3]

3.3 Identification of the level of importance of the feature

3.3.1 Paragraph 9.2.6 of the ES stated:

Professional judgement was used to allocate a level of importance to each feature identified within the site and zone of influence in relation to the total resource at a given geographical scale, and taking account of its legal and policy status. Evaluation of each feature's importance has taken account of:

- *CIEEM guidance on evaluation;*
- *Legislative and regulatory lists (e.g. Wildlife and Countryside Act 1981 (as amended) Schedules, and Habitats Directive Annexes);*
- *Species and Habitats of Principal Importance for Biodiversity, Section 41 NERC Act/Biodiversity Action Plan (BAP) lists;*
- *Local context;*
- *County floras; and*
- *National inventory for ancient semi-natural woodland (ASNW).*

3.3.2 This represents the accepted standard methodology for assessing importance with each element contributing to the final assessment. The evaluation of importance has followed the same process as would usually and reasonably be expected and is no less robust when based on a set of assumptions than direct survey data, as both approaches are used to identify the receptors that are, or may be, present.

3.4 Predicted Effects

3.4.1 Paragraph 9.4.3 stated:

The assessment is based solely on a set of precautionary assumptions regarding presence/absence distribution and population size and will be confirmed or re-drafted once full data is available.

3.4.2 This does not imply that the assessment reported in the ES is not robust. The ecological impact assessment was based on the highest level of information that could reasonably be expected to be gathered at the time.

[3] In this case triggered by the following: Airports, helipads and other aviation proposals/ Pig & poultry units, slurry lagoons > 750m³ & manure stores > 3500t.

3.4.3 Ecological receptors, by their very nature, change and move. Depending upon the receptor, this may frequently occur over even short periods of time. Therefore, every ES necessarily makes some assumptions regarding presence and distribution, even where access enables appropriate efforts to be made to collate a complete baseline. In this case, the precautionary assumptions in the ES were defined by ecologists with a sufficient level of knowledge of the receptors concerned and were based on the precautionary approach. It should be noted that while it will be necessary to carry out surveys to inform the appropriate level of ecological mitigation and (if necessary) compensation required, the intention is not to repeat the impact assessment but rather to provide confirmation that the precautionary approach and the mitigation measures proposed remain valid.

3.5 Mitigation

3.5.1 Paragraph 9.5.3 of the ES stated:

An Ecological Mitigation Plan will be produced to guide all potentially disturbing works but all final mitigation measures will only be agreed and designed once all of the necessary surveys have been completed and necessary European Protected Species Mitigation licences have been obtained from Natural England.

3.5.2 This follows the guidance for mitigating impacts of construction set out in BS42020. It is an approach that allows for mitigation to be devised in much greater detail in the run up to construction than could reasonably be expected to be done in the pre-planning stage. It is only once a development has surety of occurrence that finer detail is developed for engineering and architecture, with ecological mitigation measures being finalised during this process. However, in line with case law and established best practice in EIA, the ES has established and assessed the main design parameters of the proposed scheme (the "Rochdale Envelope") to provide assurance to the planning authority that the environmental impacts of the final detailed design will be no worse than predicted in the ES.

3.5.3 The fine details of any European Protected Species Mitigation (EPSM) licensing that may be required will be developed in tandem with the Ecological Mitigation Plan (EMP), which will be conditioned under the planning consent. The licences themselves can only be granted by Natural England if up to date survey information is used. Even for developments where the ES was informed by baseline surveys, it is commonplace for those surveys to be repeated/updated prior to construction due to the time that frequently elapses from the initial studies to the granting of planning permission.

3.6 Conclusions

3.6.1 Paragraph 9.7.1 stated:

The base line and subsequent impact assessment of this scheme have been based on a series of assumptions and will be revisited in full once comprehensive base line data has been gathered.

3.6.2 The intention here is not that the impact assessment will be revisited in full but rather that data will be gathered to inform and confirm the proposed mitigation measures in the EMP and to meet the requirements of any necessary EPSM licences (as described in paragraph 2.5.3 above).

4.0 Further information in relation to ecology assessment

4.1.1 The following paragraphs contain additional explanation and information in relation to the assessment of ecology. Also provided are some minor amendments to the contents of the Table of Assumptions and regarding the likely presence and abundance of badgers and Schedule 1 birds. Also provided is some additional information regarding proposed mitigation for any badger setts which may later be found within the footprint of construction of the rail corridor

4.2 Age of survey data

4.2.1 Although the survey data relied upon in the ecological assessment in the environmental statement was collected in July 2013 and is therefore on the limit of what might be considered as suitably up to date, it should be pointed out that the majority of the baseline is informed by the precautionary approach and based on assumptions regarding the presence of protected species and habitat types, and would therefore not be time limited in the same way as original survey data. As noted in Chapter 2 of this addendum, detailed surveys will be required to inform any detailed mitigation measures and the preparation of EPSM licenses if required, in line with established practice.

4.3 Detail on levels of access

4.3.1 The following information is intended to clarify where the project site was viewed remotely for the purposes of the ecology assessment in the ES and to demonstrate that the assessment was suitably robust. Volume 3, Appendix 3 of the ES contains the original survey report produced by CLM, *Ecological Appraisal Rother Valley Railway Track Reinstatement between Northbridge Street and Junction Rd* (Macdonald, 2013). In Appendix 2, page 16 of that report there is a plan that illustrates the access including a blue line running along the Public Right of Way (PROW) used by the surveyor. In Appendix 4, page 18 of that report, there are a series of photographs that also provide some illustration and support for the surveyor's interpretation of habitats and protected species potential along the route.

4.4 Consistency of the report

4.4.1 There is a slight inconsistency within the ES in regards population class sizes for great crested newts. Table 9.4 takes a more precautionary approach to assume a High population than the previous list of assumptions. Newt population class sizes are taken to be:

- Small for maximum counts of to 10
- Medium for maximum counts between 11 and 100
- Large for maximum counts over 100

4.4.2 The difference between medium and high/large population size class is on a lower scale than from small to large. While the inconsistency is acknowledged, it is not considered to reduce the robustness of the assessment; the least precautionary approach, a medium population in each pond, still assumes the presence of a greater number of individuals, i.e. up to 100 in each pond, than is commonplace or possibly realistic.

4.4.3 Habitat mitigation and compensation measures would be unlikely to vary significantly between medium and high population class sizes, although practical mitigation e.g. translocation effort, would extend to a default 90 nights capture as compared to the 60 nights required for a medium population. It should be noted that these are minimum capture periods and if a high/large population were to be encountered trapping would continue to 90 nights or more until all animals have been caught.

4.4.4 For the purposes of the ES however, this level of detail is generally not provided but only devised during the later stages when an EPSM license is applied for.

4.5 Evidence to support assumptions

4.5.1 Since the original ES was prepared, a survey of Moat Farm undertaken in 2015 (Sussex Biodiversity Record Centre) reported the presence of species rich grassland in the area which would provide ideal habitat for Barn Owl (*Tyto alba*), a Schedule 1 species. Given the habitats present, the site has potential to support farmland and wetland birds, including ground nesters, all of which have the potential to be impacted by the proposed development, depending on the nature of the works required. It should therefore be assumed for the purposes of the ecological impact assessment that barn owl is likely to be present within and along the proposed route and the scheme assumes the presence of a wider suite of species, including but not limited to: barn owl (Schedule 1), kingfisher (Schedule 1), lapwing, meadow pipit and skylark.

4.5.2 The proposed mitigation outlined in paragraph 9.511 and 9.512 of the ES covers the creation of compensatory wetland which would be of benefit for lapwing and other wetland species and potentially for kingfisher. Final landscaping design of such features will be targeted to provide habitat for those species subsequently recorded once land access has been granted.

4.6 Protected species licencing

4.6.1 It is assumed that several European Protected Species (great crested newts, bats, dormice and otters) are present on site and could be impacted by the scheme. Therefore, the proposed works may require European Protected Species mitigation licences. Works that could impact badgers will require a licence under the Protection of Badgers Act 1992. It is anticipated that Natural England will require up to date surveys and appropriate schemes of mitigation measures in order to issue such licences. Indeed, any European Protected Species Mitigation (EPSM) licence will require up to date surveys to ensure that mitigation and compensation measures are appropriate for the current ecological baseline. These will be carried out at the appropriate time and to industry standards. It is established practice on projects, even of this limited scale, for repeat ecology surveys to be undertaken post-planning approval to verify the baseline and inform EPSM licence applications that are completed after planning consent has been granted.

4.7 Badger distribution

4.7.1 Whilst no information is provided on badger distribution, the presence of a least one sett was assumed in the ES. This assumption was based on habitat type and a report, current at the time, produced by the People's Trust for Endangered Species (PTES) on the UK badger population[4].

4.7.2 A more recent study is now available and has demonstrated a significant rise (103%) in the number badger social groups in England[5] and therefore a commensurate increase should be assumed for the proposed route of the Rother Valley Railway.

4.7.3 The number of badger setts now assumed to be present and active within the rail corridor is two main setts and four outlier sets, this has been revised upwards since the submission of the environmental statement and takes greater account of the higher value and suitability of habitat provided by wooded rail embankments. The topography and vegetation cover found particularly along disused rail lines provide ideal locations for sett building combined with foraging resources. Additional information on mitigations is provided in Section 3.7.4 of this addendum report.

4.8 Badger mitigation

4.8.1 The following text is intended to explain the rationale supporting the proposed badger mitigation in chapter 9 of the ES.

4.8.2 It is stated in paragraph 9.3.47 of the original ES that the remainder of the extant embankment has a very high likelihood of supporting setts and that it should be assumed that there is at least one main sett along the length of the proposed route plus numerous outlying setts. Natural England's standing advice is that if setts need to be destroyed or badgers otherwise need to be excluded temporarily or permanently from their setts (activities which will require a licence), then the availability of suitable alternative setts should be confirmed through survey. Where this cannot be confirmed, an artificial sett may need to be constructed as close to the original as possible, particularly for main setts (those which are in continuous occupation and form the primary residence of a "social group" of badgers). Artificial setts should only be considered as an option of last resort, as natural setts are usually favoured over artificial ones. The use of artificial setts as mitigation measures has been a long established and effective practice but is usually only undertaken when a main sett is permanently lost. It is likely that works that may cause only temporary disturbance to a main sett would still result in the permanent loss of that sett due to the potential perturbation effect on that social group. In the event that it is necessary to provide an artificial sett, Natural England will usually require that such new sett has been taken up and in use by badgers prior to the start of their exclusion from the existing site. Any replacement sett(s) that may be required will therefore be constructed as soon as reasonably practicable and in accordance with good practice and Natural England's requirements.

[4] Wilson, Harris and MacLean (1997) *Changes in the British Badger Population*. Peoples Trust for Endangered Species, London.

[5] Johanna Judge, Gavin J. Wilson, Roy Macarthur, Richard J. Delahay (2014) *Density and abundance of badger social groups in England and Wales in 2011 -2013*. Nature.

4.8.3 The assumptions that the scheme now follows with regards to badgers is that there will be two main setts and four outlier setts located within the construction footprint and working corridor. The following approach will be implemented:

- There is a presumption that any setts will remain in-situ and be protected from disturbance, unless a sett;
  - lies directly within or adjacent to the proposed ballast/running rails;
  - is likely to cause structural instability of an embankment adjacent to the running rails;
  - is directly within or adjacent to land that will be impacted by construction activities including any haul roads.
- In any of the instances listed above a licence will be obtained from Natural England for affected setts to be closed either permanently or just for the duration of construction. Any setts that are permanently closed will be excavated out under a watching brief and under the supervision of an experienced and licensed badger ecologist. Badgers will be excluded from any setts that may be causing structural problems on embankments but the sett workings left in-situ and secured through rendering and/or other slope stabilisation technique.

4.9 Spatial scope and construction footprint

4.9.1 An updated data search has been commissioned from the Sussex Biodiversity Records Centre (SxBRC) to locate any new reports, such as the survey for Moat Farm, which may have become available since the ES was published in 2014. The presence of species rich grassland in the area has been unofficially communicated to The Ecology Consultancy by Natural England. It is an accepted premise of this ES that a full suite of surveys will be carried out to inform the detailed development of mitigation, compensation and enhancement measures once access is available. This will include an updated Ecological Impact Assessment (EcIA) not necessarily within a new ES, which must be based on detailed engineering proposals.

4.10 Dormouse mitigation

4.10.1 Best practise is not to capture dormice but should instead be based on the following:

- November - February first year access - felling of trees and shrubs will need to be undertaken during the winter to avoid potential impacts on breeding birds (as detailed below). Tree stumps should be retained as these are potential dormouse (and reptile) hibernation sites.
- May - October following felling - Tree stumps can be removed from May onwards. Clearance of scrub habitat may also commence at this time and continue until June; however there is a possible conflict with breeding birds. Clearance of scrub habitat will need to be undertaken over successive days, with no more than 20 metres per day cleared. Clearance of scrub will need to be undertaken by hand under ecological watching brief. Work should commence in one corner of the site and vegetation should be progressively cleared to the opposing corner. If work is postponed due to the presence of breeding birds, it would need to be rescheduled until September/October to avoid the risk of separating dormice from dependent young.

- Monitoring - The site will need to be monitored for dormice for at least five years. Monitoring will need to be undertaken by a licenced dormouse ecologist. Installation of dormouse boxes in woodland outside of the developable area as well as in the buffer zone could also form part of the monitoring for any EPSM licence for the site

4.11 Importance assessment methodology

4.11.1 The evaluation section of the ES has followed accepted guidance (IEEM, 2006) in terms of the process of valuing any important ecological features and that process has been based on the series of assumptions previously mentioned.

4.11.2 The level of importance of the site as a whole and the relative nature conservation value of individual ecological features cannot be properly determined until an accurate and not assumed, baseline is available. The ecology chapter of the ES is at present a 'broad brush' and must be refined once full data is available. This is not a unique approach and is regularly adopted, particularly on larger schemes where access to all relevant land is unlikely or not possible during the EIA stage.

4.11.3 It is a regularly encountered occurrence that there are competing mitigation requirements for a variety of species and habitats on a single site. The major conflict is often timing of works but whilst this can be a problematic scenario it is generally easily surmountable with sufficient experience and forward planning. The nature and scale of the proposed railway reinstatement is not particularly complex and therefore timing of works is unlikely to pose significant problems in terms of implementing mitigation.

4.12 European Protected Species

4.12.1 The assumptions set out in the ES are based on a precautionary approach. Where habitat is suitable to support an important ecological feature it is assumed that the relevant species is present, with a large population size. The assessment of the scheme's impact on the favourable conservation status (FCS) of any specified species (or habitat) is therefore valid and accurate. The potential for a population to be smaller in reality than that assumed has little or no bearing on the factors that are important to maintaining FCS, e.g. access to food, shelter, limited predation and so on and therefore the assessment conclusions are robust. Mitigation measures have also been developed on this basis.

4.12.2 As set out in paragraphs 2.5.2 and 2.5.3, the mitigation for European Protected Species and any accompanying licensing must be based on up to date and comprehensive survey data and it is expected that detailed surveys will be undertaken post-consent to inform this once land access is confirmed.

5.0 Potential effects of revised Scheme design on ecology

5.1.1 There have been a number of revisions to the basic design of the watercourse crossings since the ES was compiled. The changes have included a new crossing (Bridge 22), changes from box culverts and single pipe culverts to multiple smaller bore pipes due primarily to the lowering of the rail embankments. Some of these revisions have implications for the likely impacts to water vole and otter through changes to hydrology (e.g. mean and flood water levels) and potentially fragmentation caused by hindering passage. The following paragraphs provide a summary narrative on the likely impacts and provide outline recommendations for mitigating those impacts should any riparian mammals be found during later surveys.

5.1.2 The latest Flood Risk Assessment (Capita, 2016) indicates that an increase in flood risk is negligible (see Appendix A).

5.1.3 The revisions to the design of the scheme have been driven by a requirement from the Environment Agency to ensure that there would be no significant effect on local flood levels from a 1:100 year +cc flood event. After detailed flood risk modelling looking at a wide range of possible permutations of design the final layout includes significant lowering of the rail embankments, for some sections in excess of 500m in length. The latter allowing flood waters to over-top the embankments as levels rise above a critical datum. Lowering the embankments has thereby necessitated the use of smaller (1.5m) diameter culvert pipes with culverts installed in new locations to provide additional flood alleviation features.

5.1.4 Where those culverts do not intersect with existing drainage ditches they are designed solely to accommodate flood waters. In this instance the smaller bore pipes are still sufficiently large enough to accommodate the passage of small mammal species and badgers. The Design Manual for Roads and Bridges (DMRB) Volume10 provides a minimum guide of a Class M 600mm pipe or a Class H 1050mm diameter concrete pipe for use by multiple species. In practise, badgers are unlikely to use these features unless accompanied by the use of guide fencing that is buried into the ground and are more likely to cross over the rail line. No additional impacts to badgers are anticipated due to the proposed day time only running. These additional culverts are anticipated to provide a net beneficial impact above the previous scheme by facilitating movement of small mammals, reptiles and amphibians. Impact: **minor beneficial**.

5.1.5 In locations where culverts were already proposed but have been changed to multiple smaller bore pipes from 5m box culverts the impact is neutral.

5.1.6 Of the 24 changes to scheme crossing designs, only four of those crossing locations affect existing water courses.

5.1.7 Bridge 13, this structure was previously a 50m span formed of multiple pre-cast pipes, now a 30m span that crosses over an existing drainage ditch that runs down from Church Lane to join Mill Stream. This change in design is likely to result in a reduced impact from the original scheme by leaving the existing drainage channel open and unchanged. Impact: **positive beneficial**.

5.1.8 Culvert 18, a new 6m box culvert laid within an existing drain that drains fields to the south of Church Lane in Salehurst and joins with the River Rother. This culvert could directly impact water vole burrows during installation and fragment habitat for this species and for otters. Mitigation measures are standard and known to be effective. Prior to works a suitably qualified ecologist who holds a licence to displace water voles from Natural England would enact a series of measures designed to displace water voles out of the works area. This includes the use of coffer damns to drain the stream and intensive habitat manipulation to remove all vegetation from the stream and embankments. A dry pipe would be installed to sit adjacent to the west and 1m above the bottom line of the culvert. This feature would mitigate against fragmentation allowing passage from the northern section of the stream down to the River Rother. Impact after mitigation: **minor adverse**.

5.1.9 Culvert 20, this culvert will replace a short section of an extant culvert already in place to facilitate farm access across a drainage ditch. The use of smaller bore pipes reduces the suitability of this culvert for the passage of riparian mammals. During rainfall events there may be an increase in water height and speed of flow. Impact, **minor adverse**.

5.1.10 Bridge 24, previously a 3m box culvert the scheme has been revised to use a 13.4m span bridge which will cross over an existing pond located within a belt of scrub and woodland along the historic rail corridor. The Environmental Statement accepted the loss of this pond under the previous design and provided mitigation measures for great crested newts. The revision to the design will allow the majority of the pond to ne less impacted by construction and to remain during the operational phase. Due to shading this water feature would be sub-optimal for great crested newts but would still provide habitat for other amphibian species. Impact, **minor beneficial**.

6.0 Changes to environmental topic assessments

6.1.1 The objective of the EIA process is to identify the likely significant environmental effects resulting from construction or operation of the Proposed Scheme. The revised Scheme has therefore been reassessed looking at:

- Whether there are any previously identified significant effects which have changed in magnitude as a result of the revisions to the Proposed Scheme;
- Whether there should be a reconsideration of the significance of a predicted effect if the magnitude of an impact has changed; and
- Whether there is a new requirement for mitigation as a result of any change in the assessment of the significance of effect.

6.1.2 There are no additional topics to the ones previously assessed in the ES which need to be assessed as a result of the revisions to scheme design.

6.2 Noise and vibration

Construction noise and vibration

6.2.1 Based on information for likely construction activities, work locations, operational times, noise source data from BS 5228 and a number of assumptions; the ES predicted construction noise levels at nearby noise sensitive receptors. All noise modelling was carried out in accordance with the prediction methodology of BS 5228.

6.2.2 It was assumed that construction work would be confined to daytime periods only, with the exception of the construction of highway level-crossings which were expected to include some night-time working.

6.2.3 The construction works were not expected to generate continuous high levels of noise for the whole duration of the works given the Best Practicable Means (BPM) approach and the linear nature of the construction areas i.e. the works will only be at the closest approach to a particular receptor for a small part of the overall works programme.

6.2.4 The ES reported that the predicted construction noise levels would result in **Minor** to **Moderate** effects during peak times at the identified sensitive receptors. Furthermore, the assessment considered it unlikely that construction activities will generate significant levels of vibration at sensitive receptors due to piling. Therefore the construction phase vibration was assessed as **Negligible.**

6.2.5 Based on the information provided, it is anticipated that the predicted significant effects from construction noise levels identified in the ES will remain due to the use of similar construction activities, work locations and operational times to those reported in the ES.

Operational noise and vibration

6.2.6 The predicted operational noise levels reported in the ES were based on measurements of train pass-by events on the existing K&ESR line. The ES reported no significant effects due to operational noise levels. It is unlikely that, as a result of the scheme design changes, there will be any change to the **Negligible** effect at all receptors.

6.2.7 Due to the majority of vibration sensitive receptors being located more than 60m away from the new railway track, operational rail vibration effects were considered to be unlikely and therefore assessed as **Negligible**. As a result of the scheme design changes reported in **Chapter 3,** there are unlikely to be any changes to this assessment as part of the operational noise and vibration effects.

6.3 Air quality

6.3.1 As reported in the ES, dust emissions during demolition and construction activities have the potential to give rise to effects on sensitive locations such as residential properties. A qualitative assessment was undertaken to examine potential areas of concern and identify the BPM for eliminating, minimising and mitigating potential emissions.

6.3.2 There are few buildings and limited tall vegetation in the immediate vicinity of the proposed construction site and therefore any screening from dusty construction activities will be unlikely.

6.3.3 The traffic generated over the operational period is anticipated to be low and therefore no likely significant effect on local air quality as a result of operational train effects. It has also been assumed that a maximum of eight return train journeys are forecast per day and there are existing low pollutant background concentrations in the area, therefore the resulting emissions are considered to have a **Negligible** effect on local air quality.

6.3.4 Overall the ES reported that due to the deployment of fugitive dust mitigation on site and on transport routes, no significant residual dust effects are expected.

6.3.5 With the implementation of best practice measures on-site to minimise any nuisance impacts from fugitive dust during the construction phase of the Scheme, it is unlikely that there will be any changes to the level of significance reported in the ES as a result of the changes to scheme design.

6.4 Landscape and visual

6.4.1 In accordance with best practice, mitigation measures have been incorporated into the Scheme in order to reduce or remedy the any significant effects identified by the assessment. Consequently, the residual effects of the Scheme would not result in any significant adverse impacts. There is the potential for some of the impacts to progressively change from adverse to beneficial as the mitigation measures mature and become fully established.

6.4.2 The ES identified moderately significant residual effects at the following assessment locations:

- Assessment Viewpoint E (looking south east from Church Lane);
- Assessment Viewpoint F (looking south from field gateway on Church Lane, just west of Salehurst);
- Assessment Viewpoint G (looking south east from Public Footpath No.34c on eastern edge of Salehurst); and
- Assessment Viewpoint K (looking west from Public Footpath No.9 above Udiam Cottages).

6.4.3 While there are likely to be changes to landscape views as a result of the amendments to scheme design, with the addition of four bridges (Bridge 5A, Bridge 15, Bridge 16 and Bridge 17), these are not likely to result in any material changes to the significance of predicted landscape and visual impacts reported in the ES.

6.4.4 There are unlikely to be any changes to the landscape character assessment reported in the ES as a result of the changes to scheme design. The ES concluded that the landscape would not be degraded as a result of the Scheme due to the existing high level of woodland cover, and the ability of the proposals to retain the visually significant vegetation within the permanent land take of the Scheme.

6.5 Water quality, hydrology and hydrogeology

6.5.1 As reported in the ES, the construction of new bridge crossings and a replacement bridge has the potential to temporarily obstruct flows in the River Rother.

6.5.2 Assuming the contractor adheres to relevant best practice guidance, implemented through a Construction Environmental Management Plan, to minimise the effect of the construction and to reduce the risks of pollution to groundwater and surface water bodies, there are likely to be no predicted significant effects on the water environment during construction.

6.5.3 A detailed Flood Risk Assessment (FRA) was undertaken for the Scheme including modelling of river flows and the predicted extent of flooding of the new railway as well as the potential effects from the construction of new embankments and structures in the floodplain on flood risk upstream and downstream, including to properties in the vicinity. This has also been updated to take account of the changes to the Scheme and the new modelling has confirmed that flood risk will be reduced.

6.5.4 The ES reported a **moderate significant** adverse effect on an electrical substation and pumping station/electrical substation as a result of an increased risk of fluvial flooding to receptors in Robertsbridge.

6.5.5 As a result of the changes to the Scheme design and further design work, there are likely to be improvements to the previously reported flood risk impacts (details are in the FRA report).

6.6 Land quality

6.6.1 Following consultation with the Rother District Council Environmental Health Service, it was agreed with the Senior Environmental Health Officer that land quality matters could be 'scoped out' of the EIA. The Preliminary Land Quality Risk Assessment in Volume 3 of the ES considered the potential pollutant linkages (PPL), their significance and acceptability. No significant effects to land quality were reported as a result of the construction operation of the proposed Scheme.

6.6.2 As a result of the changes to the Scheme design, it is unlikely that there will be any material changes to the effects on land quality.

6.7 Archaeology and cultural heritage

6.7.1 The ES reported that, as a result of the construction of the new embankment, there would be a **moderate negative effect** on the setting of Robertsbridge Abbey. The impact would be generated during construction of the Scheme and would continue throughout its operational phase. The negative impacts are likely to lessen over time but not completely disappear during the operational phase. A reduction to moderate or slight significance is considered likely.

6.7.2 The loss of potential archaeological assets would be permanent, but compensated for by archaeological work and potential gains in knowledge about the local area and the wider area of the Weald.

6.7.3 With the removal of the previously assessed bridges 20, 21 and 22 as part of the revised Scheme, it is considered unlikely that there will be any material changes to archaeology and cultural heritage as a result of the Scheme design changes.

6.8 Transport and Access

6.8.1 The ES reported no significant residual effects as a result of the construction or operation of the Scheme.

6.8.2 Subject to implementation of the appropriate mitigation measures, as reported in the ES, it is considered unlikely that the revised Scheme will result in any significant material changes during construction or operation.

6.9 Socio-Economics

6.9.1 The ES reported no significant residual effects as a result of the construction or operation. The local socio-economic impacts of the Scheme would be minimal, though very marginally positive amongst certain receptors in the impact area. The benefits would arise from improved connectivity for inward tourism that would translate into a small increase in local jobs in this sector. There are likely to be minimal impacts to accessibility due to the level crossing.

6.9.2 It is considered unlikely that there will be any material changes as a result of the changes to Scheme design.

6.10 Land-use and Agriculture

6.10.1 As reported in the ES, construction of the railway line would require approximately 6.2 hectares, of which 2.7 hectares is Subgrade 3b. The loss of this land was reported to have an adverse effect of minor significance.

6.10.2 Assuming implementation of the proposed mitigation measures, this would reduce to a neutral or slight adverse significant effect.

6.10.3 There is no permanent additional land take associated with the revised Scheme, though with the reduced embankment heights there will be very minor reductions in land take at these locations.

7.0 Conclusions

7.1.1 The ecological assessment undertaken for the proposed RVR track reinstatement project has assumed a precautionary approach to potential species and habitats present within the project footprint and surrounding area. The approach was necessary in light of the refusal of all directly affected landowners to allow access onto their land for surveys to be undertaken.

7.1.2 Detailed surveys will be undertaken post-planning to further inform the detail of the proposed mitigation to support applications for EPSM licenses where required. This is consistent with established practice.

7.1.3 The approach taken provides a reasonable worst case scenario approach to the potential presence/absence of species and habitats, as well as the proposed proportionate mitigation to address the predicted impacts, thus providing Rother District Council with sufficient information on which to make a decision on the environmental impacts associated with the proposed railway reinstatement.

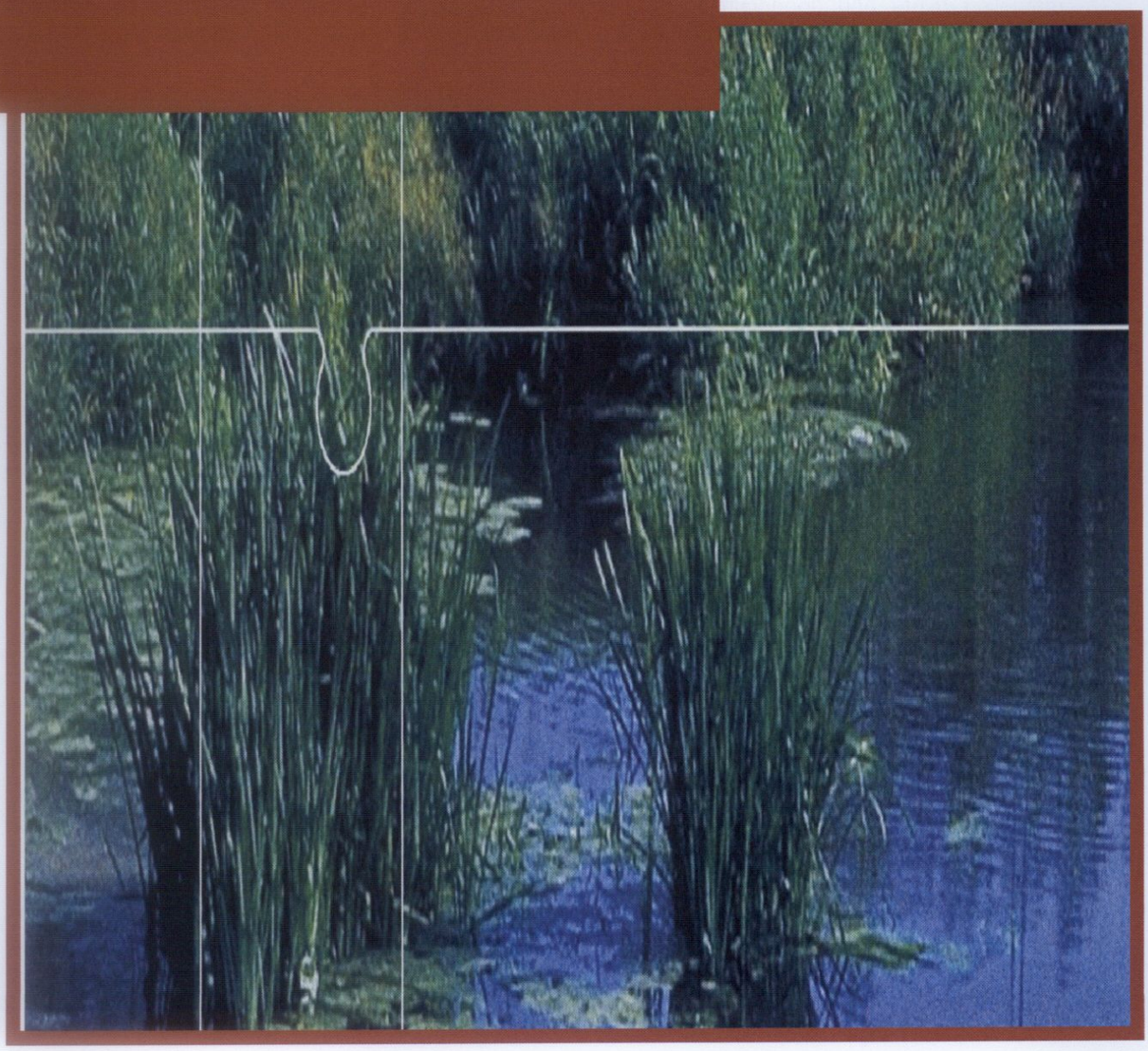
7.1.4 The results and conclusions of the original ES have been reviewed in light of the proposed changes to the Scheme design to address flood risk to the railway and surrounding land. Given the nature of the changes, it is considered that there will be no material adverse change to the assessments undertaken. On the contrary, the reduction in flood risk is a significant benefit. Together with the further information provided on ecological issues in this addendum, it is considered that the original ES remains robust.

Appendix A – Flood Risk Assessment (June 2016)

CAPITA

Rother Valley Railway

Flood Risk Assessment
June 2016



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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 historic railway line with a new embankment and the addition of culverts, bridges and viaducts along its route.

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 'Planning Practice Guidance' which replaced the 'Technical Guidance to the National Planning Policy Framework' in March 2014. The site has been modelled using Flood Modeller (previously known as 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 "with railway" 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) with climate change design flood event. The modelling undertaken for this FRA (2016) and by the Environment Agency in 2011 shows that overtopping of the existing flood protection scheme occurs at some locations for a 1% AEP and larger flood events in the baseline (without railway) scenario. The river modelling techniques currently available are more advanced than those available when the flood defence scheme was designed and built.

5. The modelling found that the construction of the railway would not increase flood risk to properties during a 1% AEP with climate change design flood event in Northbridge Street and Robertsbridge. The impact across the floodplain varies with some areas benefiting from reduced flood levels and others experiencing potential increases in flood levels of up to 50mm. There are a few small isolated areas, immediately adjacent to the proposed railway where predicted increases in water levels are greater.

6. Small sections of the defences are overtopped in both the existing (baseline) and 'with railway' scenario in the 1% AEP and 1% AEP with climate change design flood events. The 'with railway' scenario predicts a reduction of up to approximately 400 mm in flood depth behind the defences in Robertsbridge in the 1% AEP with climate change design event. The 'with railway' scenarios predicts a reduction of up to approximately 50mm in flood depth behind the defences in Northbridge Street in the 1% AEP design event

7. Flooding of the existing track downstream of Udiam already occurs and is managed by the operators of the railway line. To manage the consequences of flooding between Robertsbridge and Udiam the train operators will sign up to the Environment Agency's Flood Warnings Direct service and cease any services when there is a risk of flooding.

8. The proposed railway is considered at low risk of groundwater flooding, low to medium risk of flooding from artificial sources and medium risk of flooding from surface water. The approach to managing the residual risk of flooding from artificial sources is discussed in section 5.4.

The table below summarised key aspects of the study:

Site Name	Rother Valley Railway, Robertsbridge
Location	Northbridge Street to Junction Road, Udiam
Client	Rother Valley Railway Ltd
Grid Reference	NGR TQ7380724014 to TQ7718624322
Length of Railway	3.5 km
EA Flood Zone Classification	Flood Zone 3
SFRA	Rother District Council SFRA
Current Site Use	Site of dismantled railway - farm land
Description of proposed development	Reinstate historic railway line in the Rother Valley
Vulnerability Classification	Less vulnerable
History of Flooding	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 meters.
Flood Defences	A flood alleviation scheme was constructed at Robertsbridge and Northbridge Street in 2003/4.
Summary of Risks	Fluvial – High Surface Water – Medium Groundwater – Low Artificial Sources - Low to medium

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Appendices

Appendix A - Flood Risk Maps

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 old line railway line with raised embankments, culverts and bridges along the route. The propose railway scheme also include sections of track lowered close to ground level and a number of viaducts to maintain floodplain flow routes and minimise the impact on flood levels.

1.1.2 A FRA was submitted in January 2014 which is superseded by this report. Amendments to the proposed scheme including changes to the track elevations, number of culverts and viaducts have been made since 2014 and further hydraulic modelling has been undertaken. The potential impact of the railway on flood risk has been managed by these amendments to the scheme and no works are proposed to the existing defences. Further details of the proposed railway scheme and modelling undertaken for the FRA are included in the Rother Valley Railway FRA Modelling Report (June 2016).

1.1.3 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 'Planning Practice Guidance' which replaced the 'Technical Guidance to the National Planning Policy Framework' in March 2014.

1.1.4 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.

1.1.5 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, flood relief culverts and viaducts 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;
- Polices 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 Planning Practice Guidance (2014)

2.3.1 The Planning Practice Guidance provides additional guidance to enable the effective implementation of the planning policy set out in the National Planning Policy Framework. With respect to Flood Risk and Coastal change it advises on how planning can take account of the risks associated with flooding and coastal change in plan-making and the application process.

2.3.2 The document provides supporting information on a number of items including:

- The application of the sequential approach and Sequential and Exception Tests;
- Reducing the causes and impacts of flooding; and
- Site specific flood risk assessment.

2.4 Rother Local Plan Core Strategy

2.4.1 Rother District Council Core Strategy sets the overall vision and objectives for development in the district up to 2028. The Core Strategy was adopted by Full Council in September 2014. The Core Strategy forms part of the statutory Development Plan for the District and is used in the determination of all planning applications, alongside the saved policies in the Local Plan 2006.

2.4.2 The Objectives for Rural areas set out in the Core Strategy include 'To support sustainable tourism and recreation, including improved access to the countryside' (section 12.6). The Core Strategy also recognises tourism is an important component of the rural economy, including the Kent and East Sussex Railway. It also states there is further scope to develop business and cultural tourism and 'green tourism' particularly in the towns and High Weald. Policy EN7 in the Core Strategy relates to Flood Risk and Development.

2.4.3 The Local Plan (2006) saved policy relevant to the Rother Valley Railway reinstatement is 'EM8 - Bodiam/Robertsbridge railway' and is detailed below.

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 Udiam, Northbridge Street and the River Rother.**

2.4.4 This FRA demonstrates how the proposals meet the criteria 1 - 'it must not compromise the integrity of the floodplain and the flood protection measures at Robertsbridge'.

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.

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 raised embankment, bridges, culverts, viaducts and setting the track in certain locations to close to ground levels. Figure 1 shows the route of the proposed railway.

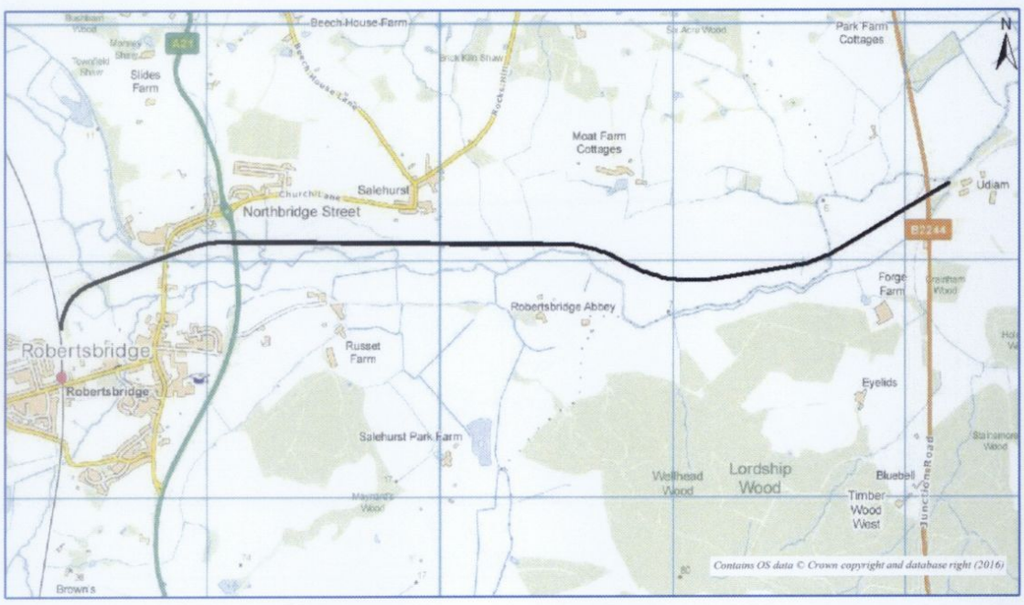


Figure 1 - Proposed Route of Railway

3.2 Vulnerability Classification

3.2.1 The site lies within the Environment Agency's Flood Zone 3, which is described within the Planning Practice Guidance Table 1: Flood Risk 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 river flooding (>1%), or a 1 in 200 or greater annual probability of sea 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 Planning Practice Guidance Table 2: Flood Risk Vulnerability Classification. However it should be noted that there is argument for it to be classified as water compatible as during times of flood the railway will not be operated.

3.2.3 Table 3: Flood Risk Vulnerability and Flood Zone Compatibility in that Planning Practice Guidance, states that less vulnerable land uses are compatible in Flood Zone 3a.

3.2.4 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 lowered sections of railway, 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. The consequences of flooding to the railway will be managed through the train operator 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.

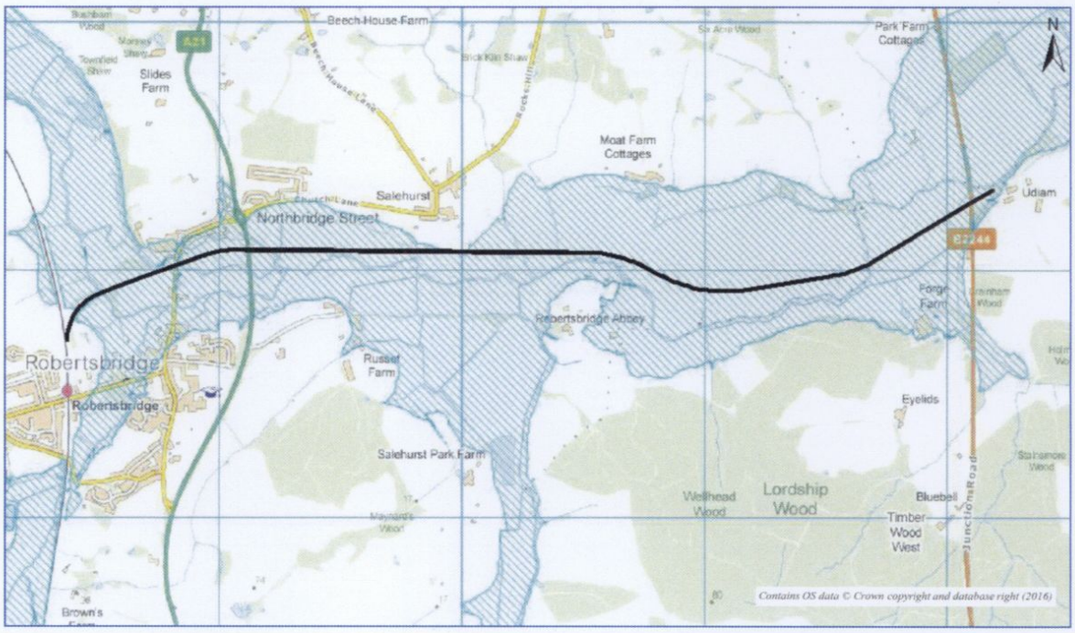


Figure 2 - Environment Agency Flood Zone 3

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 Rother Local Plan (2006) including tourism and linking to main line services from Hastings to London.

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, and provides a small reduction in flood risk to residential property in Northbridge Street and Robertsbridge during large flood events. It is proposed that the train line is not operational 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[1].

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
12th October 2000 (greater than 1% event) 31st October 2000 5th 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.

[1] 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 are detailed in the Rother Valley Railway FRA Modelling Report (June 2016) and have been discussed with the Environment Agency.

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. The elevation of the railway varies along the route to maintain existing floodplain flow paths and floodplain connectivity.

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 Flood Risk and Coastal Change section of the Planning Practise Guidance.

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.[2]

4.4.3 The modelling undertaken for this FRA (2016) and by the Environment Agency in 2011 shows that overtopping of the existing flood protection scheme occurs at some locations for a 1% AEP and larger flood events. The river modelling techniques currently available are more advanced than those available when the flood defence scheme was designed and built.

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.

[2] Environment Agency, 2011, River Rother Final Hydraulic Modelling, ABD, and Hazard Mapping Report, Hyder.

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, viaducts and flood relief culverts through the embankment. This model is referred to hereafter as 'with railway' scenario. 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' scenario. The defences at Robertsbridge are predicted to overtop in the 1% AEP with climate change design event for both the baseline and 'with railway' scenario (see Figure 3).

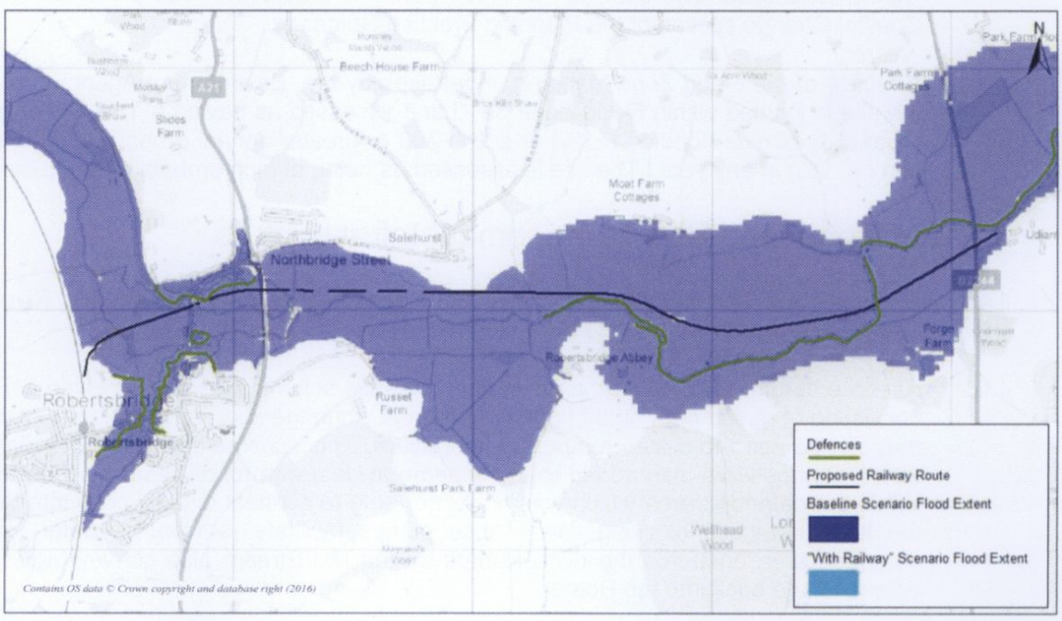


Figure 3 - 1% AEP with climate change flood extent for the 'baseline' and 'with railway' scenario.
(Note the 'with railway' scenario flood extent is drawn below the baseline flood extent shown and therefore it is only visible on the map where its extent is greater than the baseline flood extent).

4.5.4 The section of the railway between Salehurst and Robertsbridge Abbey and near Udiam between Austins Bridge and the B2244 are at risk in all the flood events modelled. The proposed railway elevations between Salehurst and Robertsbridge Abby have been lowered to maintain floodplain flow paths and connectivity. 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.

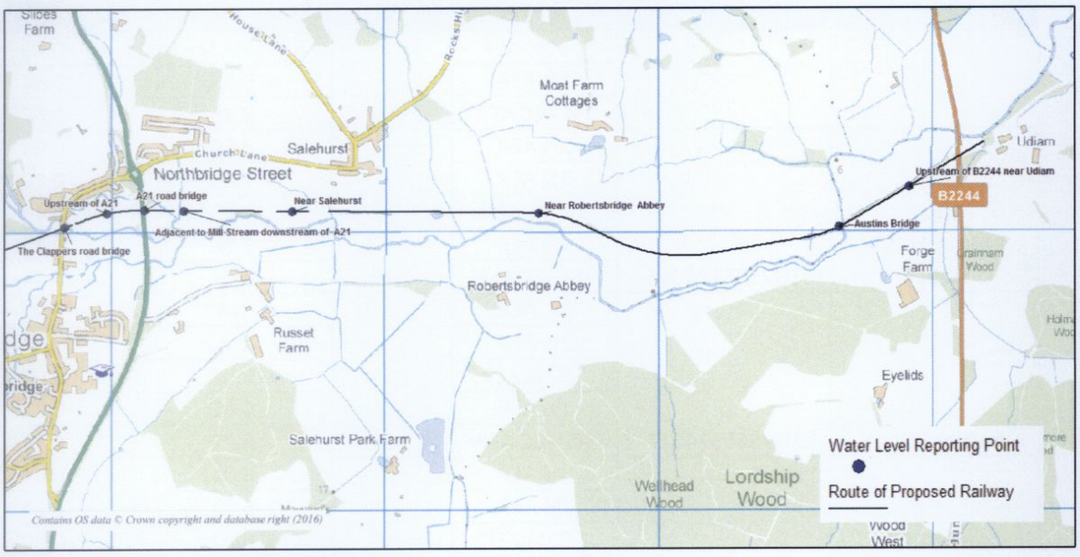


Figure 4 - The locations referred to in Table 4.2

Table 4.2 Flood Levels along the proposed reinstated railway

Location Description	NGR	Design Flood Event	Railway level (m AOD)	With Railway Flood Level (m AOD)*	Approximate depth of water on railway (m)
The Clappers road bridge	TQ7382024019	5% AEP	11.53	NA	NA
		2% AEP		11.64	0.11
		1.33% AEP		11.80	0.27
		1% AEP		11.88	0.35
		1% +CC AEP		11.99	0.46
Upstream of A21	TQ7397724069	5% AEP	11.523	NA	NA
		2% AEP		NA	NA
		1.33% AEP		NA	NA
		1% AEP		NA	NA
		1% +CC AEP		NA	NA
A21 road bridge	TQ7411524079	5% AEP	11.387	NA	NA
		2% AEP		NA	NA
		1.33% AEP		NA	NA
		1% AEP		NA	NA
		1% +CC AEP		NA	NA
Adjacent to Mill Stream downstream of A21	TQ7426124078	5% AEP	11.115	NA	NA
		2% AEP		NA	NA
		1.33% AEP		NA	NA
		1% AEP		NA	NA
		1% +CC AEP		NA	NA
Near Salehurst	TQ7465424075	5% AEP	8.78	9.07	0.29
		2% AEP		9.20	0.42

Location Description	NGR	Design Flood Event	Railway level (m AOD)	With Railway Flood Level (m AOD)*	Approximate depth of water on railway (m)
		1.33% AEP		9.27	0.49
		1% AEP		9.32	0.54
		1% +CC AEP		9.45	0.67
		5% AEP		7.80	0.01
		2% AEP		7.89	0.10
Near Robertsbridge Abbey		1.33% AEP		7.93	0.14
		1% AEP		7.96	0.17
	TQ7555724065	1% +CC AEP	7.79	8.03	0.24
		5% AEP		NA	NA
		2% AEP		NA	NA
		1.33% AEP		6.57	0.02
		1% AEP		6.62	0.07
Austins Bridge	TQ7665324017	1% +CC AEP	6.55	6.73	0.18
		5% AEP		6.04	0.64
		2% AEP		6.24	0.84
Upstream of B2244 near Udiam		1.33% AEP		6.32	0.92
		1% AEP		6.39	0.99
	TQ7690924161	1% +CC AEP	5.4	6.53	1.13

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)

4.5.5 The changes in flood risk between the 'with railway' and baseline scenarios, at key locations are listed in Table 4.3. The locations referred to in the table are shown in Figure 5. The table demonstrates that flood risk is not increased behind the defences in the Northbridge Street and Robertsbridge area in the 'with railway' scenario.

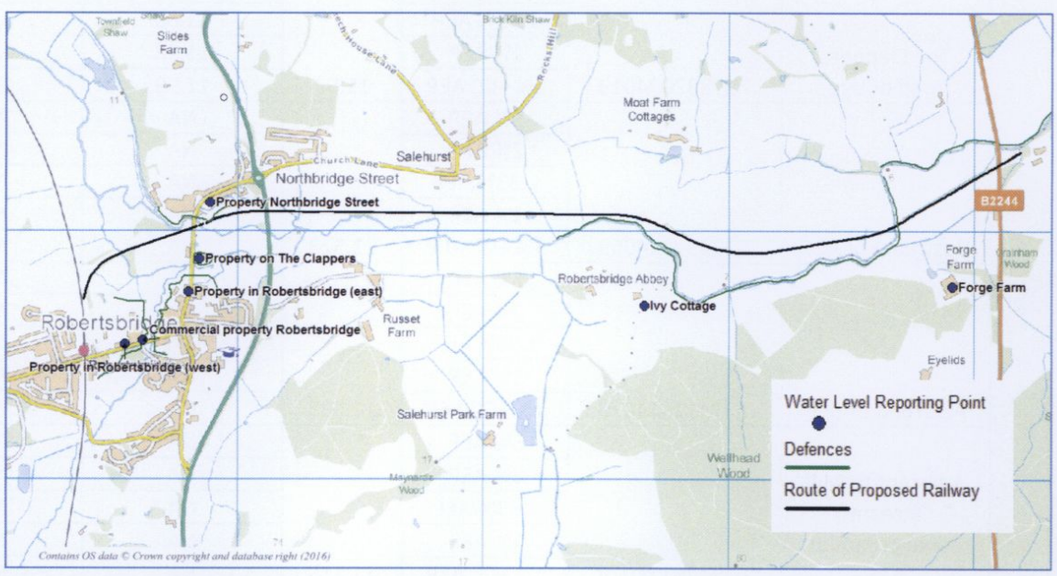


Figure 5 - The locations referred to in Table 4.3

Table 4.3 Change in Flood Risk

Location	Flood Event	Change in Flood Risk between 'with railway' and baseline scenario (mm)
Commercial property, Station Road, Robertsbridge	5%	No Change
	2% AEP	No Change
	1.33% AEP	No Change
	1% AEP	No Change
	1% AEP + CC	No Change*
Property in Robertsbridge (west)	5%	Not Flooded
	2% AEP	Not Flooded
	1.33% AEP	Not Flooded
	1% AEP	Not Flooded
	1% AEP + CC	Reduced Flood Risk - Approx. 50mm reduction in flood depths in 'with railway' scenario
Property in Robertsbridge (east)	5%	Not Flooded
	2% AEP	Not Flooded
	1.33% AEP	Not Flooded
	1% AEP	Not Flooded
	1% AEP + CC	Reduced Flood Risk - Approx. 40mm reduction in flood depths in 'with railway' scenario
Property on The Clappers (Bridge Bungalow/Museum)	5%	Not Flooded
	2% AEP	Not Flooded
	1.33% AEP	Not Flooded
	1% AEP	Not Flooded
	1% AEP + CC	No Change*
Property in Northbridge Street	5%	Not Flooded
	2% AEP	Not Flooded
	1.33% AEP	Not Flooded
	1% AEP	Reduced Flood Risk - Approx. 80mm reduction in flood depths in 'with railway' scenario
	1% AEP + CC	Reduced Flood Risk - Approx. 10mm reduction in flood depths in 'with railway' scenario
Ivy Cottage, near Robertsbridge Abbey	5%	Not Flooded
	2% AEP	Not Flooded
	1.33% AEP	Reduced Flood Risk - Approx. 40mm reduction in flood depths in 'with railway' scenario

	1% AEP	Reduced Flood Risk - Approx. 50mm reduction in flood depths in 'with railway' scenario
	1% AEP + CC	Reduced Flood Risk - Approx. 40mm reduction in flood depths in 'with railway' scenario
Forge Farm, B2244, near Udiam (Note finished floor levels in FRA)	5%	Not Flooded
	2% AEP	Not Flooded
	1.33% AEP	Not Flooded
	1% AEP	Flood depth 2mm in 'with railway' scenario**
	1% AEP + CC	No change in flood risk - Approx. 2mm change in 'with railway' scenario*** Predicted water level is 6.558 mAOD in baseline and 6.560 mAOD in 'with railway' scenario

* Where the reduction in flood depth in the 'with railway' scenario is less than 5mm, no change has been stated in the table due to the accuracies of the modelling.

** Given the accuracy and stability tolerances of the model this is not considered significant. The area shown as hatched in Figure A4, Appendix A.

*** 2mm is considered as no change in flood risk due to the accuracies of flood modelling.

4.5.6 The differences in flood levels at Forge Farm are very small and are within the stability tolerances of the model. Given the accuracy of the model flood risk is considered to be unchanged at Forge Farm. It should be noted that this area is not the focus of this FRA and a more detailed model may be required by the Environment Agency for any future development at the Forge Farm site.

4.5.7 It should be noted that a FRA was undertaken in 2008 for the Forge Farm site. This was prior to the Environment Agency Modelling and no modelling appears to have been undertaken for the FRA. The FRA reports 1% AEP and 1% AEP with climate change levels lower than those predicted by the baseline model. The FRA recommends floor slabs are set to a minimum of 6.41mOD. The Environment Agency comments on the development included a recommendation that the occupants register with the Floodline Warnings Direct service.

4.5.8 Flood extent figures for all design flood events are provided in Appendix A. The difference in predicted water depth between the 'with railway' and baseline scenarios are also in Appendix A (Figures B1 to C5). The figures illustrate the proposed railway has a negligible impact on flood levels across the majority of the floodplain.

4.5.9 The extent of flooding is very similar in all design flood events for the baseline and 'with railway' scenarios. The slight increase in flood extent at the Forge Farm site for the 1% AEP design event is due to the 2 mm depth of water above the floor levels recommend in the 2008 FRA. The area is shown as hatched in Figure A4, Appendix A. As discussed above, 2 mm is not considered significant given the accuracy and tolerances of the model.

4.5.10 The difference in flood levels across the floodplain between the baseline and 'with railway' scenario are generally less than 50 mm. There are some areas of the floodplain where the water levels are lower in the 'with railway' scenario than the baseline. There are also some small areas generally adjacent to the railway where the water levels in the 'with railway' scenario are more the 50mm above the baseline flood levels. There are no properties at these locations. This is shown in the Figure 6 below.

4.5.11 The model has demonstrated that the railway does not increase the frequency or extent of flooding. It has also demonstrated that the proposed reinstatement of the railway does not impact floodplain water levels upstream or downstream of the proposed development.

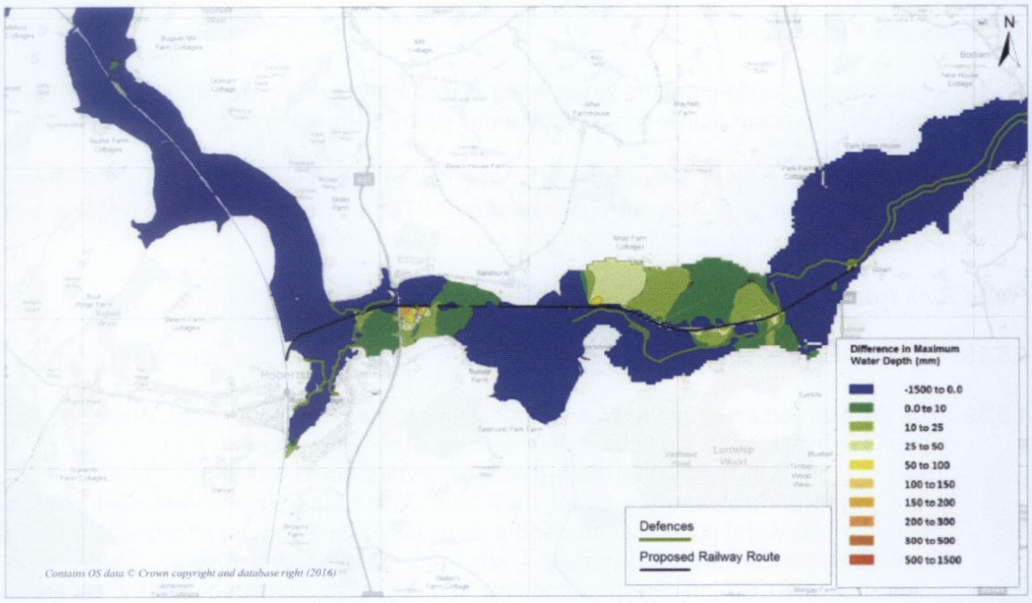


Figure 6 – Difference in water depths between 'with railway' and baseline scenarios for the 1% AEP with climate change design event

Tidal Flood Risk

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

Flood Risk from Land, Surface Water and Sewers

4.5.13 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.

4.5.14 The proposed railway is considered at low to medium risk of surface water/sewer flooding. The track for the majority if it length is higher than the surrounding ground. Where the track elevation is close to ground level to facilitate floodplain flows there is a greater risk of surface water ponding. The risk of surface water flooding to the track will be managed by the train operators and services will be stopped. The remaining sections of the railway line are unlikely to have ponding on the tracks in significant volumes. The railway line will be built on a permeable base with no significant change in surface water runoff.

4.5.15 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

4.5.16 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.

4.5.17 The proposed railway is considered at low risk of groundwater flooding. The proposed route is generally higher than the surrounding ground. The risk of groundwater flooding to the track will be managed by the train operators and services will be stopped.

Flood Risk from Artificial Sources

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

4.5.19 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.

4.5.20 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.

4.5.21 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; 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 proposed railway elevations, culverts, bridges and viaduct crossings maintain connectivity across the current floodplain and minimise the impact of the railway on floodplain water levels and flow paths.

5.3.3 The existing operational railway line already experiences frequent flooding along certain sections of the track. Procedures are already in place to deal with the flooding if this occurs and so these procedures will be applied to the new reinstated line. The risk of flooding to the track will be managed by the train operators and services will be stopped.

5.4 Management of Residual Risk of flooding from reservoirs

5.4.1 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.

5.5 The Environment Flood Warning and Evacuation plan

5.5.1 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 Rother District Council as being an acceptable development if flood risk is managed. The proposed scheme includes reinstating the historic railway line and incorporates a number of flood relief culverts, viaducts and bridges connecting the surrounding floodplains.

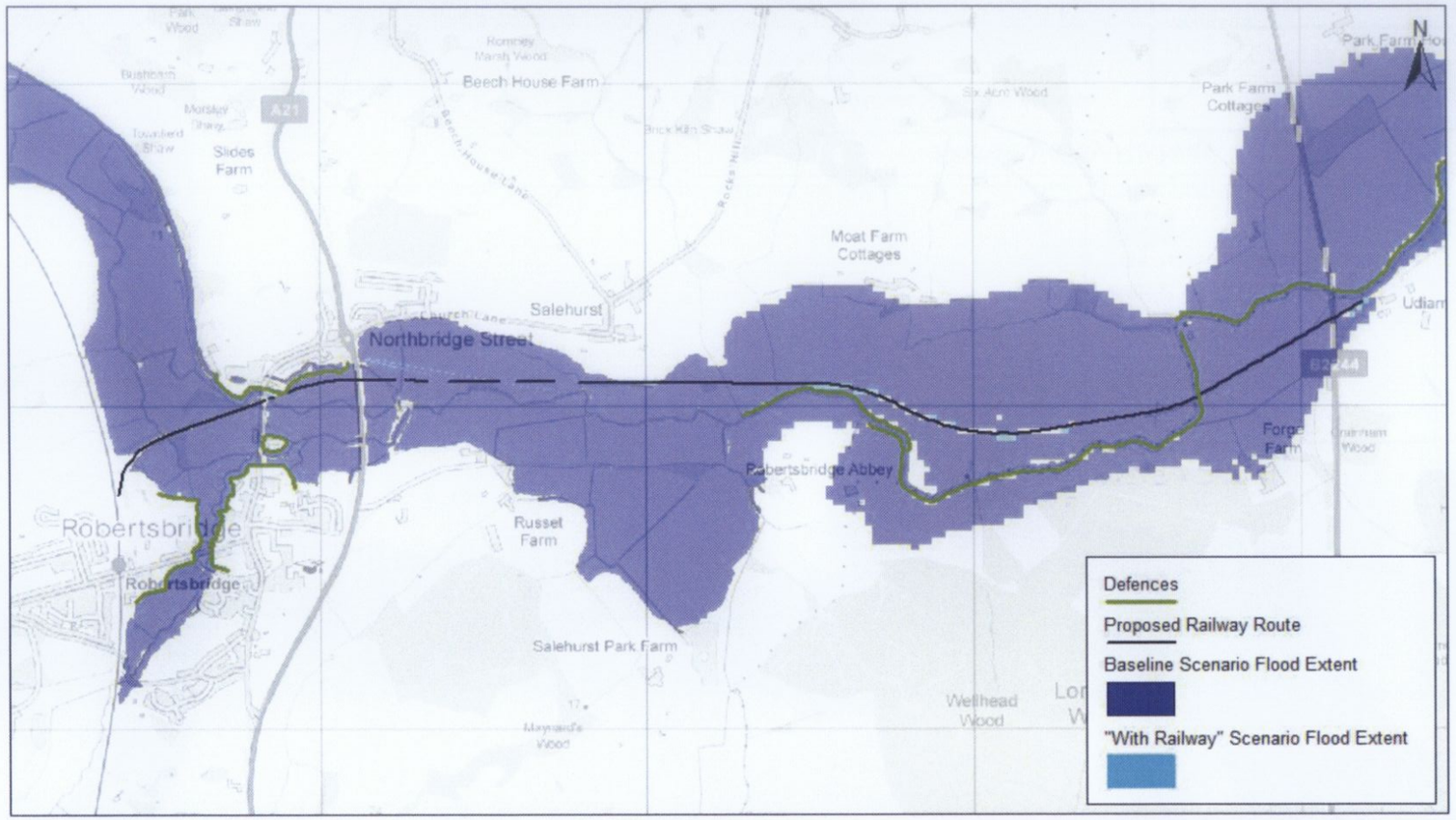
6.1.2 The modelling results have shown the flood extents between the baseline scenario and the proposed 'with railway' scenario have not changed significantly. The modelling indicates that there is a reduction in flood depths behind the Robertsbridge and Northbridge Street defences in the 1% AEP with climate change design flood events. The 'with railway' scenarios indicates some areas where water levels increase by up to 50mm, however there are also areas where the flood levels are lower in the 'with railway' scenario. The small areas where a larger increase in flood levels is predicted in the 'with railway' scenario are adjacent to the proposed railway, where no property is located.

6.1.3 In locations where the reinstated railway line ties into existing ground levels flooding is likely to inundate the track and impact on its operation. The risk from flooding to the public associated with the operation of the railway will be managed through restricting operation during times of severe flooding. 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.

6.1.4 It is recommended the train operator Kent and East Sussex Railway register to the Environment Agency's Flood Warnings Direct service to receive early warnings and updates of any potential risk of flooding. The use of this service will help them to effectively plan and utilise their flood risk management procedures currently in place.

6.1.5 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.

Appendix A - Flood Risk Maps



Rother Valley Railway

Figure A-1: Comparison of baseline scenario and 'with railway' scenario 5% AEP flood extents

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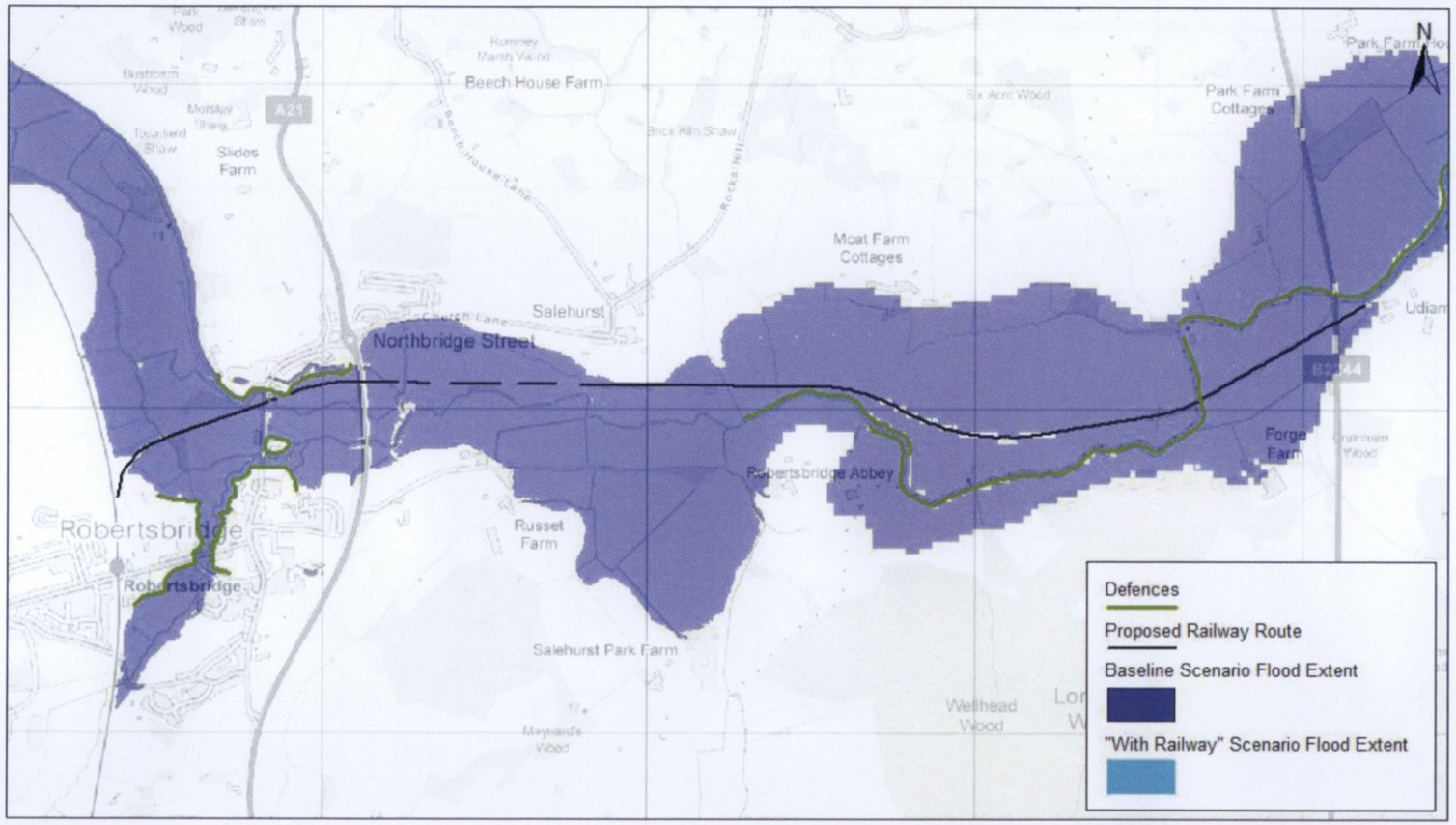

Rother Valley Railway

Figure A-2: Comparison of baseline scenario and 'with railway' scenario 2% AEP flood extents

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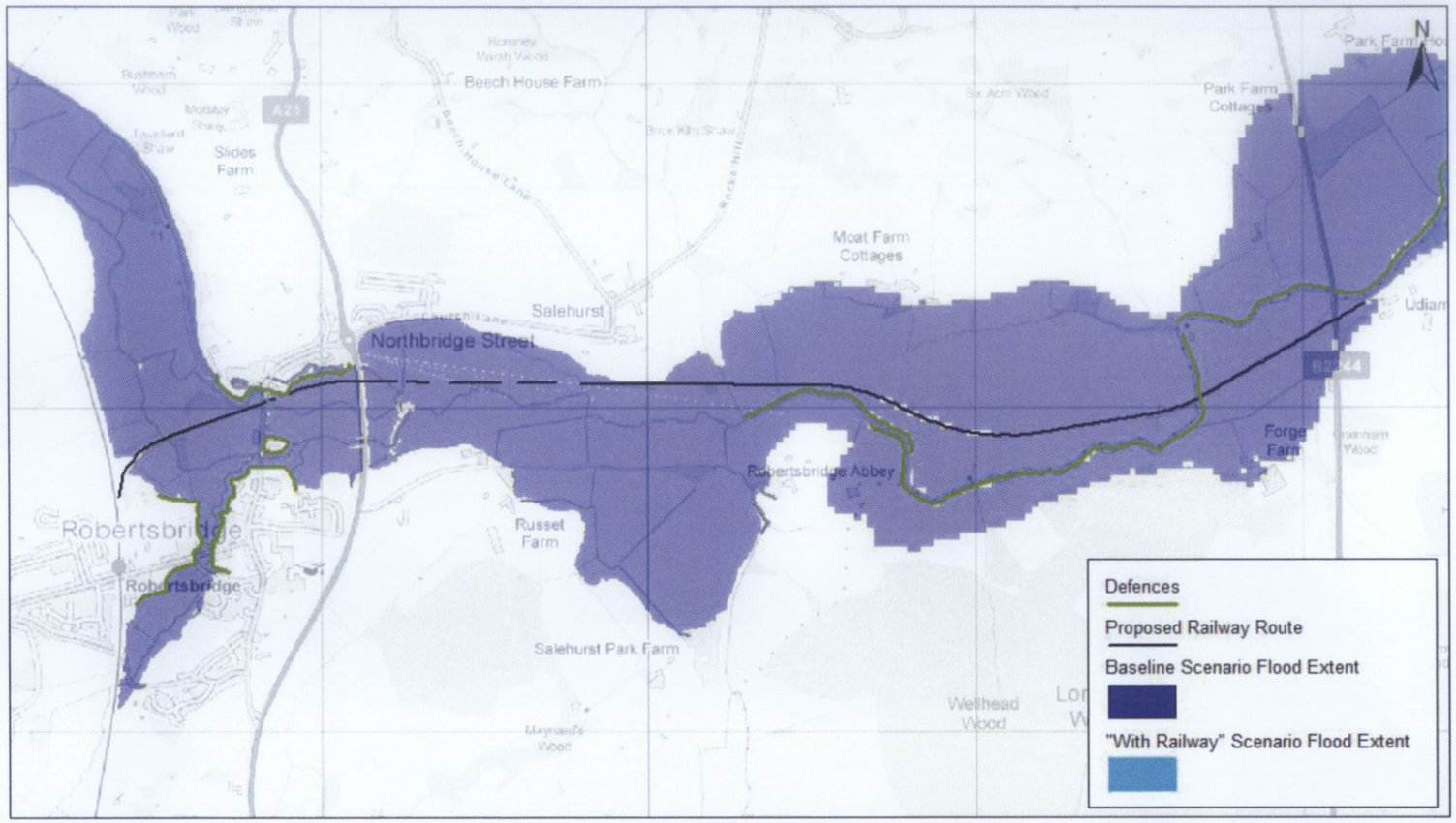

Rother Valley Railway							
Figure A-3: Comparison of baseline scenario and 'with railway' scenario 1.33% AEP flood extents						CAPITA	
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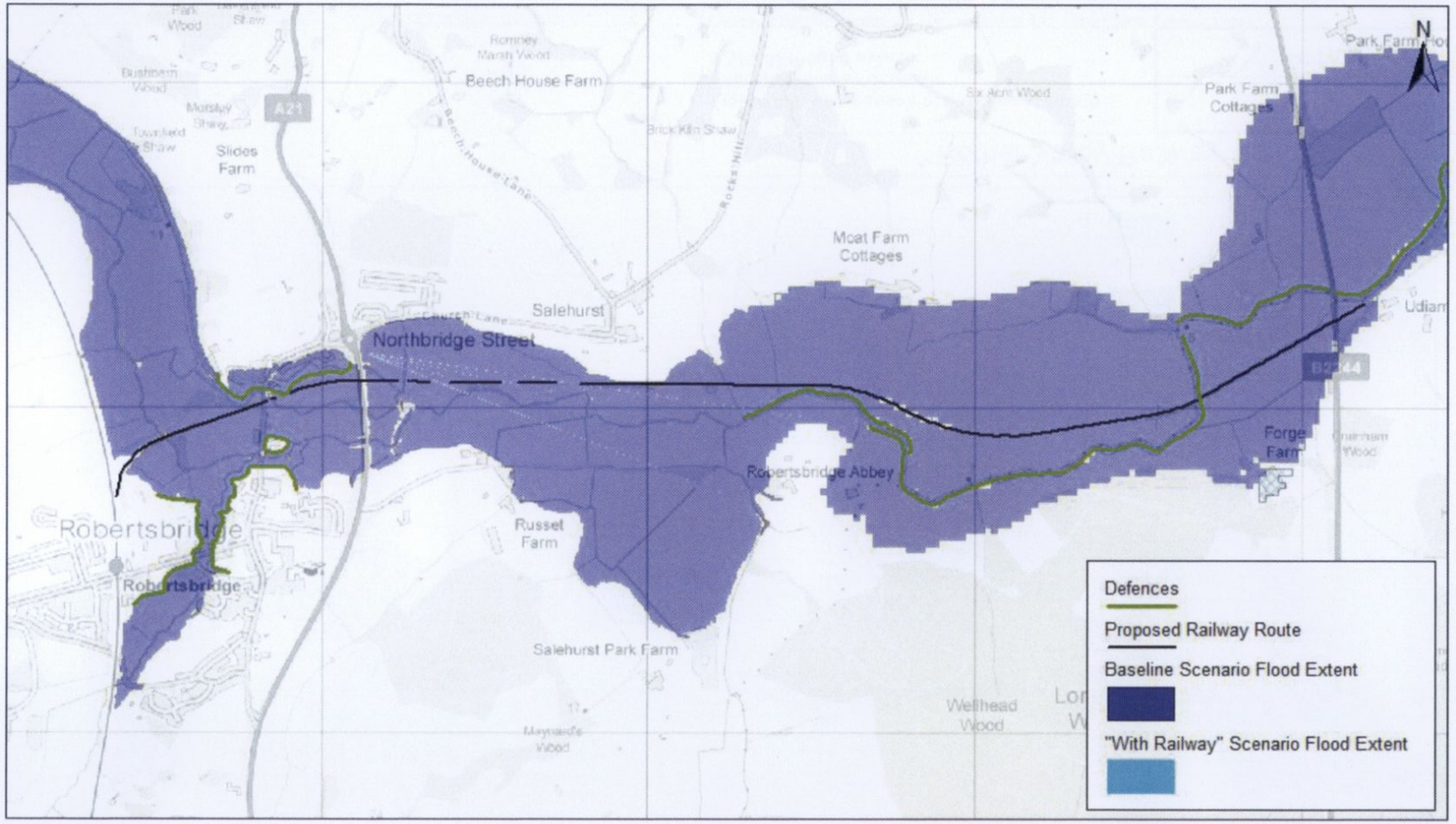

Rother Valley Railway

Figure A-4: Comparison of baseline scenario and 'with railway' scenario 1% AEP flood extents

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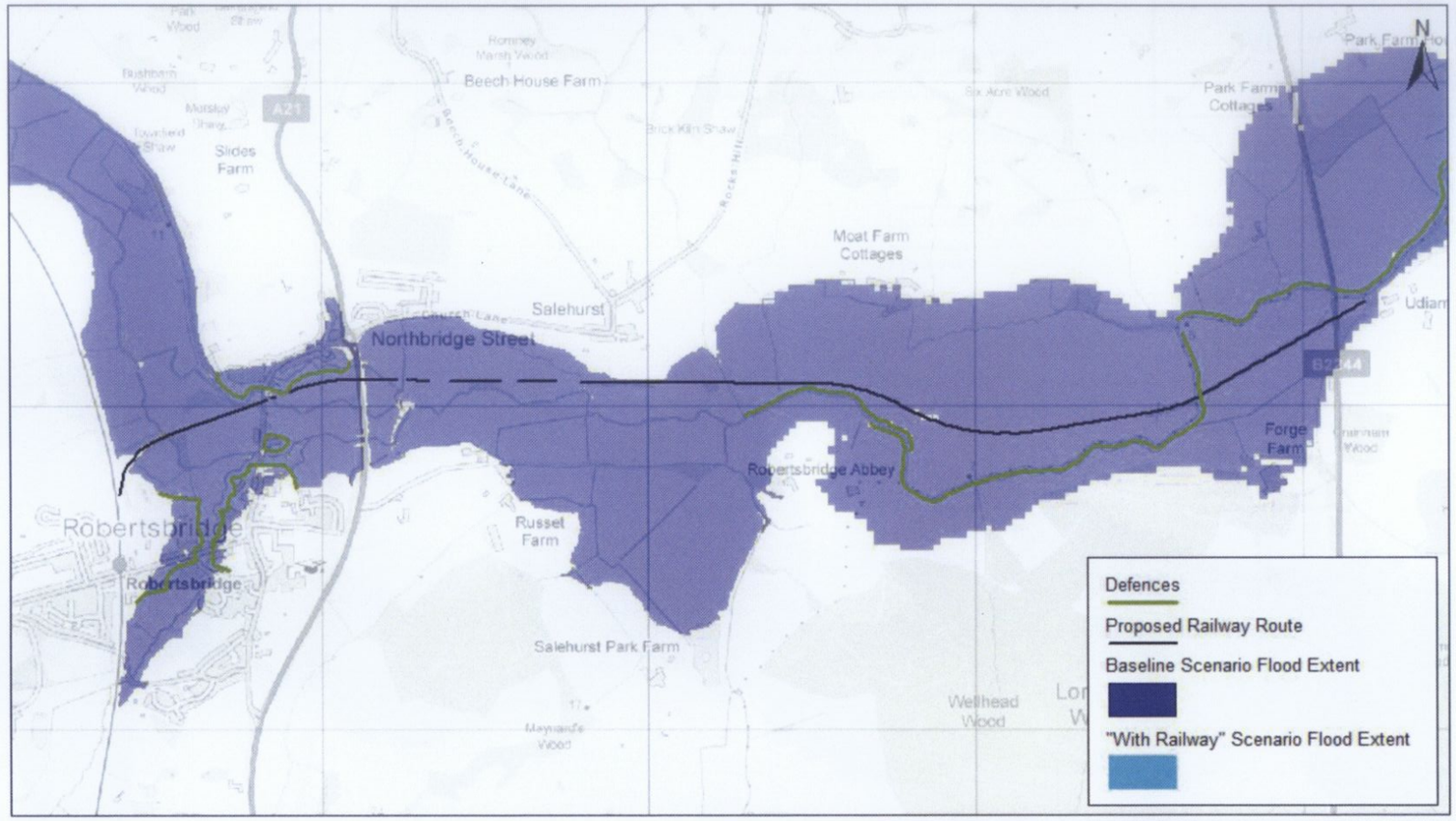

Rother Valley Railway

Figure A-5: Comparison of baseline scenario and 'with railway' scenario 1%+CC AEP flood extents

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TL	SC	AC	24/05/16	1:16000	E.Grinstead	Figure A-5	1

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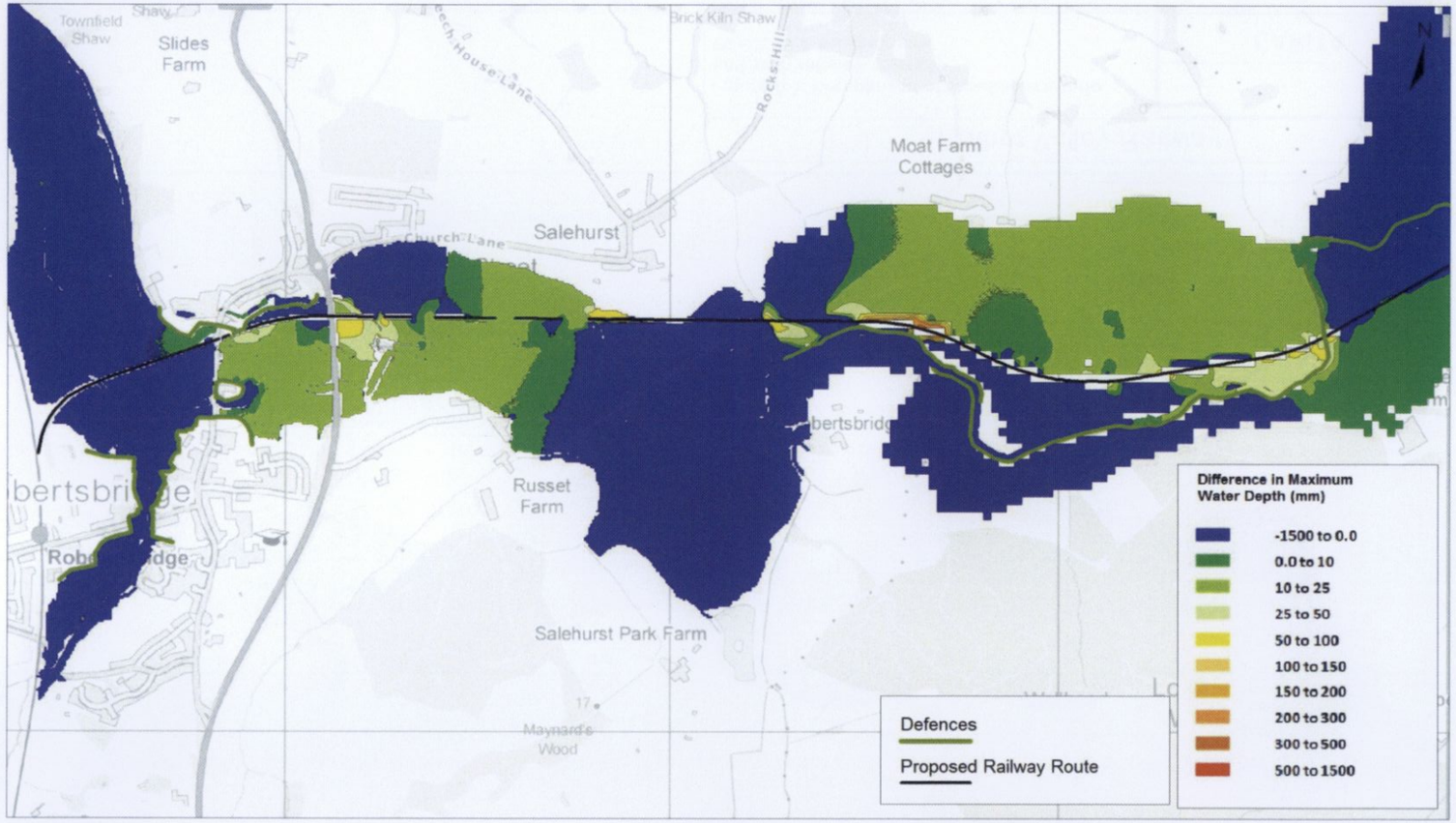

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Figure B-1: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 5% AEP flood event

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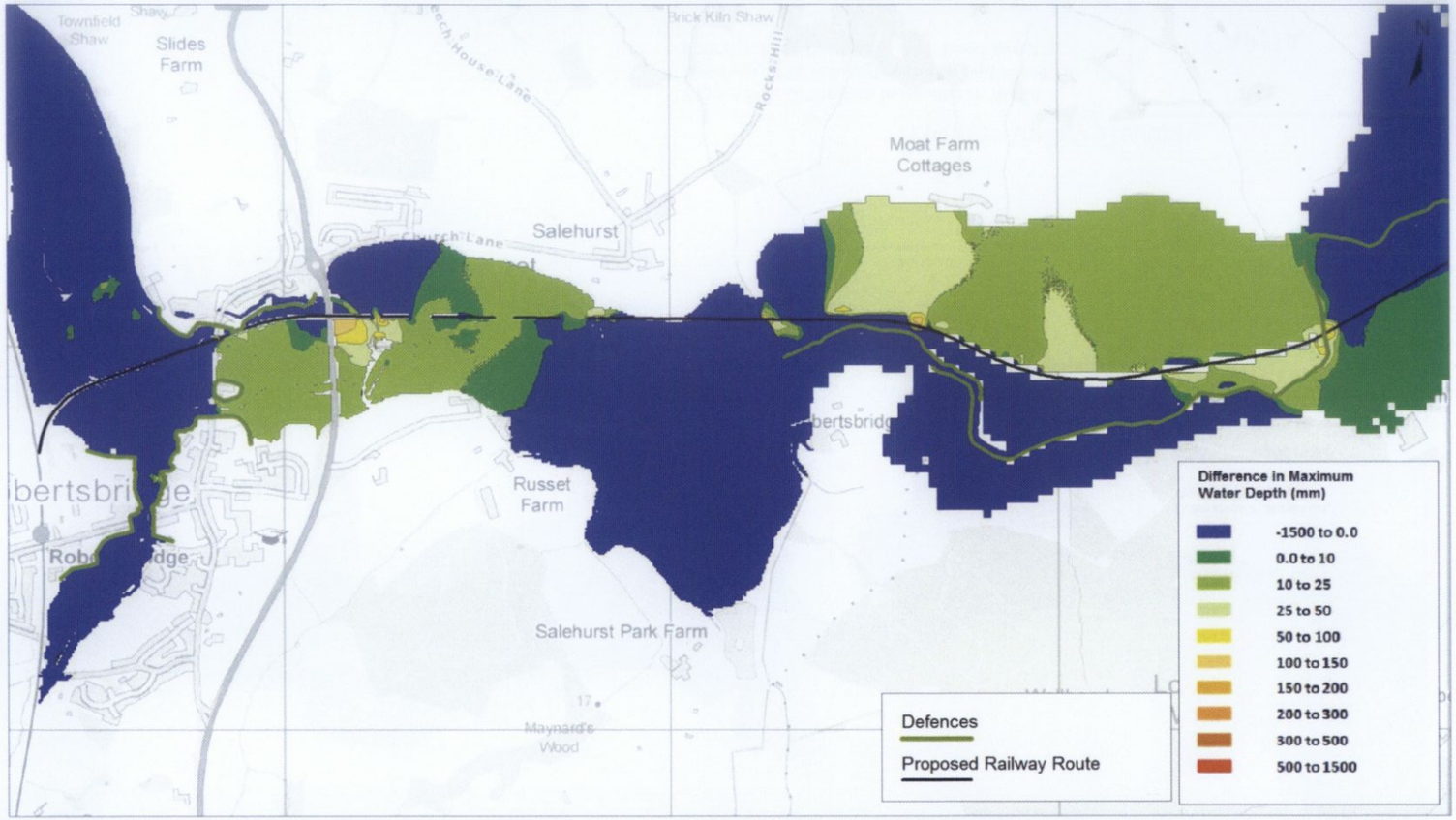

Rother Valley Railway

Figure B-2: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 2% AEP flood event

CAPITA

DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
TL	SC	AC	14/06/16	1:13500	E.Grinstead	Figure B-2	2

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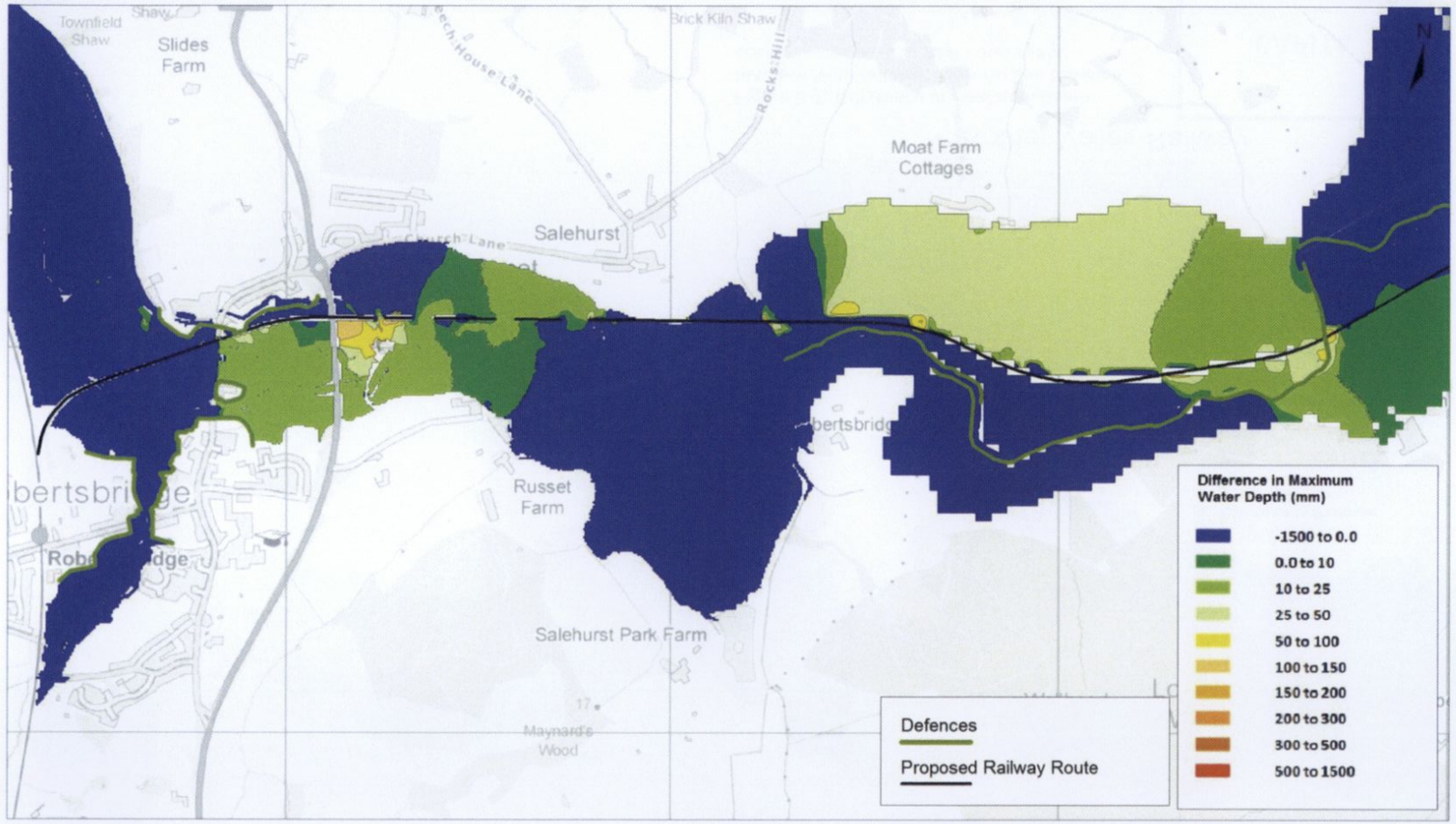

Rother Valley Railway

Figure B-3: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 1.33% AEP flood event

CAPITA

DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
TL	SC	AC	14/06/16	1:13500	E.Grinstead	Figure B-3	2

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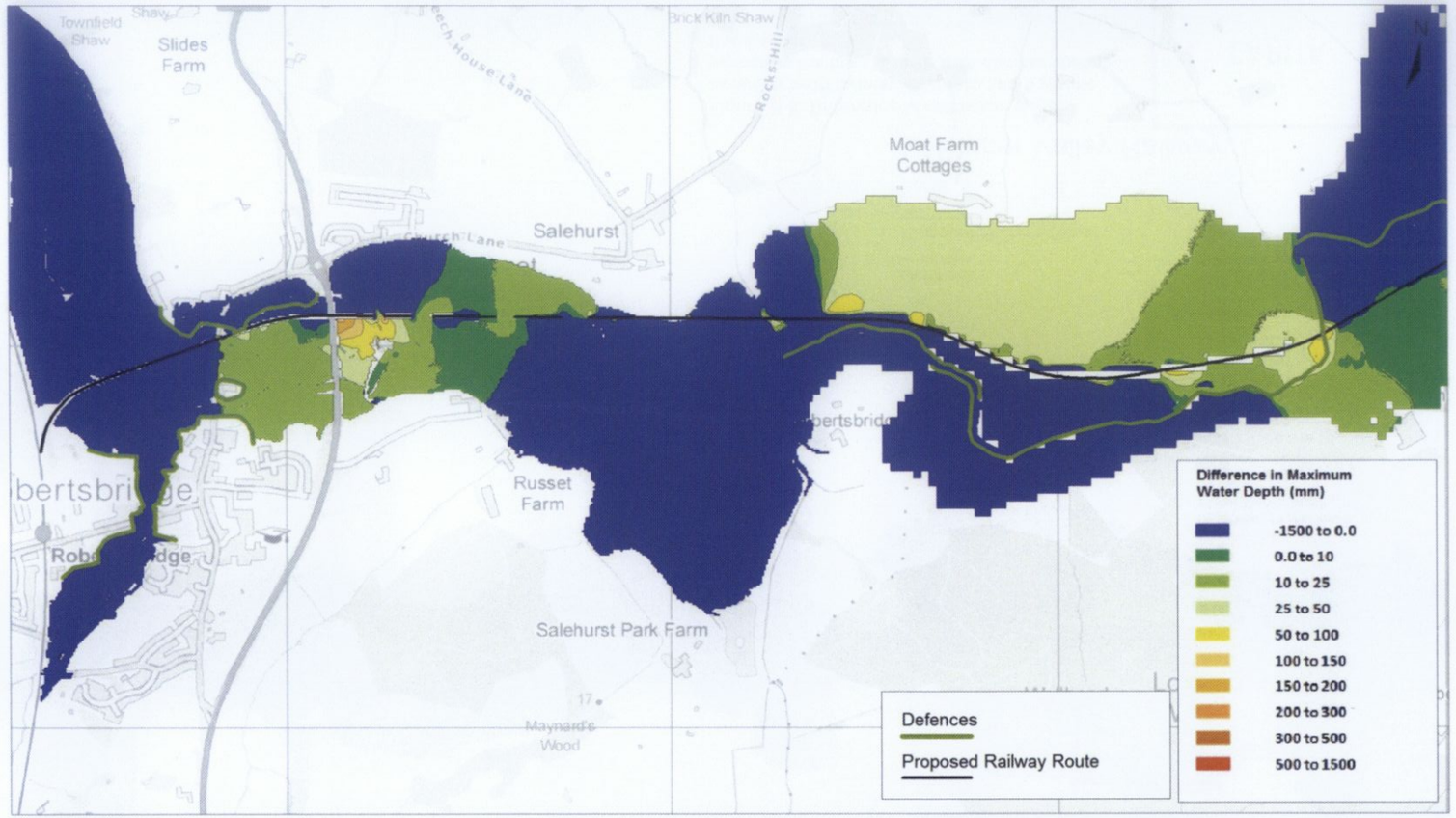

Rother Valley Railway

Figure B-4: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 1% AEP flood event

CAPITA

DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
TL	SC	AC	14/06/16	1:13500	E.Grinstead	Figure B-4	2

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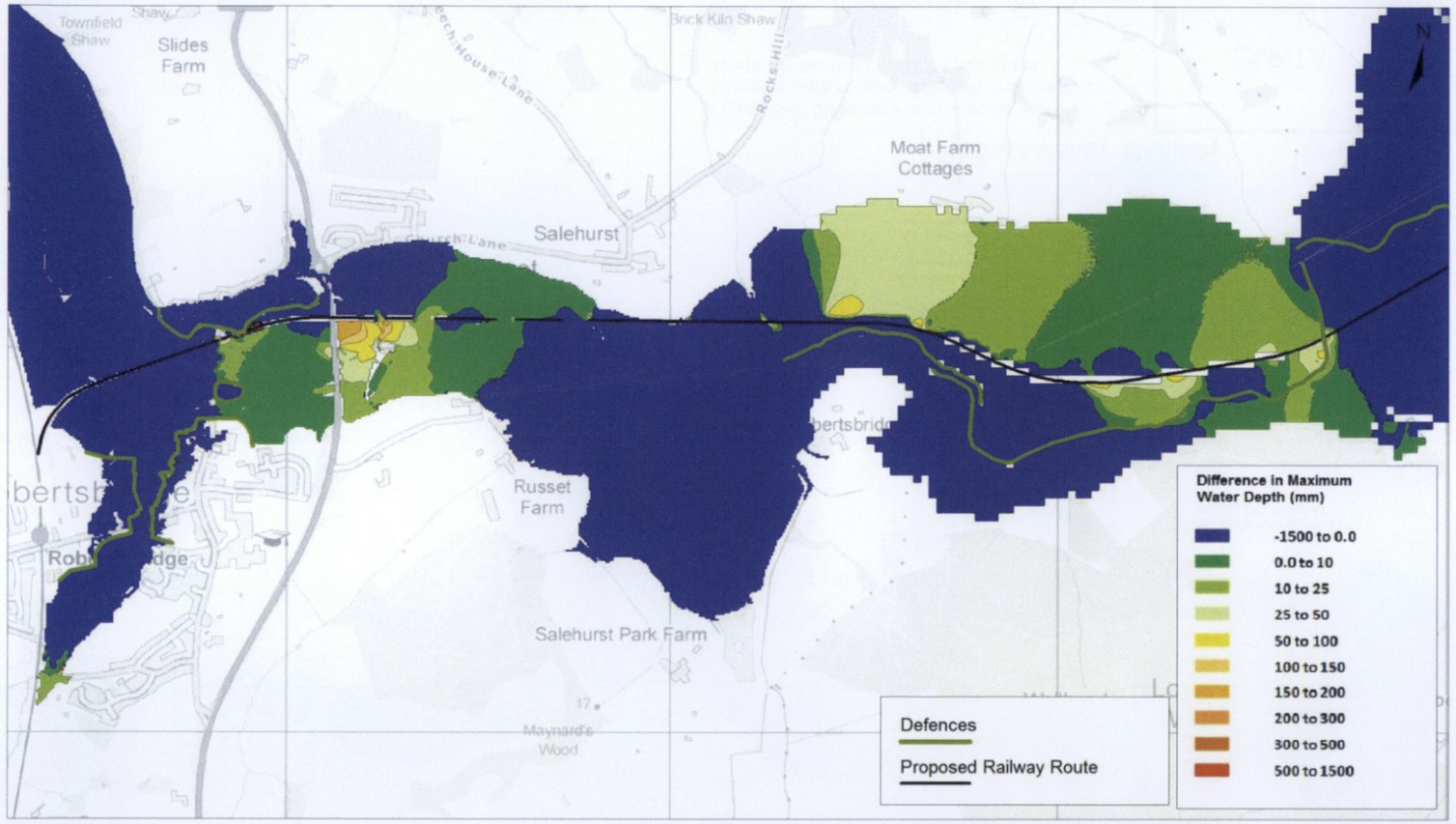

Rother Valley Railway

Figure B-5: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 1% AEP with climate change flood event

CAPITA

DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
TL	SC	AC	14/06/16	1:13500	E.Grinstead	Figure B-5	2

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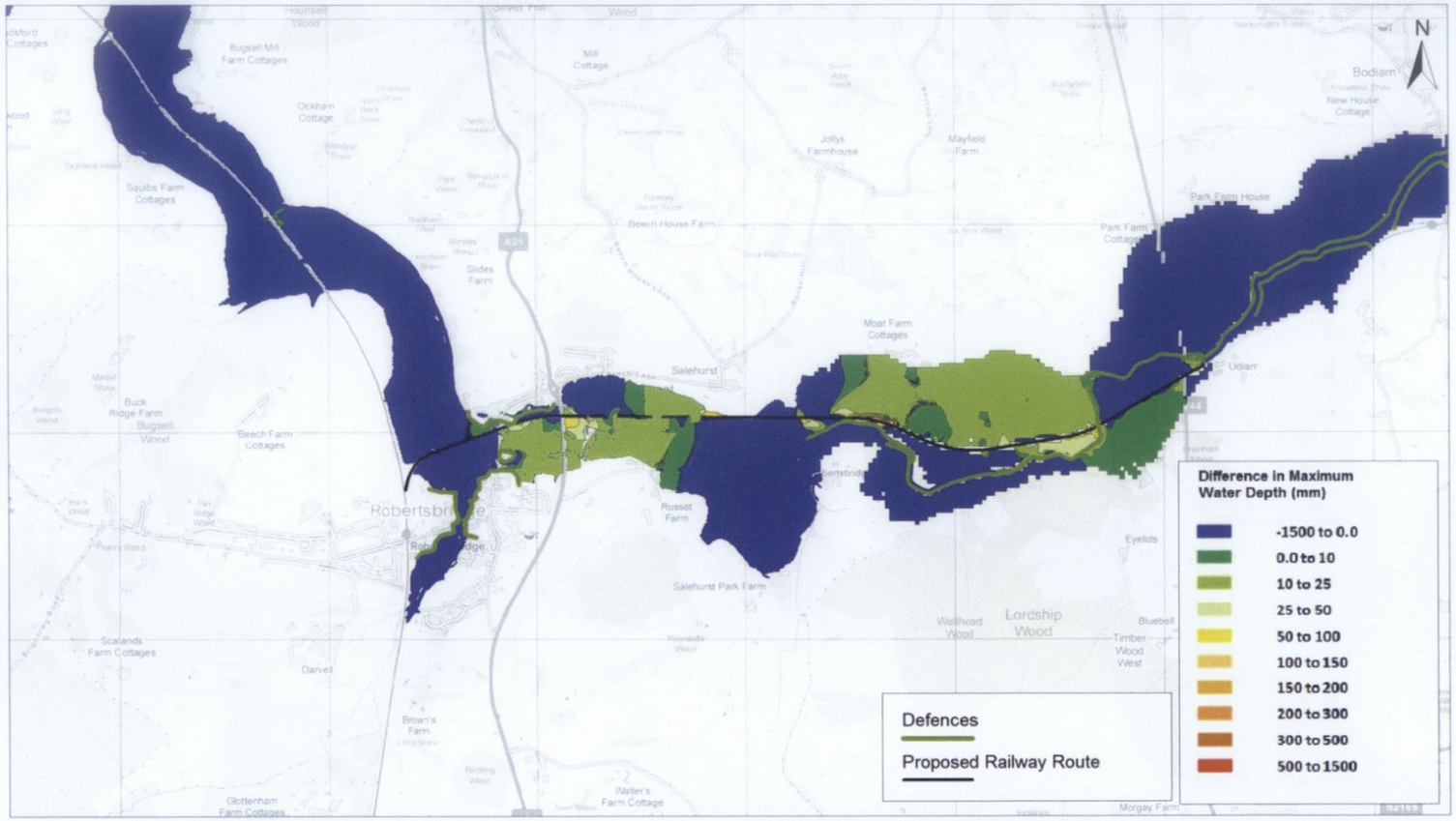

Rother Valley Railway

Figure C-1: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 5% AEP flood event

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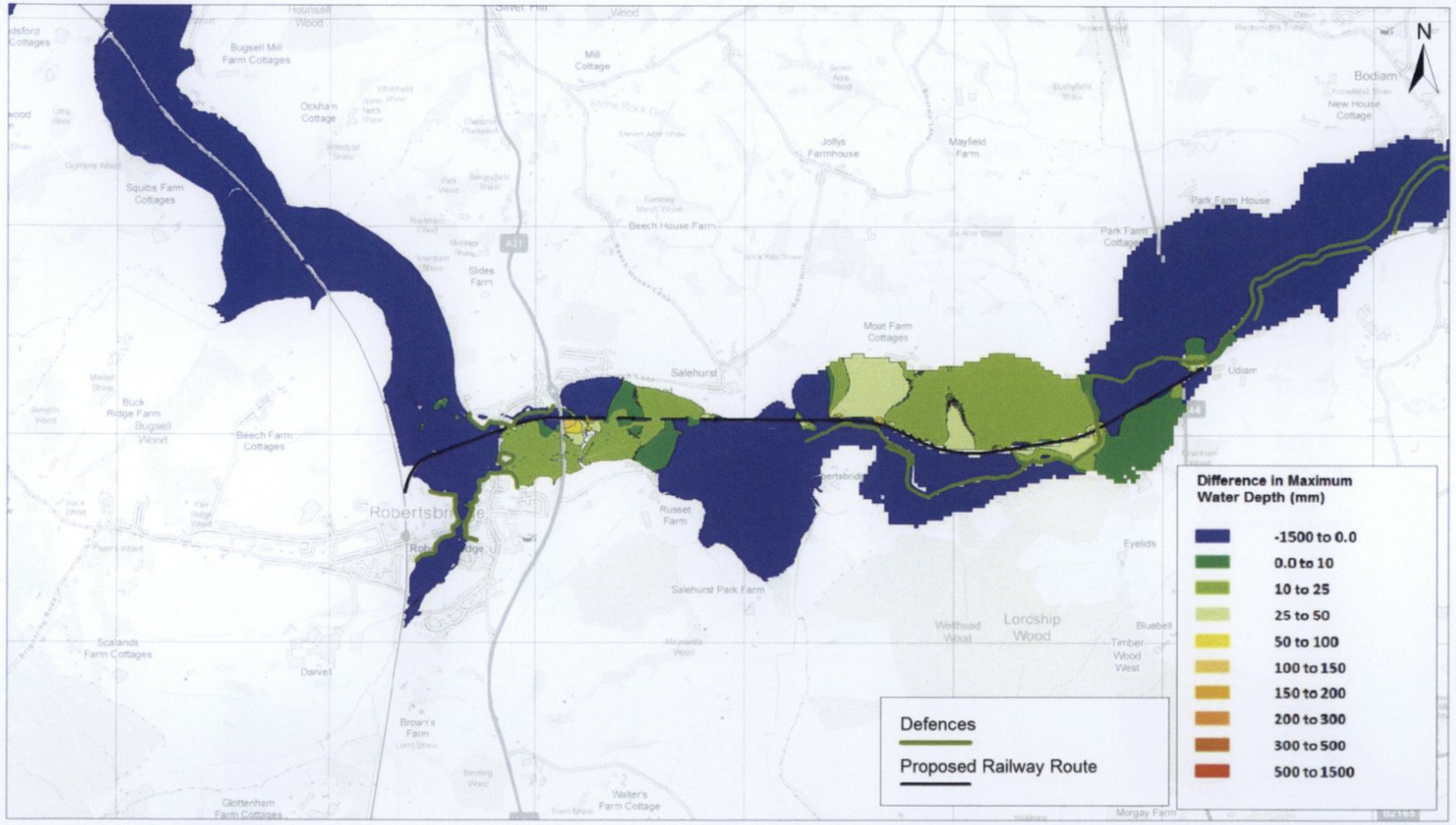

Rother Valley Railway

Figure C-2: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 2% AEP flood event

CAPITA

DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
TL	SC	AC	14/06/16	1:25000	E.Grinstead	Figure C-2	2

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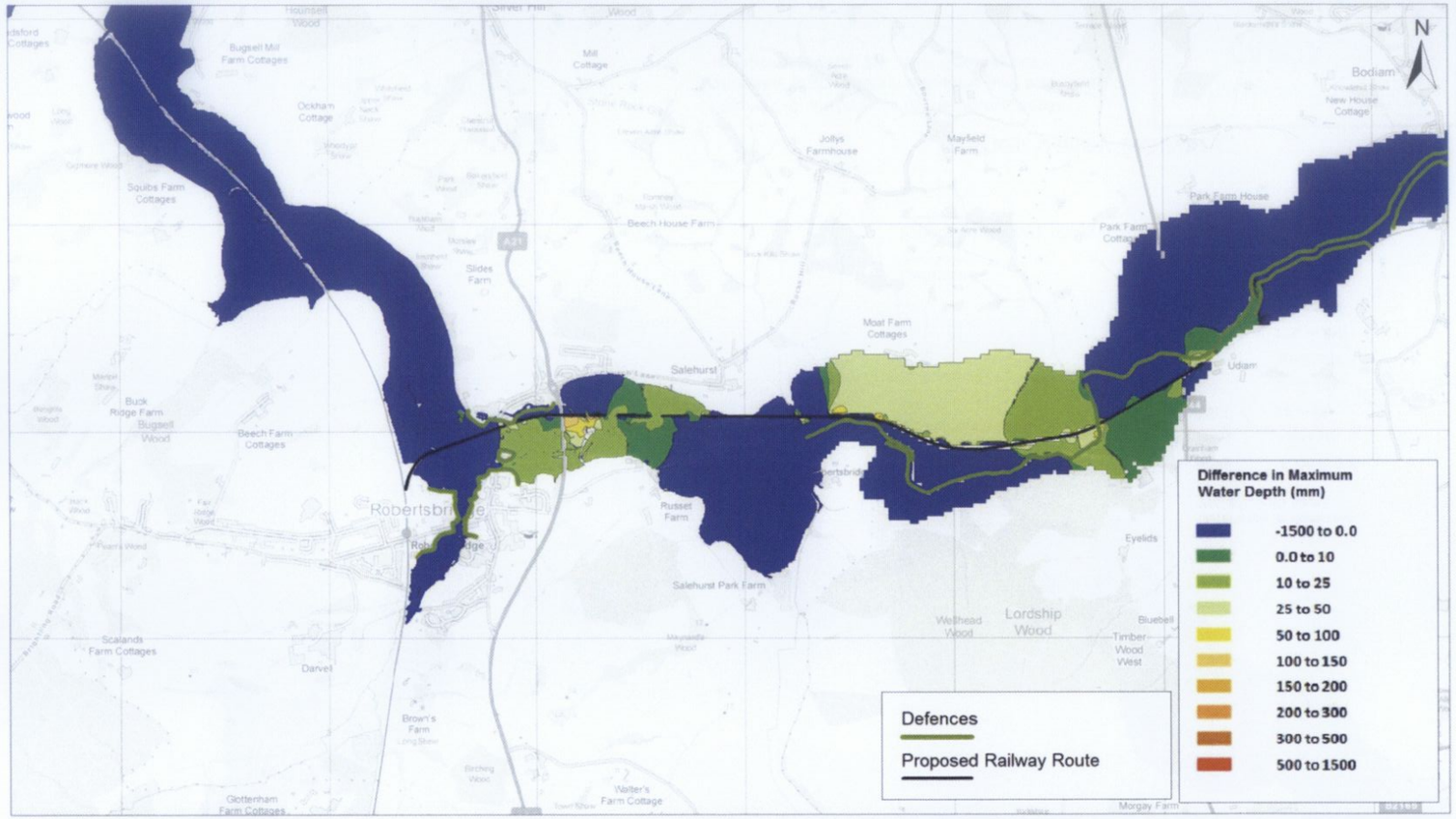

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Figure C-3: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 1.33% AEP flood event

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DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
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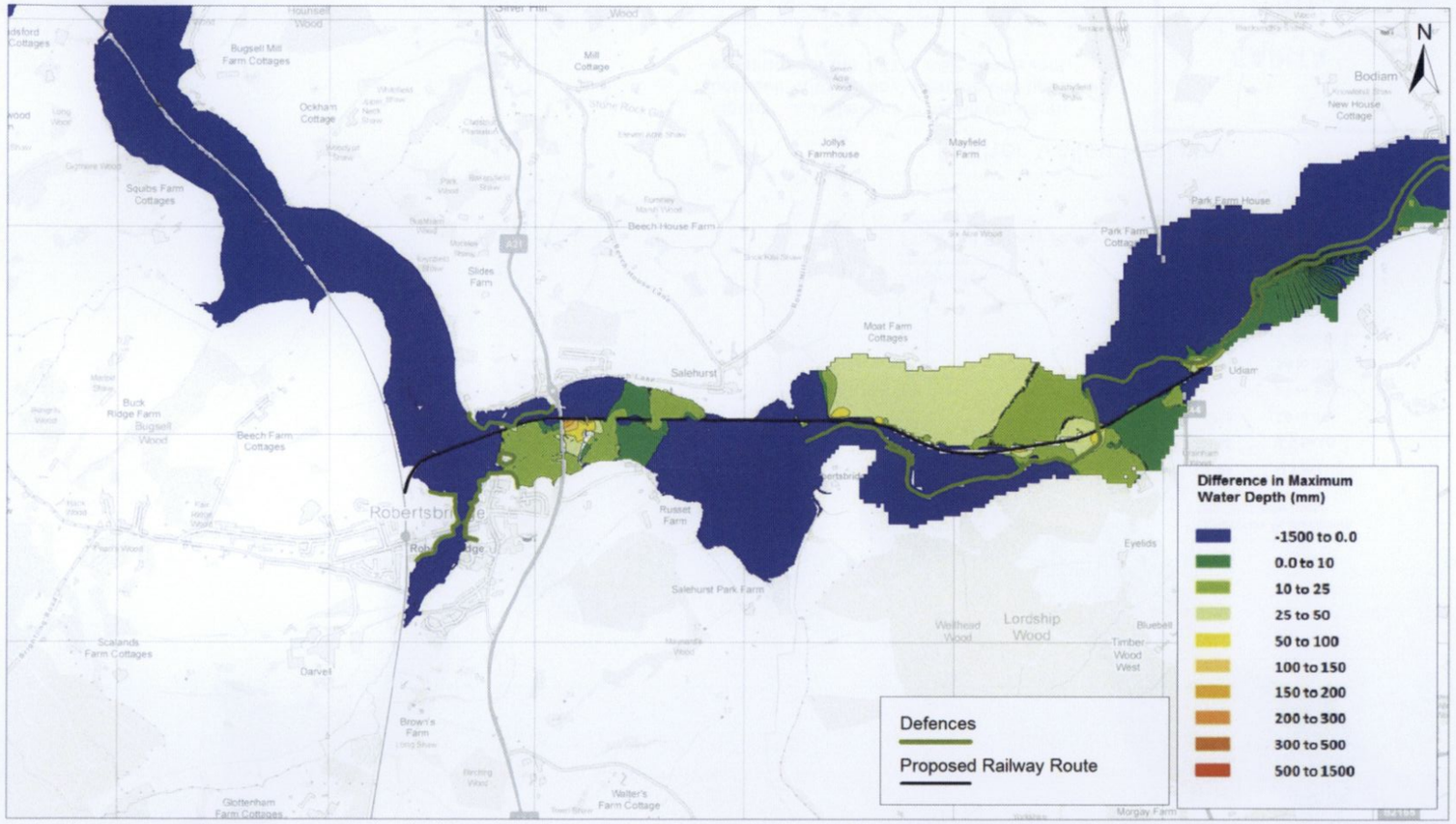

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Figure C-4: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 1% AEP flood event

CAPITA

DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
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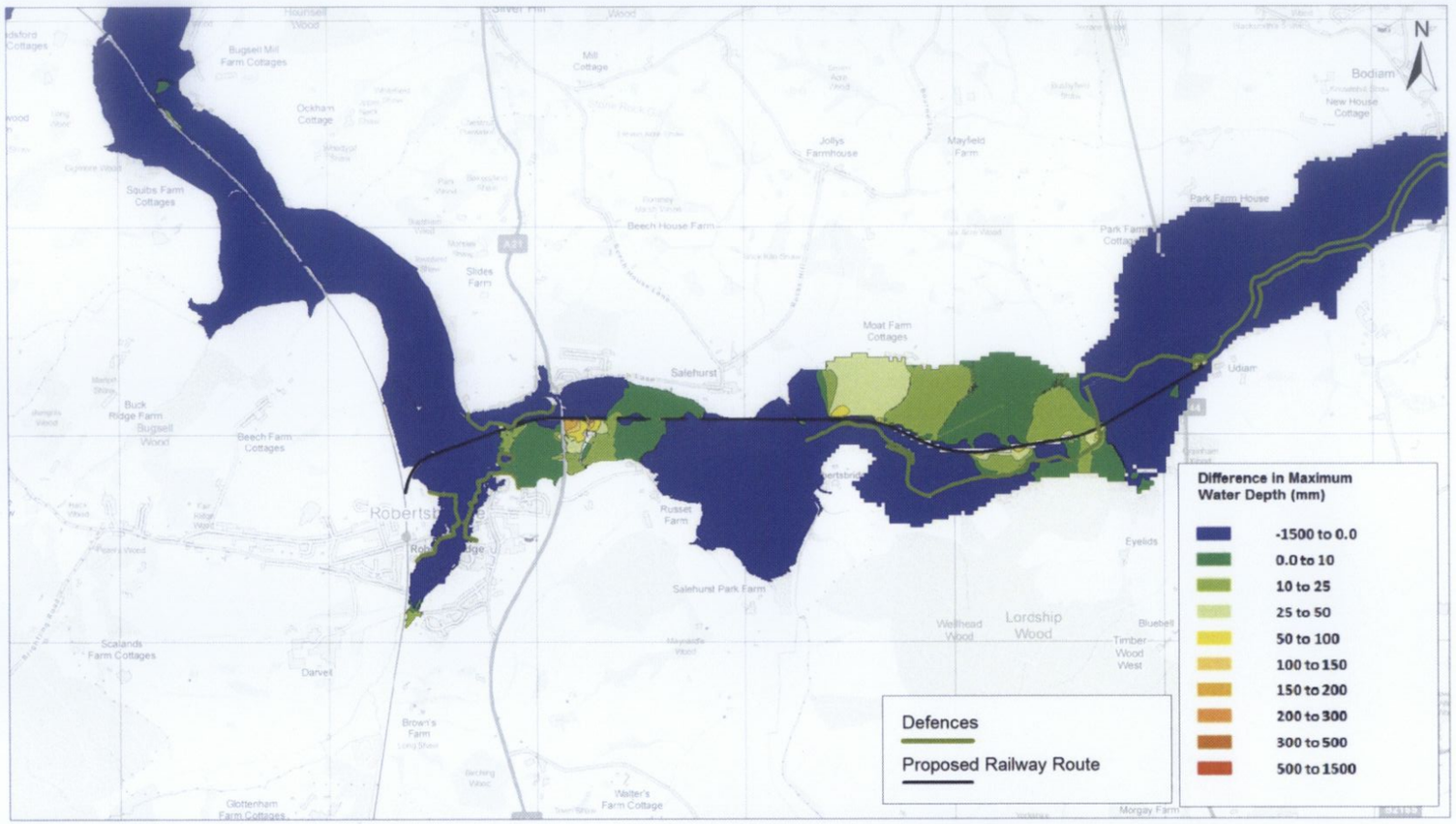

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Figure C-5: Difference in maximum depth between 'with railway' scenario and baseline scenarios for the 1% AEP with climate change flood event

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DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3	ISSUING OFFICE	DRAWING NUMBER	REV
TL	SC	AC	14/06/16	1:25000	E.Grinstead	Figure C-5	2

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