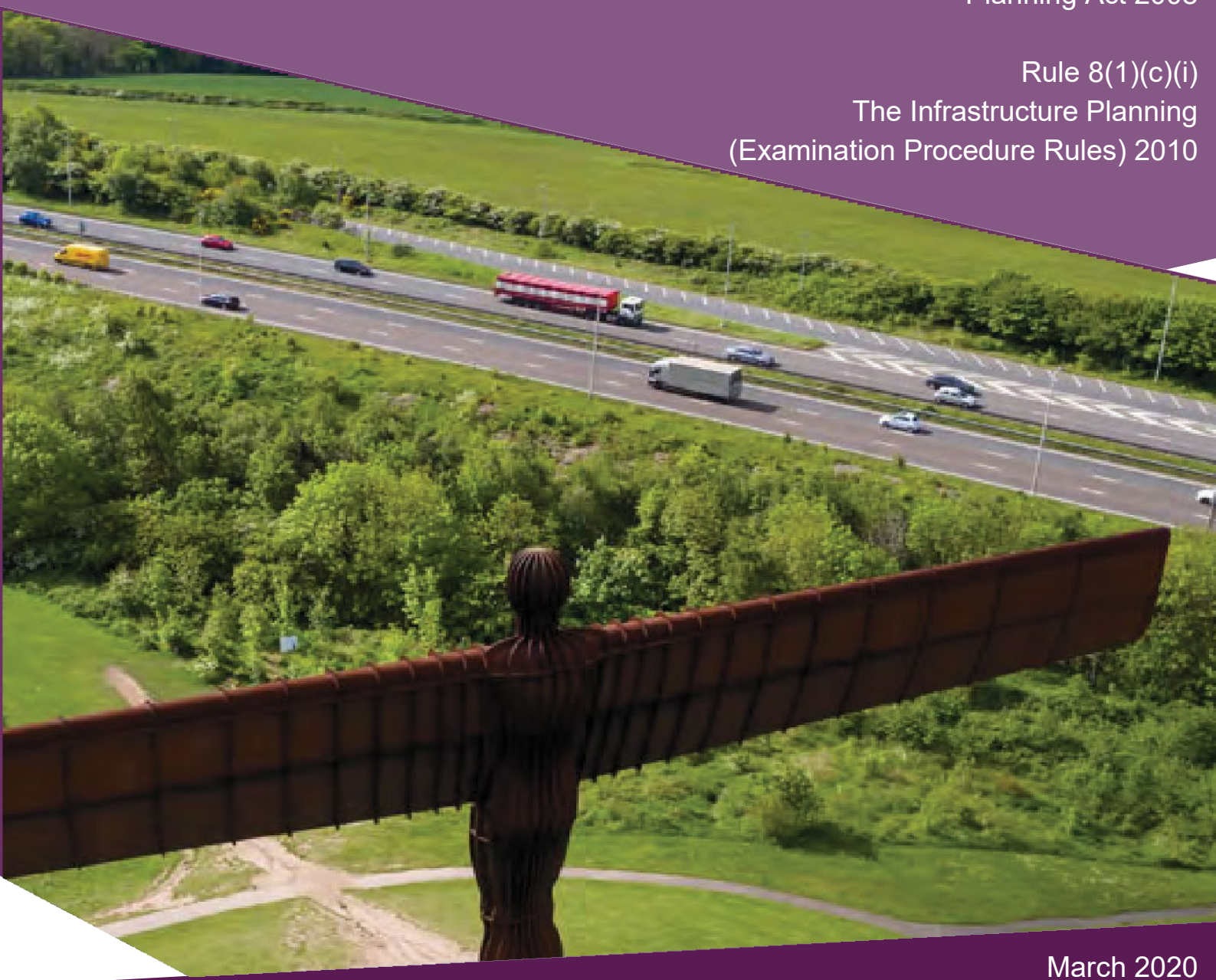
# A1 Birtley to Coal House

# Scheme Number: TR010031

# EXA/D3/003 Applicant's Comments on Responses to EXA's Written Questions

Planning Act 2008

Rule 8(1)(c)(i)
The Infrastructure Planning
(Examination Procedure Rules) 2010



March 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning (Examination Procedure Rules) 2010**

# The A1 Birtley to Coal House

Development Consent Order 20[xx]

## Applicant's Comments on Responses to EXA's Written Questions

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| **Rule Number:** | Rule 8(1)(c)(i) |
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**Table 1.1 – Response from Northern Gas Networks (NGN)**

| WQ Ref | Question to: | Question: | Response from Northern Gas Networks (NGN) | Applicant's comments on the Response |
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| **1.3.12** | Northern Gas Networks | NGN has made a representation [RR-004] regarding the temporary acquisition of its land. At present it does not fully support the application. NGN states that further details of its concerns will be set out in its Written Representation including proposed protective provisions.<br><br>a) The Applicant is asked to explain why CA and/or TP is required and whether or not its needs<br>could be met by any alternative provisions, a lease or other legal agreement relating to NGN Land? | | The Applicant refers to Appendix 1.3 H of the ExA's First Written Questions [REP2-018], submitted at Deadline 2, which addresses this question from the ExA. |
| | | b) NGN is requested to provide further details of its proposed Compressed Natural Gas refuelling station including details of the stage it is currently at in the design, planning and consenting process and a timetable for its implementation? | NGN has invested significant time into the development of the CNG refuelling station. For the reasons we referred to in our Written Representations submitted at Deadline One, there are<br>only a limited number of sites suitable for such refuelling stations.<br><br>We provide a summary of the steps NGN has taken below:<br>(a) June/July 2019 – NGN develops the Opportunity Brief including holding an internal workshop to finalise the brief.<br><br>(b) July 2019 – NGN issued the Lamesley Opportunity Brief (the "Brief"). A copy of this is appended at Annex B to our Written Representations as submitted at Deadline One.<br><br>(c) 16 September 2019 – Deadline for submissions in response to the Brief.<br><br>(d) November 2019 – Following the receipt of submissions, NGN selected ENGIE as the successful applicant.<br><br>(e) ENGIE has taken the steps set out in the letter attached at ANNEX G, which has been produced in support of NGN's evidence. | Generally, the Applicant has no reason to assume that these activities have or have not taken place. Nevertheless, it remains the case that at present there is no live planning application for the CNG refueling station.<br><br>NGN mentions that it would not expect the Applicant to object to its proposals. However, for so long as its understanding of the proposals are incomplete it cannot comment on the generality of the CNG refueling station. Furthermore, if and insofar as the CNG refueling station would impede delivery of the Scheme, which is a nationally significant infrastructure project contained in the Government's Roads Investment Strategy, regrettably the Applicant would indeed object to the CNG refueling station.<br><br>The Applicant notes that NGN has not responded to the ExA's request for the stage that the proposal has reached in the planning and consenting process. It also notes that no timetable for implementation is given. This materially reduces the weight that the ExA can give to the proposal.<br><br>In relation to item g), the Applicant acknowledges that a number of discussions both face to face and via telephone have been undertaken with NGN since August 2019 where NGN have raised the issue of the CNG refueling station.<br><br>Throughout, the Applicant has made clear during these discussions that comments from the Applicant would come |

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| | | | (f) NGN has ensured that the proposed Above Ground Installation which is being constructed as a result of the Scheme has the correct valves installed to accommodate the CNG refuelling station.<br><br>(g) NGN has had various discussions with HE regarding the use of an area of land at Plot 3/6c to facilitate the development of the CNG refuelling station.<br><br>It is our understanding that HE has not raised any objection to the construction of the CNG refuelling station and we would not expect it to raise any major issues at Planning Stage. During the various discussions that have taken place to date, HE has indicated on a number of occasions that it would be prepared to accommodate the CNG refuelling station within its plans, provided that it did not require the land for the scheme. We elaborate on this point at paragraph 7 below. | in two parts. In all relevant conversations, the Applicant has made clear the concern of the impact of the CNG on the Scheme and of NGN retaining the land within the red line boundary which would reduce the space available for the site compound. Concerns have also been raised about the interaction of the CNG station and the Scheme as the intention is for a shared access, this would result in additional traffic with potential clashes. The Applicant highlighted that these issues could result in additional costs and potential programme implications for the Scheme that would not be acceptable.<br><br>Secondly, it has been made clear that the Applicant's Planning Team would be consulted by the Local Authority as part of the planning process for the CNG station. The Applicant's Project Manager for the Scheme is unable to comment on the Planning Team's view as to the CNG station, as they would consider further impacts including the impact on the A1 and possibly junction 67, and this would include both construction and operation of the Scheme. NGN have been advised on a number of occasions that the Applicant's Planning Team are happy to meet with them but without further detailed information about the CNG station, they are unable to give a definitive view of their position The Applicant is willing to discuss matters further to ensure that NGN are aware of all the relevant information/requirements to satisfy the planning process and enable the Applicant's Planning Team to provide an informed opinion on the proposals.<br><br>The Applicant confirms that subject to the additional land being included and accepted within the DCO, the Applicant can accommodate the land NGN is wanting to retain. This does not negate the Applicant's need to be satisfied with regard to the interaction between the CNG station and the Scheme during construction and operation of both schemes in circumstances where NGN have not yet shown how they propose to minimize the impact on the Scheme. It is noted that at the meeting held with the Applicant and NGN on the 29 January 2020, NGN confirmed that they were considering a separate access in to the CNG station which would minimise the interaction between the CNG traffic and the construction traffic. |

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| | | | | Further, the Applicant has also made it clear that if the land NGN require is accommodated, this is not an endorsement of the CNG station by the Applicant. It would still be considered by the Applicants Planning Team in the usual way as described above. |
| | | c) Further details from both parties are also requested providing up to date details of discussions that have taken place regarding the provision for retaining scope for the development of the proposed Compressed Natural Gas refuelling station. | We set out a brief chronology of the pertinent discussions which have taken place to date:<br><br>(a) February 2019 – NGN made aware of drawing HE551462-WSP-GEN-BCH-SK-D- 00011 NGN Sketch 3 (shows the proposed site construction compound) (ANNEX A)<br><br>(b) CPO published - Including Draft CEMP. (ANNEX B)<br><br>(c) 21st August 2019 – NGN held a meeting with HE and Costain to inform them that NGN wished to retain 2.2 acres of land for the purpose of the CNG refuelling station. In<br>February 2019 NGN had created proposed sketch drawing (ANNEX C) to show how all the different elements (i.e. the AGI, CNG station and the temporary construction compound) would fit together. This was not shared with HE until August 2019 as NGN didn't know prior to this if the CNG station was feasible. This sketch was shared at the meeting of 21st August.<br><br>(d) 21st October 2019 – Meeting held with HE and NGN (Derfel Owen, Ian Whitehead and David Gill in attendance) to discuss NGN retaining land for the CNG station<br>.<br>(e) 14th November 2019 - NGN formally objects (via National Infrastructure Planning website) to HE retaining all of NGNs land for the temporary construction compound – the size of the land required for the CNG refuelling station was reduced from 2.2 acres to 1.35 acres following discussions with ENGIE. This was issued to HE and Costain.<br><br>(f) 10th January 2020 – Another meeting | The Applicant has sought to engage with NGN over a protracted period, and Annex B of the Statement of Reasons [APP-016] submitted in updated form at Deadline 2 sets out the current status of negotiations with NGN. Additional information regarding the engagement with NGN is set out below:<br><br>**17 April 2019** - The Applicant's legal team first contacted NGN to discuss and negotiate protective provisions.<br><br>**20 August 2019** – The Applicant received an email from NGN requesting a teleconference to discuss the layout of the temporary construction compound and informed the Applicant that NGN wish to retain approximately 9,000m2 of land for the construction of a CNG filling station.<br><br>**21 August 2019** - As requested a teleconference was arranged with NGN, and NGN made the Applicant aware of their requirement to retain a plot of land to accommodate the proposed CNG station. No plans or further details were submitted on 21 August 2019, contrary to the assertion of NGN. Nevertheless, nothing turns upon this as the principle of the CNG refueling station remains as set out above.<br><br>**26 September 2019** - NGN submitted a plan to the Applicant via email, which NGN confirmed was a rough plan designed to show potential developers the size of land available. The email also stated that at this stage NGN did not have any detailed information as to the appearance of the CNG station.<br><br>**16 October 2019** – As detailed in the Applicant's above response to paragraph 10, the Applicant emailed NGN to detail its concerns relating to the proposed CNG station, request further information (including a detailed plan and timetable) and to request a meeting with NGN. This email followed an initial telephone conversation between the Applicant and NGN where these concerns were raised. |

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| | | | (teleconference) was held between HE and NGN to discuss NGN retaining land for the CNG refuelling station. A senior member of NGN (David Gill) gave an update to:<br>i. Further explain the wider benefits of the CNG plant<br>ii. Provide an update on progress of the CNG refuelling station, including that the project was considered to be viable and that there was considerable momentum getting behind the project.<br><br>(g) 21st January 2020 - Preliminary Meeting takes place in Gateshead. NGN engaged with HE at this meeting and set out again its desired outcome, and the justification behind It.<br><br>(h) Following the prelim meeting HE presented NGN with a further drawing (ANNEX D) which showed NGN retaining the land to accommodate the CNG refuelling station.<br><br>(i) 28th January 2020 – Meeting between WSP, HE, Costain and NGN. This was arranged following the Preliminary Meeting.<br><br>(j) NGN has since been provided with a further drawing for the C2 utilities survey (ANNEXE). This drawing omitted the CNG plant, and NGN have subsequently responded with the drawing at (ANNEX F).<br><br>(k) 12 February 2020 – NGN's solicitors requested additional information from HE, including a detailed plan of the precise layout of the Construction Compound at Plot 3/6c in accordance with the Scheme as currently submitted.<br><br>(l) 19 February 2020 – Over a week later, a response was received from HE's representatives stating that the additional information would be provided 'shortly'.<br><br>(m) 24 February 2020 – No further communication from HE regarding the additional information has been received therefore a further request was | **21 October 2019** – During the meeting between the Applicant and NGN, the Applicant again confirmed their willingness to work with NGN to try to resolve the issue and provide benefit for both sides. Concerns were raised by the Applicant about the impact on the Scheme of NGN retaining this land, and the implications of seeking further land outside the redline boundary were detailed (including the requirement for additional environmental assessment, public consultation and cost implications). Concerns were also raised in relation to the interaction of the proposed CNG station with Scheme construction traffic. NGN confirmed that they would not be involved in the CNG scheme and all detailed design and planning permission would be sought by the CNG developer who would be delivering this scheme. NGN confirmed they had no further detail at this stage that could be provided. The Applicant requested further information with regards to the programme for the CNG works and the anticipated traffic that would use the site, so that the Applicant could consider further the impact on the Scheme.<br><br>**25 October 2019** - NGN sent an email confirming:<br>that the size of the plot for the proposed CNG station had been reduced;<br>an indication of the number of vehicles using the proposed CNG station daily over fiveyears;<br>that there was no firm construction date/programme, but it was expected that the works would run in parallel with the NGN diversion works:<br>that their only involvement was in leasing the land and providing the connection for the CNG station; and<br>that planning permission would be sought by the CNG developer, not NGN.<br>This email was acknowledged by the Applicant on 29 October and it was confirmed that the information provided by NGN would be considered further. However, no further detailed plan, confirmation of programme dates or demonstration of how NGN would ensure usage of the proposed CNG station would not impact on the Scheme during construction have been subsequently provided by NGN. This information was required by the Applicant in order to be able to assess the impacts of the proposed CNG station on the Scheme. |

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| | | | submitted to HE's representatives. At the date of submission (25 February 2020) a detailed site layout has still not been provided. NGN have made it clear that a failure to review a detailed site plan will substantially prejudice NGN's ability to provide evidence in accordance with the Examining Authorities timetable. | **6 January 2020** – Following further discussions between the Applicant and NGN, NGN emailed the Applicant on 6 January 2020 to request a teleconference on 10 January 2020. The Applicant acknowledged this email on 7 January 2020 and confirmed that the information previously sent to the Applicant had been sent to the Applicant's Planning Team, to whom a request had been sent to attend the teleconference. NGN responded by email on 8 January 2020 to acknowledge that a further meeting could be held if not all the Applicant's attendees were available on the 10 January 2020. The Applicant emailed NGN on 10 January 2020 to confirm that the Applicant's Planning Team were unavailable for the teleconference. In addition, the Applicant confirmed that the advice from its planning team was that they would be unable to give a definitive answer as to the Applicant's position without further detailed information. The Applicant offered to rearrange the meeting for a date when its planning team was available, and, in the absence of the Applicant's planning team, the Applicant's Project Manager offered to dial in to the meeting on 10 January 2020.<br><br>**10 January 2020 –** As stated above, the Applicant's Project Manager dialed in to a telephone call with NGN to discuss the CNG station and land requirement. The Applicant acknowledged again the desire to work collaboratively with NGN to resolve this issue. However, the Applicant stated that it still had concerns about the land required, and the interaction with the CNG station during construction of the Scheme. The Applicant confirmed that further detail would be required before the Applicant's planning team would be able to consider the impacts on the Scheme. In particular, an assessment of the impact the proposed CNG station would have on the A1 and junction 67 (Coal House) once the CNG station was fully operational was requested. The Applicant confirmed that they were still willing to arrange a meeting between the Applicant's planning team and NGN but highlighted that the provision of further detail by NGN would be beneficial to the discussion.<br><br>**21 January 2020 –** it is acknowledged that a discussion was held with NGN about the CNG station.<br><br>**29 January 2020 –** it is acknowledged that a meeting was held between Applicant, the contractor for the Scheme and |

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| | | | | NGN. The Applicant confirmed that, subject to the additional land request being accepted within the DCO, NGN may very well be able to retain the plot identified by NGN as being the site of the proposed CNG station. The Applicant also confirmed that, should the variation relating to the additional land not be accepted, the Applicant would require all the land for the construction compound. A copy of the plan of the construction compound as detailed in the Outline CEMP [APP-174] was given to NGN (latest version [REP2-050 and 051]). The Applicant confirmed that the Secretary of State's decision on the DCO is not expected until January 2021, and that the variation would not be confirmed until this point. NGN confirmed that they would need to consider their position further, including discussion with their CNG developer. NGN confirmed that they did not require a meeting with the Applicant's Planning Team until this had been considered. NGN also advised the Applicant that they were considering a separate access track to the proposed CNG station which would keep the traffic away from the Scheme's construction traffic. The Applicant had not previously been advised of this option and awaits further details.<br><br>The Applicant has provided NGN with a plan showing the precise intended layout of the construction compound land, which is contained within the revised CEMP submitted at Deadline 2 [REP2-050 and 051]. |
| | | | Summary of Current Position<br><br>To assist the Examiner, we consider it is helpful to understand the negotiations that have taken place under the heading of three broad themes:<br><br>NGN and HE have cooperated with each other throughout this process to enable NGN to carry out the infrastructure works required to enable the Scheme to be delivered.<br><br>HE has broadly been supportive of NGN's objectives in delivering the CNG refuelling station, and where it considers it to be possible to accommodate the CNG refuelling station within the Scheme, it has indicated a willingness to do so. However, these discussions | The Applicant agrees that NGN have worked collaboratively since 2016 when discussions first commenced about the diversion works required for the Scheme and the use of NGN land for a site compound. Moving the AGI was not a requirement of the Scheme, but to work will NGN and support them with their long-term plans, the Applicant agreed to this additional scope with NGN contributing the difference in costs. Between 2016 and August 2019 NGN were supportive about the use of their land and no issues or concern were raised by NGN who were happy to accommodate the Applicant. During this period discussions commenced with the District Valuer working on behalf of the Applicant and the land agent representing NGN.<br><br>The Applicant was not made aware of the CNG proposal until August 2019 and after the DCO for the scheme had |

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| | | | have been conducted in the context of the amendment which HE has indicated that it intends to make to the DCO redline to include additional land to the south of Plot 3/6c (the "Revised Scheme").<br><br>HE does not consider that the CNG refuelling station can be accommodated within the DCO scheme in the form that is currently before the Examiner (i.e. without the additional land to the south of Plot 3/6c.). We refer to this as the "Submitted Scheme".<br><br>NGN is aware that currently only the Submitted Scheme is under consideration by the Examiner, and consequently NGN has sought on a number of occasions to clarify HE's land requirements in respect of Plot 3/6c both in terms of the size of construction compound required, and the duration of the temporary occupation.<br><br>NGN has repeatedly requested, but not yet received, drawings and construction programmes to justify HE's acquisition of Plot 3/6c within the Submitted Scheme but neither has been provided to date. The only plan which NGN has received in respect of the Submitted Scheme<br>which purports to show the land use requirements of HE is that within the Draft CEMP. We raised our concerns about this drawing in our Written Representations, and do not repeat them Here.<br><br>In failing to provide the information NGN have requested, and in failing to demonstrate why all of the land is required at Plot 3/6c, HE have failed to demonstrate a compelling case in the<br>public interest for acquiring all of the land. HE have not provided any sound reasoning as to why the CNG refuelling station cannot be accommodated and have not been forthcoming in producing an accurate site layout which conclusively states that the station could not be accommodated. Until an accurate representation of the land use at Plot 3/6c is provided, NGNs case remains substantially prejudiced, as a full review is unable to be conducted. | been submitted. It is far from normal that a project such as the Scheme would have a detailed site layout for a works site at the point of application except in the most sensitive of areas, which is not the case in respect of this application. As such, the Applicant disagrees that it has been in any way unhelpful in sharing details of its proposals for the relevant land. The land in question is required for the Allerdene Bridge works, which are one of the most significant elements of the Scheme – as such, it is sensible for NGN to assume a reasonable worst case for the land acquisition. Furthermore, whether or not accepted into the examination, the fact of more land being sought tends to support the intensive use of the land in the Submitted Scheme as matters stand. There is a compelling case in the public interest for the acquisition/temporary occupation of all of the land shown in the Submitted Scheme; there is no need for a detailed site plan at this stage. It is for NGN to show the land is not required.<br><br>The Applicant has made clear its wish to work collaboratively with NGN but concerns about the CNG station and the potential impact on the Scheme have been raised and evidenced in the summary above. The Applicant cannot go sa far as to say it is supportive of the CNG refueling station. Limited information has been provided by NGN with regard to the CNG station other than a basic location plan; an indication of the number of vehicles using the proposed CNG station daily over 5 years; there is no firm construction date/programme, but it was expected that the works would run in parallel with the NGN diversion works; that their only involvement was in leasing the land and providing the connection for the CNG station; and that planning permission would be sought by the CNG developer, not NGN. When asked, NGN have stated that they cannot provide any more detail or specific dates. The Applicant has made it clear from August 2019 when the Applicant was made aware of the CNG station, of the difficulty of accommodating their proposal after DCO submission. This also follows the completion of environmental assessment which have been based on the submitted scheme and the need for the NGN land. The Applicant has raised with NGN the potential cost and programme increase to the Scheme if additional land had to be sought which is not acceptable and not affordable. |

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| | | | As stated in NGNs Written Representations, HE have been aware of the CNG refuelling station proposal for an extended period of time and have not raised any substantive objections, other than the issue of land take. It is our understanding that HE are fundamentally in agreement with NGN's proposal for a CNG refuelling station and we are aware that the HE would in fact be happy to accommodate the station should additional land become available for use as a construction compound, indicating that the proposal could operate in tandem with the Scheme.<br><br>HE's failure to engage and work towards a layout which accommodates both parties is compounded by the fact that CNG refuelling station is of significant public interest. Failure to accommodate NGN's request, or provide any justification for doing so will have major adverse effects moving forward. | The Applicant has provided a layout plan in the latest iteration of the CEMP, submitted at Deadline 2 [REP2-050 and 051], outlining the proposed use of the site compound and exactly why the full extent of land is necessary. The Applicant is willing to discuss this in further detail with NGN to reach a solution that allows both schemes to work in tandem, subject to an application being forthcoming from the CNG developer which allows the Applicant to engage with and be consulted on the relevant interface with the Scheme. |

**Table 1.2 – Response from Historic England**

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| **1.0.2** | Gateshead Council, Sunderland City Council, Environment Agency, Natural England and Historic England | **1.0 General and Cross Topic Question**<br><br>The outline Construction Environmental Management Plan (CEMP) [APP-174] including the Record of environmental actions and commitments (Table 3-1) and outline Construction Traffic Management Plan (CTMP) (Appendix B) includes measures to avoid, prevent, reduce or, where possible and appropriate, offset the potential environmental impacts associated with the construction of the Proposed Development.<br><br>Please comment on the acceptability of the outline CEMP including any potential amendments or additions that may, in your view, be required. Provide appropriate justification for any amendments or additions sought. | In our Written Representations (REP1– 012 at paragraph 6.5) Historic England commented on some modifications that we have discussed with the Applicant to the Outline CEMP to ensure that it will protect the Historic Environment and is fit for purpose. Specifically, we would like to see changes to CH2, CH3, CH5, CH6 and N8. We set out our proposed amendments in detail in Appendix 7 of our Written Representations. | The response at paragraph 6.5 in REP1-012 regarding the refinement of wording in the CEMP is noted. All the changes recommended by Historic England to the CEMP were drafted into the revised draft DCO submitted at Deadline 2 [REP2-050 and 051]. |
| **1.4.1** | IPS other than The Applicant | **1.4 Draft DCO**<br><br>With respect to matters raised in Relevant Representations or Written Representations 1 but which were not discussed in ISH1 and in your view require changes to the DCO please identify any changes that you require, referring to Articles, Requirements and any other provisions as necessary.<br><br>Provide your preferred drafting where possible and explain why it is proposed and what it aims to achieve.<br><br>Please cross-reference responses to this question to your Relevant Representation, Written Representation and to other questions in ExQ1 as necessary. | In our Written Representations REP1-012 at paragraphs 6.2 – 6.4) Historic England set out the issues in relation to the draft DCO regarding Article 39; Schedule 2 (Part 1) (Requirement 9); and, to Schedule 10. We considered that changes are required to these provisions in order to clarify exactly what and how works are to be carried out to the Scheduled Monument of the Bowes Railway<br><br>**Article 39:** (see Appendix 7 of Written Representations) authorises the undertaker to carry out specified works to the Monument as set out in Schedule 10. However, no methodology and approach as to how these works are to be carried out are provided for in Schedule 10. We suggested amendments in the draft outline CEMP were required.<br><br>**Schedule 2 (Part 1) (Requirement 9):** lacks clarity and may cause confusion in the carrying out of the works should consent be forthcoming. We have set out in Appendix 5 of our Written Representations our proposed amended wording for consideration.<br><br>**Schedule 10:** Historic England considers that this schedule lacks clarity regarding the extent of demolition proposed to the Scheduled Monument of | Historic England seeks three sets of changes to the DCO and CEMP:<br><br>1) Revisions to the CEMP to give more specification of the methodology for carrying out the works required to the scheduled monument. These requested changes were made in the updated version of the CEMP circulated at Deadline 2 [REP2-050 and 051].<br><br>2) Revisions to Article 39 and Schedule 10, again to give more specification to the description of the works required to the scheduled monument. At Deadline 2, the Applicant advised that further to the extent to which it was possible at this stage of the Scheme to give such specification,<br><br>Historic England requested that Schedule 10 be altered to state:<br>• Demolition of stone retaining walls (up to a maximum of 17m in length)<br><br>Following clarification of the maximum extents required, the next iteration of the draft DCO at Deadline 4 will include the revisions requested by Historic England, above (latest version [REP2-044 and 045]). |

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| | | | the Bowes Railway. We have set out in Appendix 6 of our Written Representations our understanding of the extent of demolition proposed and would like to see Schedule 10 amended to reflect this more accurately. | 3) Further clarity on the procedures in Requirement 9. The Applicant has sought to incorporate the issues raised by Historic England in relation to Requirement 9. However, as explained in the submissions lodged at Deadline 2 [REP2-061], the difficulty with the drafting proposed by Historic England is that it does not have an equivalent to Requirement 9(6) which means that there would be no requirement to complete further investigation works before re-commencing the development. Hence, the Applicant has retained the existing drafting and sought to build in the points raised by Historic England. |
| **1.5.5** | The Applicant and Historic England | In ES Appendix 4.1 [ABoPP-103], the Applicant states that it: "…is in discussions with Historic England in order to obtain a Letter of No Impediment with the aim to include Scheduled Monument Consent within the Development Consent Order". Noting that consent for works to the Bowes Railway Scheduled Monument is sought through the DCO (Article 39 and Schedule 10), can the Applicant and Historic England provide an update regarding progress towards agreeing any such Letter of No Impediment? | The Applicant did request that Historic England sign a "Letter of No Impediment" as noted above. However, in view of the issues that we raised which we considered the Applicant needed to address we have not signed this letter. We are currently awaiting Highways England response to our discussions with them on the points we have raised. | Historic England's response to the request for a 'Letter of No Impediment' is noted. However, please note the Applicant's response to this question [REP2-060]. It is considered that a Letter of No Impediment is not required. Discussions are ongoing and outcomes will be recorded in the SoCG. |
| **1.5.6** | Applicant | To mitigate the loss of part of the retaining wall associated with Bowes Railway Scheduled Monument, ES paragraph 6.9.10 [APP-027] states that Historic England have requested that another section of the surviving wall associated with Bowes Railway Scheduled Monument of equal length to that being demolished is repaired. It is proposed that the section of retaining wall to be repaired and the repointing and conservation methodology would be agreed with Historic England. | We note that this is a question that has been put to the Applicant and await their response and will comment on it if appropriate. As set out in our Written Representations REP1-012, we consider that there needs to be greater clarity in relation to the walling to be repaired. | Amendments have been made to the CEMP [REP2-050 and 051] and these are discussed in more detail below. |
| | | a) Can the Applicant provide further details and a framework of what is<br>proposed in this regard and at what point in the programme these works<br>would be implemented? | | The amendments to the Outline CEMP, as requested by Historic England in their written representations (specifically Appendix 7), were included in the revised Outline CEMP submitted at Deadline 2 [REP2-050 and 051]. These changes secure the delivery of the repair works and detail the timing of the works.<br><br>In addition, further detail in regard to the repair works |

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| | | | | will be included in the detailed Outline WSI compiled in consultation with Historic England and the Tyne and Wear Planning Archaeologist. |
| | | b) Schedule 10: Scheduled Monuments of the DCO [AS-012] does not currently include the mitigation to repair sections of the retaining wall associated with Bowes Railway Scheduled Monument. Can the Applicant confirm how delivery, including timing, of these works would be secured through the DCO? | | The provision for mitigation of the retaining wall is secured through the CEMP [REP2-050 and 051] as opposed to the DCO [REP2-044 and 045]. This is explained in further detailed in the Appellant's response to the written questions lodged at Deadline 2 – see in particular [REP2-060]. |
| **1.5.8** | Historic England | Article 39 of the DCO [AS-012] includes authorisation for the works specified in column 2 of Schedule 10 to be carried out.<br>Historic England are requested to comment on whether any further details are required, including with regard to mitigation, in connection with the proposed works to the Bowes Railway Scheduled Monument. | We commented on Article 39 and Schedule 10 in our Written Representations REP1-012 see paragraphs 6.2 and 6.4 and Appendices 6 and 7 which set out our position on the matter | The comments in paragraphs 6.2 and 6.4 of REP1-012 are noted. Further to which the changes to the CEMP as detailed in Appendix 7 were included in the revised Outline CEMP submitted at Deadline 2 [REP2-050 and 051].<br><br>Further to the clarification of maximum extents required, the revisions requested in Appendix 6 will be included in the next iteration of the draft DCO to be submitted at Deadline 4 (latest version [REP2-044 and 045]. |
| **1.5.9** | Applicant | Table 3-1 (Ref CH2) of the REAC [APP-174] sets out the measures proposed to be included within the Written Scheme of Investigation (WSI). These would include a mitigation strategy for the impact on the Bowes Railway as well as other potential archaeological remains.<br>The Applicant is requested to submit an outline WSI that has been agreed with Historic England and the LPA setting out the principles to ensure the protection of the archaeological resource and a summary of the necessary archaeological mitigation measures. | We note that this is a question that has been put to the Applicant and await their response and will comment on it if appropriate. As set out in our Written Representations REP1-012 (see paragraphs 5.11-5.13 and 6.5) we set out the need for a clear archaeological strategy for the historic environment which is appropriately designed, implemented and manageable and provided amendments for consideration in our appendices. We also provided an example of what we expect the WSI to look like (see Appendix 4 of Historic England Written Representations). We discussed the matter further with the Applicant and their agents at a meeting on 30 January 2020 and are currently waiting for a response from the Applicant. | We acknowledge Historic England's requirement for 'a clear archaeological strategy...which is appropriately designed, implemented and manageable...'. As such, an Outline WSI has been drafted and will be sent to both Historic England and the Tyne and Wear Archaeological Officer for comment. Once the content of the document has been agreed it will be submitted to the Examiner at Deadline 4. |

**Table 1.3 - Response from Sunderland City Council**

| WQ Ref | Question to: | Question: | Response from Sunderland City Council | Applicant's comments on the Response |
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| **1.01** | Sunderland City Council | Chapter 5 of the Applicant's Planning Statement [APP-171] includes an assessment of the relevant local planning and transport policies.<br><br>a) Which documents constitute the Development Plan for each local authority area? | a) The Core Strategy and Development Plan (2015-2033) for Sunderland was adopted by the Council on 30 January 2020. | Noted |
| | | b) Do you agree with the list of relevant policies set out by the Applicant in this document? Are there any additional policies you consider to be relevant to the proposal? If so, please provide them along with a justification for their relevance. | b) The policies referred to appear relevant. | Noted |
| | | c) Are there any relevant emerging policies? If so, what is their current stage in the plan adoption process? | c) The Tyne and Wear Local Transport Plan referred to in Chapter 1 of the Environmental Statement is proposed to be replaced by the North-East Transport Plan. This is currently being drafted on behalf of the North East Combined Authority (NECA) Joint Transport Committee. The Plan is intended to support the North-East economy, air quality, public health, modal shift; and a timeline of transport projects to be delivered. | Noted |
| | | d) Please provide copies of all relevant adopted and emerging policies. | d) Due to the size of the documents relating to the Core Strategy and Development Plan (2015-2033) for Sunderland, please use the following link if required: https://www.sunderland.gov.uk/CSDP | Noted |
| **1.0.2** | Sunderland City Council | The outline Construction Environmental Management Plan (CEMP) [APP-174] including the Record of environmental actions and commitments (Table 3-1) and outline Construction Traffic Management Plan (CTMP) (Appendix B) includes measures to avoid, prevent, reduce or, where possible and appropriate, offset the potential environmental impacts associated with the construction of the Proposed | Sunderland are supportive of the objectives of both the outline CEMP and REAC.<br><br>Additions or amendments may be required; and will be subject to ongoing discussions with the applicant regarding both of these documents as well as the outline CTMP. | Noted and the Applicant is happy to discuss the CEMP, REAC and CTMP [REP2-050 and 051] further as part of the detailed design process. |

| WQ Ref | Question to: | Question: | Response from Sunderland City Council | Applicant's comments on the Response |
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| | | Development.<br><br>Please comment on the acceptability of the outline CEMP including any potential amendments or additions that may, in your view, be required. Provide appropriate justification for any amendments or additions sought. | | |
| **1.0.15** | Sunderland City Council | A long list and short list of proposed developments used to assess cumulative effects are presented in Appendices 15.1 [APP-167] and 15.2 [APP-168] of the ES.<br><br>a) Have these lists been agreed with the relevant local authorities?<br><br>b) Have any more relevant proposed developments been identified since the drafting of these documents? | a & b) Sunderland are content with the study area identified within the Environmental Statement. However, in terms of the Long List of Proposed Developments (Appendix 15.1) and the Short List of Planning Application (Appendix 15.2). Consideration should be given to a proposed residential development of circa 60 dwellings on land at Mount Lane in south-west Springwell Village. This site is identified within Sunderland's Core Strategy and Local Plan (Site Ref HGA1). | Following a review of Sunderland City Council Core Strategy and Development Plan 2015-2033 for Site Ref HGA1, it was identified that this development is outside the study area for the cumulative assessment. It is not anticipated there will be any cumulative impacts with the Scheme as a result, therefore, it has been scoped out of the cumulative assessment. |
| **1.1.1** | Sunderland City Council | The Applicant's air quality assessment is set out in Chapter 5 of the ES [APP-026].<br><br>Do the Councils agree with the impacts scoped out of the assessment in paragraphs 5.4.8 and 5.4.9? | In terms of the scoping assessment undertaken for air quality; the initial assessment of construction traffic routes as set out in paras 5.4.8 and 5.4.9 of chapter 5 of the Environmental Statement is accepted. However, it is noted that some construction traffic routing may alter if the proposal for stockpiling material on adjoin parcel of land is accepted and progressed. | Noted. The effects as a result of the use of additional land will be dealt with in a separate addendum. |
| **1.4.1** | Sunderland City Council | With respect to matters raised in Relevant Representations or Written Representations but which were not discussed in ISH1 and in your view require changes to the dDCO please identify any changes that you require, referring to Articles, Requirements and any other provisions as necessary. Provide your preferred drafting where possible and explain why it is proposed and what it aims to | Sunderland provided initial comments on the draft DCO at deadline 1 (SCC letter dated 04/02/2020) following review by SCC legal and highway officers. No further comments are anticipated. | Noted |

| WQ Ref | Question to: | Question: | Response from Sunderland City Council | Applicant's comments on the Response |
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| | | achieve.<br><br>Please cross-reference responses to this question to your Relevant Representation, Written Representation and to other questions in ExQ1 as necessary. | | |
| **1.9.1** | Sunderland City Council | The application is accompanied by a Transport Assessment Report (TAR) [APP-173].<br><br>Do the Council's agree with the content and findings of the TAR? Provide reasons for any disagreement with any aspect of it. | Sunderland intend to provide more feedback on Transport Assessment Report including a review of the A1231/B1288 Mill House roundabout. At this moment, Sunderland wishes to reserve its position on the acceptance of the TAR. | Noted |
| **1.9.2** | Sunderland City Council | Paragraph 1.1.1 of the Construction Traffic Assessment [APP-108] states that the routes used to access the construction site and the additional flows generated during construction are scoped out of further consideration for further assessment.<br><br>Do the local authorities agree with the conclusions of this document? | In terms of the routes identified for construction traffic, it is noted that A1231/B1288 Mill House roundabout junction in Sunderland has been assessed. The link/gateways W06, W07 and W08 are predicted to accommodate 97 trips through the junction per day for both the viaduct and embankment options. The assessment is accepted; however, it is noted that some construction traffic routing may alter if the proposal for stockpiling material on adjoin parcel of land is accepted and progressed. | Noted. The effects as a result of the use of additional land will be dealt with in a separate addendum. |
| **1.9.3** | Sunderland City Council | The outline CEMP [APP-174] includes an outline CTMP (Appendix B). Details of construction phase traffic diversions have been provided in Appendix 11.12 of the ES [APP-156].<br><br>Submissions from the Councils are requested with regard to the adequacy of content of the outline CTMP with particular regard to managing and mitigating the effects of construction traffic within the respective Council areas. | Sunderland has requested that the applicant review some content of the Construction Traffic Management Plan including construction worker trips.<br><br>Sunderland has discussed with the applicant the benefits of communications plan for notifying residents and businesses during construction phase. This will mainly be relevant to the closures planned for the A194(M) both north and southbound between junction 65 (Birtley) to Havannah interchange. It is recommended that a Traffic Management Working Group be established with key stakeholders invited to attend. This approach has been adopted by the applicant for the A19/A184 Testo's major project currently under construction. | The Applicant has agreed to set up a Traffic Management Working Group as proposed.<br><br>The outline Construction Traffic Management Plan (CTMP) has been amended and submitted as Appendix B to the outline Construction Environmental Management Plan [REP2-050 and 051]. The CTMP has been amended as follows:<br>• Paragraph 4.2.9 has been amended to clarify that the catchment area for construction worker trips includes Sunderland. Sunderland has been disaggregated by Middle Layer - Super Output Area resulting in 36 zones with trips assigned between each zone and the Scheme.<br>• Paragraph 3.2.5 – 3.2.6 sets out a commitment to a working group being established. It is proposed that the working group will discuss and manage interaction between the Applicants schemes, and any other major |

| WQ Ref | Question to: | Question: | Response from Sunderland City Council | Applicant's comments on the Response |
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| | | | | road or non-road schemes that come forward.<br><br>The outline CTMP will continue to evolve throughout the construction of the scheme to respond to changes associated with the construction programme, and interaction with other road schemes, non-road schemes, and major events. |

**Table 1.4 - Response from Environment Agency**

| WQ Ref | Question to: | Question: | Response from Environment Agency | Applicant's comments on the Response |
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| **1.0.2** | Gateshead Council, Sunderland City Council, Environment Agency, Natural England and Historic England<br><br>(note EA letter refers to Q1.0.3 but this is for Applicant only in relation to structures so assumed this should be 1.0.2) | The outline Construction Environmental Management Plan (CEMP) [APP-174] including the Record of environmental actions and commitments (Table 3-1) and outline Construction Traffic Management Plan (CTMP) (Appendix B) includes measures to avoid, prevent, reduce or, where possible and appropriate, offset the potential environmental impacts associated with the construction of the Proposed Development.<br><br>Please comment on the acceptability of the outline CEMP including any potential amendments or additions that may, in your view, be required. Provide appropriate justification for any amendments or additions sought. | Fish species, great crested newt and otter are protected species and receive protection through varies pieces of legislation. These species have been found to be present or potentially present at the proposed development site. In addition, Invasive Non-Native Species (INNS) have also been found to be present on site and have been identified as requiring management.<br><br>The Outline Construction Environmental Management Plan (CEMP) details a number of measures in which those species listed above would be protected and invasive species managed. In our previous response, we outlined the need to condition the Detailed CEMP and that protection of sensitive receptors needs to be taken into consideration at all times during works.<br><br>During this specific review we have noted details of the Outline CEMP and where appropriate we have detailed where further consideration is required.<br><br>These considerations should be incorporated into the updated Outline CEMP and the Detailed CEMP.<br><br>With respect to table 3-1(register of environmental actions and commitments), we recommend the following additions: | The Environment Agency's comments regarding G1, G6, B3, B9 and W12 are agreed (other than in relation to the comments on B9 which relate to watercourse diversion discussed below) and will be added to the Outline CEMP. The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. |
| | | | G1 - We note that upon the finalisation of the Outline CEMP to the CEMP, the Local Authority and Secretary of State will be consulted. We ask that the Environment Agency also be consulted in order to ensure our comments have been considered and included into the CEMP. | Agreed – this will be added to the Outline CEMP. The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. |
| | | | G6 - G6 gives sufficient detail on the need for a suitable lighting strategy to protect fish species during construction activities and upon completion of works. Given the presence of otter identified on the river and included in the Environment Impact | Agreed - this will be added to the Outline CEMP. (latest version [REP2-050 and 051]). The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. |

| WQ Ref | Question to: | Question: | Response from Environment Agency | Applicant's comments on the Response |
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| | | | Assessment (EIA), this species should be referenced in the CEMP to allow them to be considered in any lighting strategy. | |
| | | | B3 - This statement on fish passage in culverts should be clarified in order to ensure fish passage is maintained at all times, use of the term 'where possible' could imply that fish passage is beneficial but not mandatory. Fish passage needs to be in place at all times.<br>The statement could be reworded as follows:<br><br>"Culverts will be designed taking into account fish migratory requirements to ensure that they do not present an obstruction to fish migration."<br><br>Appendix A of this response contains guidance notes for new culverts, this can be referenced when constructing culverts in the channel in relation to fish. This provides information which may be useful during design as well as construction.<br><br>Details and location of baffles or similar structures, e.g. pre barrages, to be installed either within or close to existing culverts for fish passage will need to be agreed with the Environment Agency.<br><br>Natural beds within culverts will be beneficial creating habitat and preventing incision. Every effort should be made to include this into the designs. | Agreed – this will be added to the Outline CEMP. The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. |
| | | | B9, B10 and W15 - Any watercourse diversion work, coffer dams or other in-channel works must ensure fish passage is maintained and designed in such a way as to allow fish movement at times they are actively migrating.<br>This includes maintaining adequate space and depth of water, as well as flow velocity, for fish passage.<br><br>October to May inclusive, is the fish spawning period to avoid, rather than September to April. | The mitigation for the Scheme has been designed in order to accommodate measures to protect migrating fish.<br>• B9 – Addresses the monitoring requirements for construction activities and states that the consents required for these works would require monitoring.<br>• B10 – Addresses the temporary culverting of the River Team and other culverts / outlets, that may require modification as part of the Scheme. The Outline CEMP provides a commitment to |

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| | | | | undertake these works outside the times at which the fish are actively migrating. This will be updated, from September to April to October to May in the updated Outline CEMP. This will be added to the next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. No impact on the migration of fish will occur, as the culvert will be designed as far as practical to maintain the current space, depth and velocities. The timeframes detailed within the CEMP [REP2-050 and 051] have been updated to reflect those within the EAs response.<br>• W15 – Addresses the potential need for coffer dams on the watercourses such as the Allerdene Burn. Only three watercourses are being directly impacted by the construction works, the River Team (as outlined above), the Allerdene Burn and the southernmost watercourse at Smithy Lane overbridge plus construction of new outfalls at watercourses where they are required.<br><br>Generally, measures to address this concern and other considerations include:<br>• The installation and removal of the culvert within the River Team will be timed to avoid times of fish passage as detailed in the Outline CEMP [REP2-050 and 051] [B10]. Therefore, fish passage will be maintained within the River Team during construction works.<br>• The new outfalls will be set back from the watercourses as detailed in [W10] of the Outline CEMP [REP2-050 and 051], and thus should not have an impact on flows for a prolonged period of time and can be programmed around fish passage as required, thereby maintaining fish passage.<br>• Allerdene Burn – upstream of the Scheme the burn becomes predominantly culverted, not including the culvert under the Scheme. Fish |

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| | | | | passage in this area would be limited in any event.<br>• The southern watercourse at Smithy Lane overbridge, requires a small extension to accommodate the widening. There is a significant culvert downstream (approximately 400m beneath the railway land) and a small upstream catchment, approximate longest drainage path 1.5km through an urban area, therefore fish passage is not considered to be a significant issue within this watercourse. |
| | | | B9 - Current and up to date ecological survey work will be needed to inform any Environment Agency Flood Risk Activity Permit under the Environmental Permitting (England and Wales) Regulations 2016. This should be included as a requirement within the in the CEMP to ensure inclusion and to prevent any delays during permit applications.<br><br>As part of an application the Environment Agency will assess the submission in relation to Fisheries, Biodiversity and Geomorphology, we'll also assess its compliance with the Northumbria River Basin Management Plan (RBMP). The RBMP states that the water environment should be protected and enhanced to prevent deterioration and promote the recovery of water bodies. It is advised that the development design a scheme which will help meet objectives and to promote the recovery of water bodies. | Agreed – this will be added to the CEMP. The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. |
| | | | W3 - As detailed in reference W10, opportunities for attenuation storage design that also benefits species and habitat creation should be included into the CEMP to ensue consideration and later stages in the Scheme. | L13 of the Outline CEMP [REP2-050 and 051] details that the planned attenuation pond will be enhanced through additional tree planting and areas of scrub to provide improved habitat connectivity.<br><br>The drainage design has included Sustainable Urban Drainage System (SUDS) measures where possible. The attenuation pond has been designed to be first and foremost a balancing pond to accommodate the volume required without adverse impacts on the landscape and biodiversity. For the attenuation pond |

| WQ Ref | Question to: | Question: | Response from Environment Agency | Applicant's comments on the Response |
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| | | | | to cover a greater area than the current design, a more extensive adverse impact on on the existing landscape would occur. This would include the increased land-take from the existing woodland area adjacent to the proposed location of the attenuation pond, resulting in a greater loss of priority habitat. Further opportunities to benefit species and for habitat creation will be investigated at detailed design and this commitment will be provided in the updated Outline CEMP at [L13]. The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. |
| | | | W10 - It is positive to see that there is opportunity for river restoration included within the CEMP for options in relation to the Allerdene Burn.<br><br>Any design at this location should have input from a suitably qualified geomorphologist in order to ensure a suitable design is brought forward that maximises the morphology of the channel and riparian zone for habitats and wildlife.<br><br>The following should also be considered:<br>• There are two options for the reinstatement for the Allerdene Burn, an updated culvert with greater capacity (embankment option) or an open channel (viaduct option). Both options at detailed design stage will need to be designed in such a way as to maximise environmental benefits:<br>• For the Allerdene embankment option, there would be a re-engineered culvert. There are in-channel improvements which can be made to increase the flow diversity of the modified channel, which can in turn affect the morphology of the channel and therefore the biodiversity of the channel. This needs to be considered in any detailed design.<br>• The Allerdene viaduct option, the Allerdene Burn is noted to be realigned as part of the scheme. There is an opportunity to realign this in such a manner as to work with natural | Input from a suitably qualified geomorphologist:<br>• Additional text will be included in the updated Outline CEMP at [W10] to clarify that geomorphological aspects will be incorporated into the design by a suitably qualified geomorphologist. The design will ensure that the morphology of the channel and the riparian zone for habitats and wildlife is maximised in the context of the Scheme as a whole. The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051].<br><br>Allerdene Burn design options:<br>• It is confirmed that, where feasible, opportunities to maximise environmental benefits for Allerdene Burn will be considered at detailed design.<br>• The outline CEMP [W10] [REP2-050 and 051] provides details on the design points which includes that "potential opportunities have been identified to improve the channel design and to provide enhancement to the river environment and morphology by, for example, inclusion of pools and riffles (or similar features to increase biodiversity) constructing a two-stage channel, adopting bioengineering techniques, such as rock rolls and mattresses, to maintain the |

| WQ Ref | Question to: | Question: | Response from Environment Agency | Applicant's comments on the Response |
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| | | | processes in order to gain a more diverse fluvial system than a uniform straight section of channel. This needs to be considered in any detailed design as opposed to an open ditch.<br>• For both the viaduct and embankment options, it is noted that flow control measures will transfer water from the channel out onto the floodplain during a 1% event. The design of the channel and the adjacent floodplain could allow more frequent flooding, with the potential to trap and store fines and nutrients, help reduce downstream flooding and benefit local biodiversity. We would welcome proposals as to how this may be achieved. | channel profile and by re-vegetating the banks of the proposed channel realignment. These, and further potential enhancements, will be considered at the detailed design stage of the Scheme".<br>Allerdene Embankment Option:<br>• It is confirmed that, where feasible, opportunities to provide in-channel improvements in order to provide improvements with regards to biodiversity will be considered at detailed design. These aspects will be considered alongside potential implications to flood risk.<br><br>Allerdene Viaduct Option:<br>• It is confirmed that, where feasible, opportunities to realign Allerdene Burn in such a manner as to gain a more diverse fluvial system will be considered at detailed design. These aspects will be considered alongside potential implications to flood risk.<br><br>Flow Control Measures:<br>• The flood regime - in terms of the design, the existing channel is highly engineered and not natural, and, whilst the Applicant has sought to improve upon the current conditions, there are many constraints that need to be considered. The main constraint to changes to the channel are land ownership, as the land in which the Allerdene Burn flows adjacent to is only being obtained on a temporary basis, therefore, the flood regime needs to be maintained. Only the land adjacent to the A1 is being sought for the Applicant ownership and therefore the flood regime cannot be changed in the long term without having an impact on third parties. Detailed design will consider how the flood regime could be modified to facilitate more frequent flooding without having adverse impacts on third parties. |

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| | | | W12 - Current and up to date ecological survey work will be needed to inform any Environment Agency Flood Risk Activity Permit under the Environmental Permitting (England and Wales) Regulations 2016. This should be included as a requirement within the in the CEMP to ensure inclusion and to prevent any delays during permit applications.<br><br>As part of an application the Environment Agency will assess the submission in relation to Fisheries, Biodiversity and Geomorphology, we'll also assess its compliance with the Northumbria River Basin Management Plan (RBMP). The RBMP states that the water<br>environment should be protected and enhanced to prevent deterioration and promote the recovery of water bodies. It is advised that the development design a scheme which will help meet objectives and to promote the recovery of water bodies. | Agreed - this will be added to the updated Outline CEMP. The next iteration of the Outline CEMP (to be submitted at Deadline 4) will amend the version submitted at Deadline 2 [REP2-050 and 051]. |
| | | | **Otters**<br>Otters are not mentioned in the Outline CEMP but are included within the<br>mitigation required within the Biodiversity Chapter of the EIA. The CEMP must be<br>updated to reflect the mitigation and procedures in place to survey for and protect<br>otter as part of the scheme.<br><br>Night time works have been listed in specific areas where appropriate in reference G5. Any night time working on or near the River Team risks the possibility of European otter moving from the watercourse and attempting to re-enter the river by crossing live road networks. Due to the Local Importance given to otter as part of the EIA, specific mitigation for otter has not been listed. However, consideration should be given to prevent otter accessing the live road networks where the risk of traffic collision is high through the use of otter fencing from the River Team. | Otter mitigation is described in the Outline CEMP [REP2-050 and 051]. A summary is provided within the responses to written representations. Mitigation in respect of otter includes;<br>• Strategy to be implemented for the appropriate treatment of Invasive Non-Native Species [B18]; and<br>• Pre-construction check and cessation of works if otter are recorded [B24].<br><br>Other mitigation measures that will be beneficial to otter include:<br>• Monitoring of the freshwater environment for a range of variables that measure water quality [B9]<br>• A reduction in pollution road discharge and a reduced of rate of surface water runoff via the inclusion of oil interceptors, silt control, pollution control devices, and creation of attenuation ponds as detailed in the Outline CEMP [W4] [W5] [W7] [W1] [REP2-050 and 051].<br>• A temporary culvert is included within the River |

| WQ Ref | Question to: | Question: | Response from Environment Agency | Applicant's comments on the Response |
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| | | | | Team during construction works, which would prevent any movement of otter from the River Team to the road network at Coal House roundabout.<br><br>In relation to night time working, the inclusion of the temporary culvert within Coal House roundabout will prevent otter accessing the road network during nighttime works. |
| | | | **Water vole**<br>The Environment Agency has requested further information on the presence of water vole in relation to the scheme. Should any action be needed for the survey of or protection of this species, this must be detailed in the CEMP. | An assessment of water voles was included within paragraphs 8.7.61 to 8.7.66 Chapter 8 Biodiversity of the ES [APP-029], which concluded that this resource was not of more than Local value.<br><br>The areas surveyed were considered unsuitable to support water voles and thus further, more detailed, surveys for this species were not considered necessary to inform the biodiversity chapter of the ES [APP-029].<br><br>It is acknowledged, however, that water voles may move from year to year into areas in which they are not currently present. Thus, areas where water vole are not currently present, but which may be suitable for their use are considered to offer opportunities for enhancement for water vole.<br><br>In response to comments raised by the Environment Agency, measures that would be taken in the unlikely event of water voles being present during construction are included in the Outline CEMP [REP2-050 and 051]. A summary is provided within the responses to written representations. Mitigation includes:<br>• Strategy to be implemented for the appropriate treatment of Invasive Non-Native Species [B18]; and<br>• Pre-construction check and cessation of works if water vole are recorded [B24].<br><br>Other mitigation measures that will be beneficial to water vole include:<br>• Monitoring of the freshwater environment for a range of variables that measure water quality |

| WQ Ref | Question to: | Question: | Response from Environment Agency | Applicant's comments on the Response |
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| | | | | [B9]<br>A reduction in pollution road discharge and a reduced of rate of surface water runoff via the inclusion of oil interceptors, silt control, pollution control devices, and creation of attenuation ponds as detailed in the Outline CEMP [W4] [W5] [W7] [W1] [REP2-050 and 051]. |
| | | | **Culverts**<br>The River Team at the Coalhouse Roundabout will be subject to a temporary<br><br>culvert during works. No detail is provided in the CEMP or the EIA on the removal of the culvert and restoration of the river once the works are complete, and no habitat mitigation is shown on the Environmental Masterplan at the river in this location.<br><br>Reinstating the river post-construction needs to ensure that a natural watercourse is designed into the scheme and includes measures to improve on the existing relatively poor quality habitat available for fish and other species within this straightened and uniform section of the River Team. The CEMP will need to include the process and design considerations as per other landscape and mitigation requirements elsewhere in the document for the restoration of the river once works are complete. | The Outline CEMP [W21] [REP2-050 and 051] provides details that "The section of the River Team which is to be culverted as part of the temporary construction works will require bank rehabilitation as part of the culvert removal".<br><br>The River Team flows through the centre of this roundabout, within a largely man-made channel. In order to allow<br><br>safe access over the river for piling plant, piling works and pile-cap construction during the widening works associated with Kingsway Viaduct, a temporary box culvert is proposed to be used. The temporary culvert will limit the need for plant access the roundabout and will therefore minimise disruption to traffic during construction. The temporary culvert units and channel will be appropriately sized to manage the design flows to minimise the impacts on the natural flow characteristics of the watercourse. Following the completion of works, the temporary culvert would be removed, and the riverbed reinstated. |
| **1.10.1** | Applicant and Environment Agency | Paragraph 2.3.7 of the ES Flood Risk Assessment (FRA) [APP-163] acknowledges that the EA are currently revising the climate change allowances (as set out in the FRA) following the publication of new climate projections (UKCP18). The Applicant states that the Environment Agency in their document (Using 'Flood risk assessments: climate change allowances' following publication of new climate projections in UKCP18) (Ref 1.2) consider that the allowances detailed in Table 2-2 (for peak river flow) and Table 2-3 (for peak rail fall intensity) are still the best national | Paragraph 2.3.7 of the Environmental Statement Flood Risk Assessment (FRA) remains our current position and is still applicable. This approach has been hydraulically modelled by the Applicant and has informed how their development will be managed and mitigated for the life time of the development. | Noted. Please see Appendix 1.0 A, B and C for further correspondence on this matter. |

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| | | representation of how climate change is likely to affect flood risk.<br><br>Paragraph 2.3.8 states that this position and use of these climate change allowances has been agreed with the Environment Agency. Can the Applicant and the Environment Agency confirm that this remains to be the current position and provide any necessary update on this aspect of the assessment? | | |
| **1.10.2** | Applicant and Environment Agency | Paragraph 2.5.13 of the ES FRA [APP-163] states that the EA have informed the Applicant that the published Flood Map for Planning has been superseded by the River Team model, the results of which should be used in its place. But that this new mapping has yet to be published.<br><br>a) Has the new mapping now been published and, if not, when is it expected to be published?<br><br>b) If it has already been published, what implications does it have for the FRA? | The River Team modelling undertaken by Environment Agency has not been used to update our Flood Maps for Planning. It is envisaged that our Flood Maps for Planning will be updated within the next six months. | Noted. |

**Table 1.5 - Response from Gateshead Council**

| WQ Ref | Question to: | Question: | Response from Gateshead Council | Applicant's comments on the Response |
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| **1.01** | Gateshead Council | Chapter 5 of the Applicant's Planning Statement [APP-171] includes an assessment of the relevant local planning and transport policies.<br><br>a) Which documents constitute the Development Plan for each local authority area?<br>b) Do you agree with the list of relevant policies set out by the Applicant in this document? Are there any additional policies you consider to be relevant to the proposal? If so please provide them along with a justification for their relevance. | From a transport perspective the HE's inclusion of both the Core Strategy and Urban Core Area Action Plan and Making Spaces for Growing Places covers the transport aspects of the local plan.<br><br>At a local level the Council also has an adopted Cycling Strategy (adopted as SPG to the previous Unitary Development Plan) which establishes a cycle network for Gateshead. HE should be mindful of the strategy and cycle routes in the vicinity of their scheme.<br><br>At the national/regional level the one omission is the Strategic Transport Plan developed by Transport for the North. This recognises the importance of providing a consistent level of service and resilience for the A1. It also includes proposals to improve the capacity of the East Coast Main Line and HE should be mindful of the ongoing work in relation to Northern Powerhouse Rail. | An assessment of the Scheme against Policies of the Core Strategy, Urban Core Area Action Plan and Making Spaces for Growing Places is set out in Chapter 5 of the Planning Statement [REP2-048 and 049].<br><br>The Applicant undertook a review of "Gateshead Cycling Strategy" when preparing the Walking, Cycling and Horse riding (WCH) study (Appendix B of the Transport Assessment Report [APP-173]). The existing Walking, Cycling and Horse riding (WCH) facilities in the vicinity of the Scheme were audited, taking account of the Gateshead Cycling Strategy. As there are a number of residential and employment sites within the vicinity of the Scheme, these are likely to attract WCH trips which interact at the nearby junctions around the Scheme. The only cycling facilities within the vicinity of the Scheme are located on Durham Road, which is a major cycling link to Newcastle City Centre. There are currently three key sections of the Scheme that accommodate the movement of pedestrians or cyclists:<br>• A1 junction 67 – Coal House Roundabout; |

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| | | | | • Smithy Lane – approximately 0.5 miles south of the A1 junction 67; and<br>• A1 junction 66 – approximately 1.4 miles south of the A1 junction 67.<br><br>The likely impacts on WCHs that would occur as a result of the Scheme have been reviewed. In order to inform the preparation of the WCH study, the local "Gateshead Cycling Strategy" policy advice notes were considered. The Applicant considers that the Scheme aligns with the goals and objectives of the "Gateshead Cycling Strategy."<br><br>The Policy CP1 is related to 'Great North Cycleway' GCN1. Eighton Lodge Interchange forms part of the NCN Route 725 'Great North Cycleway'. The shared footway/cycleway provision at Eighton Lodge Interchange, which is designated as part of the NCN Route 725. There is potential for a cycling route from the Eighton Lodge Interchange running parallel to the A1 mainline to be implemented in the future as part of another scheme, which would be unlikely to affect the A1 Birtley to Coal House Scheme or be prevented by it. The Cycleway would still be functional without any detrimental impact to the proposed Scheme.<br>**Policy CP2 –** relates to the funding of projects – it is unaffected by the Scheme;<br>**Policy CP3** – relates to co-operation with Sustrans on improving the National Cycle Network – it is unaffected by the Scheme;<br>**Policy CP4 -** relates to implementation of improvements to improve safety for cyclists, which is achieved as part of the |

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| | | | | Scheme;<br>**Policy CP5 –** deals with scheme audits in design of highway schemes. For the Scheme the WCH assessment was undertaken;<br>**Policy CP6 –** deals with the standard of construction of cycle routes and is not in conflict with the Scheme;<br>**Policy CP7** deals with mapping of cycle routes and is unaffected by the Scheme;<br>**Policy CP8** – deals with communications and is unaffected by the Scheme;<br>**Policy CP9** - relates to training and awareness – it is not affected by the Scheme;<br>**Policy CP10** – addresses the promotion of cylciing as part of a healthy active lifestyle and is not affected by the Scheme;<br>**Policy CP11** – addresses cycle tourism and is supported by the Scheme to the extent that is improves provision for cyclists;<br>**Policy CP12** -encourages the Council to engage with cyclists and cycling groups and is unaffected by the Scheme;<br>**Policy CP13** - promotes cross-boundary liaison;<br>**Policy CP14** - relates to the encouragement of cycling;<br>**Policy CP15** ensures the Council will work with employers and developers to promote cycling in travel plans. As noted elsewhere, the Applicant will examine the use of travel plans for operatives during the construction phase;<br>**Policy CP16** – deals with engagement with Schools<br>**Policy CP17 -** deals with cycle parking and is not affected by the Scheme; and |

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| | | | | **Policy CP18** – deals with how new development should address cycling in planning. This is not relevant to the Scheme since it is not development that comprises a destination.<br><br>The Applicant concludes that all Policies from CP1 to CP18 were considered and the "Scheme" fully complies without hampering any aspirations.<br><br>The Strategic Transport Plan, adopted February 2019, outlines the case for transport investment across the north, in order to rebalance the UK economy. In particular, the plan notes that the North's transport system needs to be accessible resilient, safe, well-maintained and accommodating for the free-flowing movement of people for work, business and leisure. *"Better transport links make jobs more accessible, provide greater choice and can deliver better quality of life"* (page 50). The plan outlines a series of measures for improvement across the north and states *"To realise the benefits of agglomeration and economic mass, the North requires faster, more efficient, reliable and sustainable journeys on the rail and road network." (page 64). "Improvements to the Strategic Road Network within the North are a key priority for businesses, individuals and Local Authorities, especially for interventions to strengthen the performance and resilience of the M62, M1 and A1 (M)" (page 120).* A series of pan-Northern conditional outputs against which the performance of the Major Road Network will be monitored includes: journey reliability; network efficiency; network resilience; and |

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| | | | | journey quality. The proposed improvements to the A1 are considered to comply with the aspirations of this plan, as they will improve journey times and provide additional capacity to cope better with events and maintenance. As noted by Gateshead Council the plan also identifies significant aspirations for rail investment across the north and the Strategic Development Corridor of the East Coast to Scotland (Page 141). The Scheme will not put at risk the delivery of these rail improvements as it will renew the ageing asset being the existing Allerdene Bridge which crosses the East Coast mainline. In the immediate term, the effects are controlled by the Rules of the Route to minimise disruption. |
| | | c) Are there any relevant emerging policies? If so, what is their current stage in the plan adoption Process? | In relation to emerging policy, it is intended that in the near future the Transport Manifesto 2016-2036 will be superseded by the North East Joint Transport Committee's Transport Plan. HE should be mindful of the emerging objectives and principles of the plan, a draft of which is expected to be available later in 2020. | Noted – as the draft has not yet been issued it cannot currently be taken into account. |
| | | d) Please provide copies of all relevant adopted and emerging policies. | Gateshead Cycling Strategy (document)<br>https://www.gateshead.gov.uk/media/3854/Gateshead-Cycling-Strategy/pdf/cyclingstrategy.pdf?m=636443661863630000<br><br>Gateshead Cycling Strategy (plan)<br>https://www.gateshead.gov.uk/media/3858/Gateshead-Cycle-Network-Map/pdf/Gateshead-Cycle-Network-map.pdf?m=636443664001970000<br><br>Northern Powerhouse Rail<br>https://transportforthenorth.com/wp-content/uploads/Potential-of-NPR_TfN-web.pdf<br><br>Transport for the North Strategic Plan<br>https://transportforthenorth.com/reports/strategic-transport-plan-2019/<br><br>NE Joint Transport Committee Transport Plan (Item 6 on the Agenda) | Noted |

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| | | | https://northeastca.gov.uk/wp-content/uploads/2020/01/JTC-21.1.2020-Public-Agenda-Pack.pdf<br><br>It is not considered the above will have a major impact on the proposed improvements. However, they do provide further context on the need for the road, and reinforce comments about the importance of improving cycling connections. | |
| **1.0.2** | Gateshead Council | The outline Construction Environmental Management Plan (CEMP) [APP-174] including the Record of environmental actions and commitments (Table 3-1) and outline Construction Traffic Management Plan (CTMP) (Appendix B) includes measures to avoid, prevent, reduce or, where possible and appropriate, offset the potential environmental impacts associated with the construction of the Proposed Development.<br><br>Please comment on the acceptability of the outline CEMP | The status of the document as an outline CEMP, with the intention to develop a detailed one in due course (s1.1.4) is welcomed.<br><br>Appendix A shows the proposed location and layout of the site compounds to be used during the scheme. Details of the access arrangements for these, and related arrangements for wheel washing and road sweeping, should be agreed with Gateshead Council prior to their construction.<br><br>For other transport related matters see response to question 1.9.3 below. | The Applicant considers that the outline CEMP [REP2-050 and 051] is acceptable, and that it encompasses the mitigation measures identified in the assessment of significant effects reported in the Environmental Statement. It continues to be developed as the Examination proceeds and will next be submitted at Deadline 4.<br><br>The Outline CEMP and CTMP [REP2-050 and 051] are based on the preliminary design as submitted with the application, and will be refined, developed and expanded upon as detailed design progresses, construction methodologies are finalised and more information becomes available. The Outline CEMP will form the basis of the CEMP which will be produced by the main contractor prior to construction and approved by the Secretary of State in consultation with the local authority and the Environment Agency.<br><br>With regard to any potential amendments or additions that may be required the CEMP would be updated in response to the following:<br>• Changes in design<br>• Changes in external factors such as regulations and standards<br>• Any unforeseen circumstances as they arise such as new protected species or new archaeological finds |

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| | | including any potential amendments or additions that may, in your view, be required. Provide appropriate justification for any amendments or additions sought. | | • The results of inspections and audits<br>• Learning points from environmental near misses and incidents<br><br>As construction methodologies are developed, the Outline CEMP [REP2-050 and 051] would be updated to reflect these changes and the mitigation would be at least as good as that identified currently. The Outline CEMP (and the subsequent CEMP) is however a live document that would be updated as required and when new information becomes available. This is detailed in section 1.2 of the Outline CEMP.<br><br>Details of access arrangements, final arrangements for wheel washing and road sweeping would be included in the CEMP [REP2-050 and 051] which would be agreed with the Secretary of State following consultation with Gateshead Council. |
| **1.0.4** | Gateshead Council | Section 5.4 of the Planning Statement [APP-171] sets out the Applicants position regarding the Green Belt policy implications of the scheme.<br><br>The Council's comments are requested on the Applicant's Green Belt assessment. Where there are areas of | The Council believes that Sections 5.4 and 5.5, especially taken together, do not provide a sufficient justification in terms of all aspects of national Green belt policy.<br><br>These sections are extremely unclear as to the basis on which the scheme is acceptable in terms of national Green Belt Policy and give contradictory alternatives for the following:<br>(i) whether it would adversely affect the openness of the Green Belt (paras. 5.4.6 and 5.4.13);<br>(ii) whether it constitutes inappropriate development (para. 5.4.10), the reason given why it "may", as stated, not being in line with the NPPF; and<br>(iii) whether the impacts would be the same for all the options (paras. 5.4.26 and 5.5.4). It also repeatedly quotes "outweighed" instead of the correct "clearly outweighed" (NPPF para. 144).<br><br>The Council accepts that there are very special circumstances which clearly outweigh any harm provided that harm is minimised both during construction and by the road as constructed. The statement does not address selection of an option to minimise harm; this should be a pre-requisite.<br>The Statement does not indicate separate justifications for temporary buildings and structures (para. 5.4.7) in the light of Green Belt policy, or the minimisation of their impact. These are major omissions of issues that must be considered. | The Applicant provided additional Green Belt justification at Deadline 2 in response to the Examining Authority's Written Questions [REP2-060]; and an Addendum on Green Belt issues has also been produced. This addresses the queries that have been raised by (i), (ii) and (iii)<br>For avoidance of doubt, where the DCO documentation submitted to date referred to the benefits of the scheme outweighing the Green Belt impacts, the benefits are considered to clearly outweigh the impacts.<br><br>Gateshead Council has accepted the very special circumstances justification set out in section 5.4 of the Planning |

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| | | disagreement please explain why. | | Statement [REP2-048 and 049].<br><br>The Scheme would be constructed by an appointed contractor and it is not yet possible to predict the techniques and technologies to be adopted with absolute certainty. A reasonable worst case scenario has, therefore, been assumed. On this basis Paragraph 5.4.7 of the Planning Statement [REP2-048 and 049] makes the assumption that temporary buildings and structures commonly to be found on a construction site will be required even though this has not yet been confirmed.<br><br>During construction buildings and structures will only be constructed where absolutely necessary to minimise harm to the openness of the green belt. This is provided for in [*where?*] Should such temporary buildings or structures be required, can be subject to a separate Green Belt assessment to the permanent works. Green Belt Planning Practice Guidance from the Ministry of Housing, Communities and Local Government (published on 22 July 2019) sets out the factors that should be taken into account when considering the potential impact of developments on openness of the Green Belt. The duration of the development and its ability to be remediated - taking into account any provisions to return the land to its original state or to an equivalent (or improved) state of openness is an important consideration when determining the appropriateness of temporary buildings and structures in the Green Belt Given that the construction works are temporary, impacts will be mimimsed and all construction works will be remediated at |

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| | | | | the end of the construction period, no temporary works are considered to be inappropriate Green Belt developments. Furthermore, the impact is transient and caused by engineering operations, which will be finite in nature, thereby maintaining the long term purposes of the Green Belt.<br><br>Notwithstanding the above, any Green Belt harm during construction of the Scheme has been minimised by:<br>• Selecting offline Option 1a, as the preferred route which has reduced temporary works and complexities compared to the discounted options as Allerdene Bridge will be constructed to the south of its current location, so the demolition of the existing Allerdene Bridge is not on the critical path. This means that the duration of works (and hence temporary activities) in the Green Belt is minimised<br>• Controlling construction works through the Construction Environmental Management Plan (CEMP) [REP2-050 and 051] which describes the measures to be implemented in order to manage potential environmental impacts during construction, thereby minimising temporary impacts on the Green Belt; and<br>• Carrying out demobilsation and reinstatement works at the end of the construction programme to ensure that the land will be returned to its original state or to an equivalent (or improved state) once the works have been completed. |

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| **1.0.11** | Gateshead Council | Paragraph 3.2.1 of the outline CTMP [Appendix B of APP-174] states that standard working hours will be Monday to Friday from 7.00am to 19.00pm. However, paragraph 1.3.12 of the outline CEMP and Requirement 4 of the dDCO [AS-012] also refer to hours of work between 07.30 and 13.00 on Saturdays.<br><br>Does the Council agree with the proposed standard construction hours? If not, please provide reasons for any disagreement. | No issue with the hours proposed. | Noted |
| **1.0.15** | Gateshead Council | A long list and short list of proposed developments used to assess cumulative effects are presented in Appendices 15.1 [APP-167] and 15.2 [APP-168] of the ES.<br>a) Have these | a) Not that I am aware of. | The Applicant has previously responded to this question at Deadline 2, please see the Applicant's Written Question response Q1.0.15 [REP2-060]. The Applicant can confirm that the methodology for cumulative effects and "long list" of developments were provided to Gateshead Council (emails on 24 October 2018 and 18 December 2018) for comment and no response has been received to date. |

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| | | lists been agreed with the relevant local authorities? | | |
| | | b) Have any more relevant proposed developments been identified since the drafting of these documents? | b) Not that I am aware of at this time. | The Applicant has previously responded to this question, please see REP2-060. |
| **1.1.1** | Gateshead Council | The Applicant's air quality assessment is set out in Chapter 5 of the ES [APP-026].<br><br>Does the Council agree with the impacts scoped out of the assessment in paragraphs 5.4.8 and 5.4.9? | Having read Chapter 5, in conjunction with Appendix 5.1 and Appendix 5.2, I agree with the impacts being scoped out of the assessment. | It is noted that the Council agrees with the impacts scoped out of the assessment in paragraphs 5.4.8 and 5.4.9 of Chapter 5 Air Quality of the ES [APP-026]. |
| **1.1.2** | Gateshead Council | Included within Table 5-3 of the ES [APP-026] there is reference to the UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations. It states that Newcastle City Council and Gateshead Council have been directed to undertake | Gateshead, Newcastle and North Tyneside Councils were subject to a legal direction to submit a full business case to address nitrogen dioxide pollution which has been identified by government as exceeding the EU limit values. The Councils have now submitted a full business case for their clean air plan to the Government's Joint Air Quality Unit. The business case sets out proposals for a number of measures including:<br><br>- a category C (bus, coach, taxi, HGV, LGV) Clean Air Zone in central Newcastle;<br><br>- the reduction of the Tyne Bridge to one lane of general traffic in both directions along with a northbound bus lane and a safe working area/southbound bus lane (dependent upon award of maintenance funding for the bridge by DfT); and<br><br>- traffic management of the merge between New Bridge Street and the A167M.<br><br>In addition to this a package of mitigation measures has been submitted to government including grants/leases for businesses and people effected; funding for school streets; public transport priority and a freight consolidation centre. The local authorities are awaiting the response of government to their proposal. The | Gateshead Council's comments in relation air quality are noted. Their statement which maintains the A1 improvements are likely to support the clean air measures by ensuring a more attractive alternative route is available to vehicles than using the urban road network, confirms that the Scheme is compliant on this matter. |

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| | | feasibility studies in relation to measures to deliver compliance with EU limit values and that such work is ongoing.<br><br>The Councils are requested to provide an update on the progress of this work and explain what, if any, relevance it may have for the Examination of this application? | authorities have also submitted a bid to Highways England for an electric van centre of excellence (which would be match funded by the mitigation fund bid). If approved, the clean air plan will need to be delivered in the shortest possible time which would be 2021.<br>If implemented, the A1 improvements are likely to support the clean air measures by ensuring a more attractive alternative route is available to vehicles than using the urban road network. | |
| **1.2.2**<br><br>**1.2.2 Contd** | Gateshead Council | Paragraph 8.4.19 of the ES [APP-029] states that ongoing liaison is being undertaken with Gateshead Council's ecological representatives to discuss the finalised Landscape Mitigation Design in Figure 7.6 of the ES [APP-061] detailing the landscape design relating to biodiversity mitigation.<br><br>a) Both parties are requested to | To date any dialogue between the Council's ecologist and the HE appointed ecologist(s) has been limited to the provision of ecological information regarding the study area (e.g. designated sites and protected species data) and the scope of the ecological survey. Currently there has been no dialogue between the Council and HE regarding the proposed approach to ecological mitigation, compensation and enhancement. Such an opportunity would be welcomed as the Council has a number of concerns regarding the proposed mitigation strategy, particularly in relation to the provision of compensatory / replacement priority habitat creation, including woodland. | The concerns have been noted via the provision of the responses to Gateshead Council's written representations [REP2-061]. Further information has been provided to Gateshead Council regarding each of the points raised by them and the Applicant has requested comments. A request has been raised with Gateshead Council to provide comment on the further information. Further liaison is expected, however a date has yet to be arranged for this. The request from Gateshead Council for further information, sought further clarity on the following points:<br>• Habitat mitigation<br>• Ecosystem services<br>• Ecological connectivity and wildlife mortality associated with the use of acoustic fencing and concrete step barriers<br>• The relative benefits/disbenefits |

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| | | provide an update on the progress on this. In the view of the Council are there any outstanding matters needing to be resolved? | | of the two options (i.e. embankment and viaduct) for biodiversity<br>• Realignment of the Allerdene culvert<br>• Appropriate mitigation for the areas of Council land to be impacted by the Scheme<br>• Compensatory habitat creation and maintenance issues relating to Bowes Railway LWS and Longbank underpass<br>• Mitigation measures for otter during the construction and operation of the proposed scheme<br>• Predicted impacts and proposed mitigation relating to breeding and wintering waders<br>• Provision of species-specific mitigation/enhancement measures including bat and bird boxes<br><br>Further information on all of these points was supplied by the Applicant in their responses to Gateshead Council's written representations [REP2-061], this would form the basis for further discussion; and we continue to find an agreeable date for this to take place. |
| | | b) How does the Landscape Mitigation Design relate to Requirement 5 (Landscaping) of the dDCO [AS-012]? | The Council has an agreement (set out in the draft SoCG) to work with HE to produce a single coherent landscape scheme for the Angel of the North, which takes forward Option 3 as set out in the Southern Green options appraisal. Consequently, the landscape mitigation design at 6.2 figure 7.6 will be required to be amended. The HE scheme will require offsite compensatory measures including tree planting, which should be prioritised in Gateshead Borough close to, or within view of the A1or adversely impacted users & residents, and to enhance biodiversity and ecological value of other/a new site.<br><br>The Landscape Mitigation Design relates closely to Requirement 5, however the LMD is not complete at this stage because the assessment and mitigation of adverse landscape and visual impact of the gantries, overbridge and acoustic fencing is ongoing. | The Scheme has identified mitigation as outlined on Figure 7.6: Landscape Mitigation Design [APP-061] which is based on the existing landscape which is the appropriate way forward. The Applicant has agreed in Table 3.2 Issues relating to the Angel of the North in the Statement of Common Ground [REP2-052] to undertake further work "Workshop to be arranged to discuss landscape and historic environmental issues affecting the |

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| | | | | setting of the Angel of the North."<br><br>The Applicant has now received the Southern Green Options Appraisal Report from Gateshead Council, which the Applicant is willing to submit to the Examination, and will review and comment on its coherence with the proposals set out in Figure 7.6: Landscape Mitigation Design [APP-061], and in particular the desire to pursue Gateshead Council's proposed Option 3 which proposes the clearance of substantial areas of vegetation within and beyond the highway boundary. The Applicant has agreed to hold a workshop in March 2020, at which the design of the landscape and setting to the Angel of the North will be discussed and where possible agreement will be reached on the removal of existing vegetation and where appropriate the nature and extent of any replacement planting. This workshop will consider Gateshead Council's stated decision to take forward Option 3 as set out in the Southern Green Options Appraisal (that proposes the removal of the majority of the surrounding vegetation, including within Highways England land). However, the Applicant's position is that this should only be taken forward in so far as it does not give rise to a more significant effect as a result of the Scheme. This may mean it is not possible to realise all the Council's desired outcomes of Option 3 so as to avoid significant effects from arising.<br><br>Once the outcome of the workshop is agreed between Gateshead Council and the Applicant, it may be appropriate for the Applicant to consider supporting |

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| | | | | alternative enhancement or compensatory sites as identified by Gateshead Council within the context of the A1 for woodland and/or habitat improvements that are no longer appropriate in the context of the Angel of the North.<br><br>The landscape design as outlined in Figure 7.6: Landscape Mitigation Design [APP-061] is complete in that it outlines the approach to mitigation for the Scheme, including the adverse and landscape impacts of the North Dene Overbridge and noise barrier. To address the concerns of the Council, the Applicant has prepared several indicative cross sections to explain the relationship between the A1 corridor, noise barrier, gantries, and replacement planting in combination with existing planting that would be retained and the adjacent dwellings (see Appendix 1.2A). |
| **1.2.9** | Gateshead Council | The Applicant has submitted an Environmental Statement Addendum [AS-016] concerning the identification of two additional LWSs and the amendment of the boundaries of two Local Wildlife Site's within the scheme footprint and 2km buffer.<br><br>Gateshead Council and Natural England should ensure | Noted. | No comment |

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| | | that their Written Representation and/or Local Impact Report takes into account this additional information provided by the Applicant. | | |
| **1.4.1** | Gateshead Council | In reference to the dDCO, please identify any changes that you require, referring to Articles, Requirements and any other provisions as necessary. Provide your preferred drafting where possible and explain why it is proposed and what it aims to achieve. | Gateshead continues to liaise with Highway England and therefore wishes to reserve its position to respond to this question in due course. | Noted |
| **1.5.10** | Gateshead Council | Paragraph 6.9.5 of the ES [APP-027] states that the WSI would be submitted in consultation with the Tyne and Wear Archaeology Officer and would be approved by the Secretary of State in consultation with the local | The Tyne and Wear County Archaeology Officer's role is to provide advice on archaeological matters to the Council. They are retained as a consultant on this basis. They would be involved, and consulted on, the formulation/consenting of the WSI.<br><br>Draft requirement 4 requires compliance with the CEMP. Part CH2 of the draft CEMP requires the WSI to be agreed by the LPA. Draft requirement 9 (i) requires the LPA to be consulted on the draft WSI. At this stage the County Archaeologist would be consulted by the LPA, to advise the LPA on their response to the draft WSI. | The Applicant is aware of the role of Tyne and Wear County Archaeology Officer and they will be consulted on the formulation of the WSI in accordance with the DCO [REP2-044 and 045]. |

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| | | authority. There is no similar provision for consultation with the Tyne and Wear Archaeology Officer in either Requirements 4 and 9 of Schedule 2, Part 1 of the dDCO [AS-012] or in the REAC [APP-174].<br><br>a) Please clarify the role of the Tyne and Wear Archaeological Officer and how they would be involved in the formulation and/or consenting of the WSI. | | |
| | | b) Gateshead Council are also requested to seek and submit the comments of the Tyne and Wear Archaeological Officer on the Applicant's Cultural Heritage application submissions. | | |
| **1.5.11** | Gateshead Council | Concerns have been raised [RR-006 and RR-018] | | The number, placement, type, sign face design and structural form have been determined in accordance with the |

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| | | regarding the impact of the proposals (including from the road realignment and replacement Allerdene Bridge, gantries, signage and landscaping) on views of the Angel of the North from both the A1 itself and the railway line. Paragraph 6.8.24 of the ES [APP-027] states that views from the road towards the Angel of the North will be slightly more restricted due to the installation of gantries.<br><br>Do any further measures need to be secured in the DCO to satisfactorily preserve the views of and setting of the Angel of the North? | There is a clear concern that the position of the gantries will directly, and negatively affect views of the Angel as defined in the NECT 2018 study (submitted). The DCO does not currently specify the actual positions, nor provide enough visual information to identify the level of impact (despite this being requested). There is clear presumption against the obstruction of, or restriction of significant views of the Angel.<br>Discussion between the Council and HE consultants is ongoing regarding an additional photomontage from the A1 south of the Angel, and revising existing montages from the west, and also the creation of a verifiable drive-through model. The existing photomontage from VP 26 no longer accords with the Council's preferred option for the treatment of the Angel. A decision is required for the approach in this instance. | Applicant's guidance at the time. The main driver for the guidance in respect of gantry locations is the safe operation of the highway.<br><br>The Applicant has undertaken further assessment of the gantries, and this is described in "Applicant's Responses to ExA's First Written Questions at Appendix 1.5B Gantry Assessment Schedule" [REP2-020]. For the purpose of the assessment of the gantries, the locations identified on Figure 7.6: Landscape Mitigation Design [APP-061] have been used.<br><br>Further to this a Landscape Technical Paper has been prepared that provides a narrative on the views experienced by the users of the A1, and the East Coast Main Line (ECML). This describes the anticipated modifications on the views of the Angel of the North as a result of the presence of the gantries. This can be found in the Applicant's Deadline 2 Submission - Applicant's Responses to ExA's First Written Questions at Appendix 1.5 A Angel of the North Narrative [REP2-019].<br><br>As requested by Gateshead Council an additional photomontage from the A1 south of the Angel of the North has been prepared from a location on the North Dene Footbridge as discussed and agreed following the meeting on the 19 February 2020 and is appended to this response (see Appendix 5.2 of the response to the Local Impact Report submitted at Deadline 3).<br>Revised photomontages for those viewpoints with an appreciation of gantries has been undertaken and are provided in: |

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| | | | | • Deadline 2 Submission - Applicant's Responses to ExA's First Written Questions at Appendix 1.5 C Banesley Lane Woodland Photomontage [REP2-021]<br>• Deadline 2 Submission - Applicant's Responses to ExA's First Written Questions at Appendix 1.5 D Lamesley Road Photomontage [REP2-022]<br>• Deadline 2 Submission - Applicant's Responses to ExA's First Written Questions at Appendix 1.5 E Angel of the North Photomontage [REP2-023]<br>• Deadline 2 Submission - Applicant's Responses to ExA's First Written Questions at Appendix 1.5 F Chowdene Bank Photomontage [REP2-024]<br>• Deadline 2 Submission - Applicant's Responses to ExA's First Written Questions at Appendix 1.5 G Kibblesworth Photomontage [REP2-025]<br>The Applicant does not currently plan to prepare a verified drive through of the corridor in addition to that prepared for the public consultation exercise, as it is considered that the assessment of gantries, the Landscape Technical Paper and updates to the photomontages as identified above provide sufficient information to assess the Scheme, against the current Scheme design, including the |

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| | | | | restoration of the landscape adjacent to the Angel of the North.<br><br>The revised photomontage for Viewpoint 26 (Deadline 2 Submission - Applicant's Responses to ExA's First Written Questions at Appendix 1.5 E Angel of the North Photomontage [REP2-023]) remains current until such time as a revised strategy for the landscape surrounding the Angel of the North is discussed and where appropriate agreed with the Council.<br><br>The Applicant has, with the exception of the verified drive through provided the information requested by Gateshead Council as outlined above. The Applicant therefore currently considers that this provides sufficient information to the inform the examination of the DCO.<br><br>The information provided to date, on the current Scheme design and specifically around the Angel of the North demonstrates through written and graphic information outlined above, that for southbound views the effects are not anticipated to be significant. Effects on northbound views are anticipated to be modified by the presence of the gantries and to a lesser degree the design of the North Dene Footbridge, although it is identified that a combination of landform and existing vegetation, particularly around Eighton Lodge periodically obscures the Angel of the North in northbound views.<br><br>Currently the assessment of effects considers the Angel of the North in its current setting, and measures outlined in Figure 7.6: Landscape Mitigation Design [APP-061] aims to restore |
| | | | The DCO should seek to secure the above information prior to approval to allow discussion with the Council. Draft view analysis shows that the impact will be significantly harmful and more so on the north bound side than the south bound.<br>The immediate setting of the Angel will be changed considerably by the removal of all vegetation. See above regarding the agreement for a coherrent landscape scheme and mitigation for tree planting and biodiversity.<br><br>The draft DCO requirement 5 requires the landscaping scheme to be approved by the SOS following consultation with the LPA. The draft CEMP states that, at CH1 replanting at the Angel will be less dense to enable the Angel to be visible and at L14 that existing planting south of the Angel will be subject to woodland management to improve views/visibility of the Angel. | |

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| | | | The draft requirement 5 should specifically reference the design of a combined landscape across Council and Highways England land, in partnership with the Council, at the Angel. Draft CEMP part CH1 and L14 should be amended to reflect the agreed approach based on the SG report. Figure 7.6 in chapter 7 of the ES should be amended. | features of the landscape. Until such time as a revised design for the landscape associated with the Angel of the North is confirmed the Applicant's approach is to maintain existing screening where appropriate.<br><br>Until such time that discussions are held on the integration of the Gateshead and Highways England design and an agreement is reached, amendments to requirement 5 of the draft DCO [REP2-044 and 045] are not considered necessary.<br><br>To the extent that Gateshead Council wishes its own proposals to be integrated with the Applicant's Scheme, it is necessary for them to engage with the Applicant. The Applicant considers that measure CH1 in Table 3-1 REAC in the Outline CEMP [REP2-050 and 051] provides sufficient certainty and control to allow this to take place, since it states:<br><br>*"Landscape Mitigation Design approved by the SoS following consultation with the local authority."*<br><br>If Gateshead Council was able to identify potential sites which could provide compensatory woodland, the Applicant is willing to discuss potential off site compensatory woodland to offset that removed by the Scheme and that cannot be replaced due to the physical constraints of the corridor. |
| **1.8.5** | Gateshead Council (parts d and e only) | Table 12-17 of the ES [APP-033] provides details of the public rights of way | | |

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| | | (ProW) to be temporarily stopped up and the provision of substitute routes.... | | |
| | | d) Are any affected PRoW likely to be used by school children and, if so, what are the implications for journeys to and from school? | None of the affected PRoW are likely to be used by school children. | Noted – it is assumed that the reference relates to journeys to school. |
| | | e) Are additional safety measures required to be put in place for the ProW diversion across Junction 66? | These issues were covered in the previous Written Representation about PRoW diversion. | Noted. Please see Applicant's response to thisquestion in REP2-060. |
| **1.9.1** | Gateshead Council | The application is accompanied by a Transport Assessment Report (TAR) [APP-173].<br>Do the Council's agree with the content and findings of the TAR? Provide reasons for any disagreement with any aspect of it. | The Council agrees with the overall content and findings of the Transport Assessment Report, subject to the following:<br>• While the Transport Assessment includes an analysis of provision for walking, cycling and horse riding, it gives insufficient attention to the need to promote, as far as possible, more sustainable modes of transport. It is also unclear how far the recommendations for Highways England suggested in tables 17 to 22 have been followed through either in the detailed design of the scheme or by other means. This matter is commented on more fully in the response to questions 1.9.5, 1.9.10 and 1.9.11;<br>• Since preparation of the Transport Assessment there have been a number of changes to the wider context for the scheme, in particular:<br>• The proposed measures to improve air quality within central Gateshead and Newcastle have been agreed by the relevant local authorities. This matter is considered in more detail in the response to question 1.1.2;<br>Gateshead, along with other local authorities in the region have declared a climate emergency. This matter is considered in more detail in the response to question 1.9.11. | Noted. Please also refer to the Applicant's responses to this question and 1.1.2, 1.9.5, 10 and 11 [REP2-060]. With regards to Gateshead Council's recommendations for Highways England suggested in tables 17 to 22, it should be noted that the only improvements which will be delivered as part of the detailed design are those necessary to offset the impact of the proposed Scheme. These are identified in Transport Assessment Report [APP-173] Table 6-1 "Preliminary Design Stage Improvements for WCHs". For clarity, the improvements proposed and discussed above are to offset the impact of proposed Scheme.<br><br>The level of usage at the time of |

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| | | | | WCHAR study recorded were extremely modest and accordingly improvements to offset the impact of the proposed scheme were identified. This is shown in Section 2.8 of the WCHAR (Appendix D of the Transport Assessment Report [APP-173].<br><br>It should be noted that an alternative delivery path such as Designated Fund was identified on a precautionary basis in order to enable delivery even though evidence of future need was not available at the time of WCHAR study. Therefore, the other improvements identified in Table 17 to Table22 if deemed necessary were suggested to be undertaken as part of the Designated Fund Study for which additional review/study should be undertaken.<br><br>It is noted that Gateshead Council has declared a climate emergency, however, this is not a moratorium on the development of new roads or the improvement of existing roads. The Scheme is capable of being used by all vehicle technologies (including electric vehicles as well as those run on conventional fuel sources).<br><br>The Council in point 5.5.4 of their Local Impact Report states that "T*he declaration of a Climate Emergency inevitably raises questions over any proposals to increase road capacity. While such concerns are acknowledged it is considered they do not outweigh the need for this improvement*." Hence, the Council acknowledge that the Scheme is still justified notwithstanding the climate emergency. |

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| 1.9.3 | Gateshead Council | The outline CEMP [APP-174] includes an outline CTMP (Appendix B). Details of construction phase traffic diversions have been provided in Appendix 11.12 of the ES [APP-156].<br><br>Submissions from the Councils are requested with regard to the adequacy of content of the outline CTMP with particular regard to managing and mitigating the effects of construction traffic within the respective Council areas. | The preparation of the CTMP proposals, and commitment to develop a more detailed document as part of the CEMP, is welcomed. The current document does raise a number of issues where it would be useful to have further discussions with Highways England as part of the development of the detailed CEMP. Particular issues include:<br><br>Road closures<br>Any road closures will require a permit from April 2020 and be registered with the street works team at least 3 months before the start date of the closure, with the relevant requests for temporary traffic regulation orders also made three months before the start of the closure. A full diversion route would need to be agreed with the Council which may also (due to the location of the works) require agreement with the Highway Authorities of Sunderland City and County Durham.<br><br>Non-motorised (NMU) road users<br>Various routes proposed for construction traffic form part of the local cycle network or interact with Public Rights of Way. While an overall assessment of the project impacts on walking, cycling and horse riding has been undertaken, it is not clear the extent to which possible additional impacts from construction traffic have been assessed.<br><br>Arrivals/departures<br>Further information will be needed on the likely spread of arrivals and departures to the compounds, including deliveries, and how the risks of traffic queueing on the public highway will be minimised.<br><br>Construction worker trips<br>Given the location of the site compounds, close to well established bus services, it is disappointing that no effort seems to be being made to promote alternative to car access for construction workers.<br><br>Specific routes:<br><br>Lamesley Road<br>This road is rural in nature with narrow sections (5m) and limited visibility and therefore should not be used as a specified route to the construction sites. In addition, it has a bridge structure which has a weight limit. While not an issue for non-abnormal loads we would not wish to promote its use for construction traffic.<br><br>This road is part of the local cycle network and is affected by junctions with Public Rights of Way. Use of this road should be minimised as far as possible to reduce the impact on NMU modes.<br><br>Chowdene Bank<br>This has a 7.5 ton weight limit. It is also part of the local cycle network, so its use should be minimised as far as possible to reduce the impact on NMU modes. | In relation to the points raised, the Applicant would comment as follows:<br><br><u>Road closures</u><br>The Applicant is happy to discuss this further with Gateshead Council as part of the development of the detailed CEMP and CTMP.<br><br>NMUs<br>The Applicant considers that the assessment already undertaken and reported in the ES [ref] at [ref] is sufficient to understand the extent to which NMUs will interact with construction activities.The impact of construction traffic on NMU's has been considered further where there is a direct impact on a route. For example, at the Allerdene Working Compound measures to ensure the public footpath/cycle route remains open during the works and to ensure the safety of NMUs have been considered. Elsewhere on the local road network it is considered that the WCHAR is the appropriate method of assessment. The comments related to construction traffic also provided in Appendix G (Public Consultation Feedback) in the Transport Assessment Report [APP-173].<br><br><u>Arrivals/Departures</u><br>Deliveries to the Scheme will be programmed to arrive and depart on site within the working hours described in the outline CTMP and at levels that ensure a safe working environment |

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| | | | Durham road (A167)<br>This has a weak structure. While not an issue for non abnormal loads we would not wish to promote its use for construction traffic. It also takes vehicles toward the proposed Clean Air Zone and access restrictions in central Gateshead and Newcastle (see response to question 1.1.2.<br><br>The A167 forms part of the National Cycle Network (NCN 725) and the traffic plan should ensure that cyclists do not see a deterioration of conditions which may deter their use of this important route. Currently it has on average 223 cycles per day. Given the proposed construction works at the Eighton Lodge area, adequate mitigation measures need to be put in place – currently it is not clear either in this plan or the PROW diversions what these are.<br><br>Long Bank<br>Long bank becomes a residential road as it heads into Wrekenton and therefore the proposals should minimize the effect of any increase on traffic using this route. This road is affected by junctions with Public Rights of Way, some of which may be diverted directly onto Longbank as part of the works. Therefore, use of this road should be minimised for use as a route to and from the site to reduce the impact NMU modes. | within the scheme and on the local highway network. The Applicant has added a commitment to establishing a working group in the CTMP at Deadline 2 [REP2-050 and 051]. Further details about arrival and departure profile to the scheme can be discussed as part of the scope of this group and any concerns addressed through agreed measures.<br><br><u>Construction worker trips</u><br>The Applicant will add measures to encourage sustainable travel to and from the scheme by construction workers. This could include measures to promote local bus routes, the local cycle network, and car/van sharing. A section will be added to the CTMP as further details are discussed and agreed with Gateshead Council. The CTMP will be updated for submission at Deadline 4.<br><br><u>Specific Routes</u><br>The vast majority of HDV/HGV trips are assigned to the A1 northbound or southbound therefore are not affected by the restrictions raised by Gateshead Council. The following provides a brief overview of each of the local links in turn:<br><br>Lamesley Road - There will be HDV/HGV movements on Lamesley Road between the A1 (J67) and the compound entrance, a distance of approximately 150m. This section of Lamesley Road is approximately 7m wide and a suitable standard for HGV movements.<br><br>Chowdene Bank – The 7.5 tonne weight restriction is noted. No HDV/HGV trips are assigned to Chowdene Bank. The |

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| | | | | route will not be used by vehicles larger than 7.5 tonne as per the posted restriction.<br><br>A167 (Durham Road) – a limited number of HDV/HGV trips are shown using the A167 Durham Road over the duration of the programme and there will be an increase associated with the Allerdene Working Compound toward the end of the programme. Gateshead Council state the restrictions are not an issue for non-abnormal loads. The CTMP [Appendix B of REP2-050 and 051] includes a section on abnormal loads procedures.<br><br>In relation to the clean air zone it is likely most contractors/hauliers will look to avoid entering the clean air zone if possible due to the proposed charges and capacity restrictions on the Tyne Bridge. However, there are some facilities located in areas where routes may pass through the clean air zone.<br><br>Long Bank - There will be HDV/HGV movement on Long Bank between the A1 and the compound entrances, but beyond the entrance there are estimated to be 10 HDV/HGV AADT shown in the peak construction year. This will be related to the likely source of material/waste disposal. This could be material from Springwell Quarry, for example. This level of temporary increase in traffic movements is considered to be insignificant.<br><br>Further detail on routing can be included in the CTMP if required by Gateshead Council. At this stage the Applicant considers the proposed approach is acceptable and note |

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| | | | | Gateshead Council's commitment to working with the Applicant to identify a solution. |
| 1.9.5 | Gateshead Council | The representation from Gateshead Council [AS-007] draws attention to the what the Council considers to be the poor nature of facilities for pedestrians and cyclists at the Coal House roundabout (Junction 67).<br><br>a) What scope and justification is there for improvements to access and facilities for pedestrians and cyclists in this location through the Proposed Development? | Appendix D of the Transport Assessment Report (APP-173) provides a walking, cycling and horse riding assessment review. This highlights a number of deficiencies in provision along the length of the improvement, and includes a number of proposals to improve these. Proposals included in section 5 of the review to improve provision are in general supported, although it is not clear the extent to which these have been incorporated to date in the scheme design.<br><br>The assessment highlights the severance effect of the A1 on routes at both the Eighton Lodge and Coal House junctions. It proposes action at both these (Table 20 and Table 22 respectively), albeit via a Designated Funds study followed by a funding bid, rather than directly via the DCO. The proposal at both locations is for full signalisation, which would allow for the introduction of pedestrian phases to provide controlled crossing points, reducing the severance impacts at these locations.<br><br>It is not known whether either of these studies or bids has progressed. The Council would support the proposal at Eighton Lodge and can confirm it is developing proposals for complementary improvements to the cycleway along the A167 between Birtley and Low Fell.<br><br>At Coal House the Council has specific concerns that a wider approach is needed. Previous studies into signalisation at this location have concluded that this is unlikely to a be viable solution to the problems faced by pedestrians and cyclists. This relates to the large number of entry/exit arms at the roundabout, making an effective signalised solution difficult to achieve.<br><br>Appendix D (table 10) notes the current modest levels of usage of pedestrian and cycle facilities at this location. However, the Council consider this may, in part at least, be due to the very poor current provision deterring its use. In addition, these figures understate the current and potential future importance of the route, notably:<br><br>- It provides the only practical pedestrian route from residential properties on Banesley Lane and at Lamesley to shopping facilities at the south end of Team Valley. While<br>these may be small in number the absence of any alternative emphasises the importance of adequate provision;<br>- The link at Coal House provides a potentially good route for cyclists to Team Valley from the south. Many of the roads to the south of Coal House are Advisory Cycle Routes and connect to significant residential populations at Birtley, Kibblesworth and villages in north Durham;<br><br>- There is potential for this to become a more important travel corridor in future. The Gateshead/Newcastle Core Strategy includes a major housing site at Kibblesworth for some 240 new homes, and for which a planning application has been received. In the longer term the possibility of rail related development in the Lamesley Marshalling Yards area remains.<br><br>Given this, and the problems with signalisation at the junction, the Council believes current proposals are unlikely to provide an effective resolution to this problem. As a result a wider review of provision, and how it | The Applicant has responded to this question at Deadline 2 making it clear what is proposed as part of the Scheme (see [REP2-060]).<br><br>For clarity, the improvements proposed to offset the impact of proposed Scheme and which would be delivered as part of the design are identified in Transport Assessment Report [APP-173] Table 6-1 "Preliminary Design Stage Improvements for WCHs" . As part of WCHAR study (Appendix B of the Transport Assessment Report) impact of "Severance" has been reviewed and multi-modal surveys were undertaken to identify level of use by each mode and general conditions of the route were recorded. The level of usage was extremely modest and accordingly improvements to offset the impact of the proposed Scheme were identified which as part of the DCO would be delivered as part of scheme design.<br>As the evidence of future use was not available at the time of WCHAR study, the signalisation of Eighton Lodge and Coal House if deemed necessary were suggested to be undertaken as part of the Designated Fund Study for which additional review/study should be undertaken. Signalisation of both interchanges is therefore not justified. The WCHAR study concludes that the level of use is modest and low level of use does not justify provision of signals as part of the Scheme. However, the Applicant has a mutual objective to |

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| | | | might be improved, is needed at this location. | promote sustainable transport and recognises Gateshead Council's desire for further improvements to be made outside of the DCO application and a response to this effect is given below at 1.9.11 and 12. |
| | | b) How could such improvements be secured through the dDCO? | It is recognised the scale of this task means that it is unrealistic to seek to achieve this as part of the particular improvement being proposed within the DCO process. However the Council is seeking an appropriate commitment from Highways England to ensure collaborative work continues on this problem in parallel with the main scheme proposals. | The Applicant is committed to continued collaborative working. |
| 1.9.10 | Gateshead Council | The representation from Gateshead Council [AS-007] draws attention to the need to address what it considers to be the poor nature of facilities for pedestrians and cyclists at Coal House roundabout.<br><br>The parties are requested to liaise and address this issue within their Statement of Common Ground to be submitted at Deadline 2. The Council should provide details of any measures it considers to be necessary and justified through | The Council is keen to continue discussions around this matter in line with the response to question 1.9.5. | The Applicant attended a meeting on 19 February 2020 to discuss the status of the Statement of Common Ground. However, not all relevant Gateshead Council staff were available at the meeting. The Applicant has agreed with Gateshead Council to liaise further on this matter as part of the Statement of Common Ground discussions. |

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| | | the proposed scheme. | | |
| 1.9.11 | Gateshead Council | The representation from Gateshead Council [AS-007] draws attention to the need for a complimentary programme of measures to promote sustainable transport.<br><br>Please can the Council provide further details of<br>i) the form of measures it considers would be appropriate and | i) Form of measures<br>The priority for any measures should be on promoting alternative to the car for relatively short journeys in and around the A1 corridor. It is for these journeys that walking, cycling and public transport are most attractive as an alternative to the car and also where the risk of increasing car dependence as a result of road improvements is likely to be greatest.<br><br>The approach suggested would be a programme of behaviour change activity based on the Government's Local Sustainable Transport Fund (LSTF) approach. This initiative ran between 2011/12 and 2015/16 across a number of areas in England and sought to promote reduced car dependence through the introduction of packages of measures.<br>Research into the impact of this included an analysis of the effectiveness of measures to promote sustainable travel to strategic employment sites and business parks (https://www.gov.uk/government/publications/lstf-evaluation-strategic-employment-sites-and-business-parks). Given the nature of land uses adjacent to this section of the A1, with a number of major employment areas close to the road, it is suggested this would be a good template to use for any measures.<br>It is acknowledged that the commitment to any such programme cannot be open ended in terms of its timescales. A four year programme is suggested, starting before or during the construction phase and continuing beyond completion. This would help embed activity prior to completion and ensure this is reinforced in the early years post opening. | The promotion of measures for alternative mode choices is outside the scope of the Scheme.<br><br>The Applicant will continue to work with Gateshead Council and support their initiatives around sustainable transport. Subject to availability and meeting the criteria, there may be opportunities to make use of Designated Funds available within Highways England to help support walking, cycling and horse riding issues and the Applicant is happy to work with Gateshead Council to identify possible projects that may be able to benefit from this funding. However, the Designated Funding can only be used for capital expenditure and is not available to support operational initiatives or changing travel behaviour. There may also be other funding opportunities that Gateshead Council can explore such as through the Department for Transport Transforming Cities Fund. |
| | | ii) the justification for those in connection with the proposed scheme? | ii) Justification<br>The tendency of additional road capacity to stimulate additional demand is well established (see, for example, the review by WSP for the Department of Transport in 2018, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/762976/latest-evidence-on-induced-travel-demand-an-evidence-review.pdf). The summary to the WSP report notes that 'induced demand is likely to be higher for capacity improvements in urban areas or on highly congested routes,' circumstances which apply to the A1.<br><br>Induced demand of this kind will undermine the benefits of increased capacity and have a detrimental impact on other objectives by:<br>- reducing the level of congestion relief;<br>- increasing emissions of greenhouse gases and other pollutants.<br><br>Given the likelihood of induced traffic occurring it is important the scheme includes measures to try and prevent | The promotion of measures for alternative mode choices is outside the scope of the Scheme.<br><br>The matters stated in relation to induced traffic are not matters that fall to this Scheme to address.<br><br>The Applicant will continue to work with Gateshead Council and support their initiatives around sustainable transport. Subject to availability and meeting the criteria, there may be opportunities to make use of |

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| | | | this as far as possible. The provision of a complementary programme of smarter choices measures to promote sustainable transport is seen as a flexible and practical means of seeking minimise induced traffic.<br><br>The declaration of a Climate Emergency reinforces the need for activity of this kind. Induced traffic risks seeing capacity improvements lead to increase in greenhouse gas emissions and measures of this kind would help minimise that risk. | Designated Funds available within Highways England to help support walking, cycling and horse riding issues and the Applicant is happy to work with Gateshead Council to identify possible projects that may be able to benefit from this funding. However, the Designated Funding can only be used for capital expenditure and is not available to support operational initiatives or changing travel behaviour. There may also be other funding opportunities that Gateshead Council can explore such as through the Department for Transport Transforming Cities Fund. |

# Appendix 1.0A - Further Responses on Written Representations

| 1.6 | Gateshead Council | Applicant's Response |
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| Property and Asset Management | | |
| 1 | The documents confirm that the Council will be affected by the proposals as landowner and occupier. The proposals intend to acquire Council land either by way of a of a temporary use, a permanent acquisition of the land and also acquisition of rights over the land. | It is correct that powers of compulsory acquisition of land or rights over land and temporary use of land are sought.<br><br>The descriptions of land are set our int eh book of reference, but are largely of the types described by the Council |
| 2 | The main areas of land that are affected by the proposals appear to be woodland areas within Council ownership and land that appears to be highway verge. In addition, they are seeking temporary use over private access routes within Council ownership and public footpaths and public bridleway. | This is correct. |
| 3 | Under the proposals the Council will be entitled to compensation for the various parcels of land that the Order is seeking to acquire. DLA Piper have already approached the Council in this regard seeking to negotiate settlement. | Gateshead Council is correct in that they are entitled to compensation in the same manner as any other landowner i.e. with reference to the Compensation Code. If it is appropriate then they will receive compensation for land taken permanently and temporarily, compensation for injurious affection and they will be compensated for any other reasonable costs incurred as a direct result of the acquisition (disturbance). DLA Piper has indeed sought to engage with the Council, but a substantive discussion is yet to take place. |
| 4 | Notwithstanding the above, based on the negative impact the scheme would have on Council land in respect of ecology/biodiversity, the Council is concerned about the extent of Council land/rights to be acquired by the scheme. The Council will seek assurance that appropriate ecology/biodiversity mitigation is provided as part of any compensation settlement. | It is not accepted that following the completion of the Scheme there would be a negative impact on the Council's land. Further, mitigation for impacts on ecology/biodiversity are not matters for compensation, even to the extent that it is appropriate to discuss this in any Examination at all. Section 87(3)(c) of the Planning Act 2008 allows the Examining Authority disregard representations "that relate to compensation for compulsory acquisition of land or of an interest in or right over land".<br><br>Nevertheless, the proposed ecology/biodiversity mitigation has been identified following the environmental impact assessment carried out for this Scheme and is considered appropriate in order to mitigate potential impacts. |
| Diversion of Public Rights of Way | | |
| 5 | This representation is based on information contained in Document 2.4 – Streets, Rights of Way and | The Applicant can confirm that the proposals for |

| 1.6 | Gateshead Council | Applicant's Response |
|---|---|---|
| | Access Plan. Its area of concern is in the proposals for the temporary diversion of Rights of Way during the construction of the project.<br><br>When making a diversion whether that is temporary or permanent the following should be considered:<br>• Physical features. The physical features of the new route should be similar to the original route, including:<br>  • surface;<br>  • gradient; and<br>  • path width.<br>• Directness. The new route should not unreasonably lengthen the path.<br>• Landscape character. The new route should not result in lower quality or diversity of views for the path user.<br>• Features of interest. The new route should not move the path away from significant features of interest.<br>• Financial. The new route should not result in any increased maintenance costs.<br>• Safety. The new route should not subject users to any potential dangers or hazards.<br>• Needs of all users. The new route should include features to improve access for the mobility impaired user; (for example, gates rather than stiles and ramps, rather than steps).<br><br>Highways England should confirm that the proposals for temporary diversion meet, as far as is reasonably possible, the above criteria. | temporary diversions meet the criteria listed within this representation as far as is reasonably possible. |
| 6 | The Council has the following specific concerns concerning the proposed temporary diversions of Public Rights of Way: | |
| 7 | Document 2.4 – sheet 3 (TR010031/APP/2.4(D))<br><br>This shows the temporary stopping up of two rights of way where they cross the temporary means of access (between points 3/10 and 3/11, and points 3/12 and 3/14). The plan indicates that controlled crossings will be put in place to allow continued use of the right across this during the construction phase. Confirmation is sought from Highways England that this will be the case, and that any interruptions to use of these paths will be minimised. | APP-008 Document 2.4 – sheet 3 (TR010031/APP/2.4(D)<br><br>With reference to the temporary stopping up of the public right of way between 3/10 and 3/11, the Applicant can confirm that this will be a temporary measure required towards the end of the construction programme to facilitate the demolition of the existing Allerdene Railway Bridge. The access track will only be required intermittently to get plant in and out of the site. When plant is crossing the public right of way, the crossing will be manned by the contractor. At all other times, the access track will be fenced off at both sides of the crossing to allow this right of way to operate as it does now. |

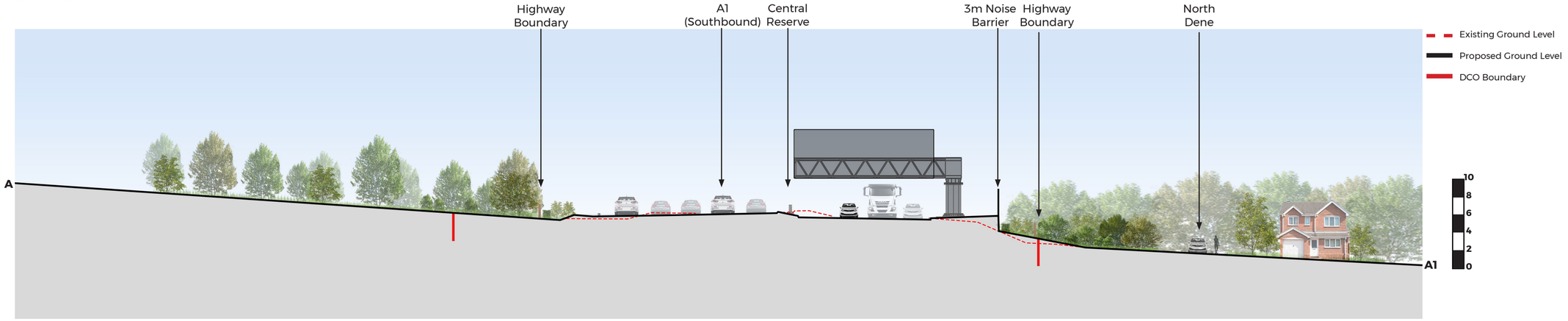
| 1.6 | Gateshead Council | Applicant's Response |
|---|---|---|
| | | With reference to the temporary stopping up of the public right of way between 3/12 and 3/14, as with the stopping up detailed above, this will also be a required on a temporary basis onwards the end of the construction programme to facilitate the demolition of the existing Allerdene Railway Bridge. The access track will only be required intermittently to get plant in and out of the site. When plant is crossing the public right of way, the crossing will be manned by the contractor. The public right of way at this location is an unsurfaced grass verge adjacent to the carriageway. When the closure is in place, pedestrians will be diverted to the paved footway on the north side of Woodford. |
| 8 | Document 2.4 – sheets 5 and 6 (TR010031/APP/2.4(F/G)<br><br>North Dene Footbridge<br><br>The footbridge from footpath BI/16 is being stopped up. On the plan there is a diversion from the north side but it does not reconnect with the south side. The length of the diversion is approximately 1,650 metres when the distance across the bridge is 60 metres. | APP-008 Document 2.4 – sheets 5 and 6 (TR010031/APP/2.4(F/G))<br><br>The footpath across the footbridge will be stopped up while the existing footbridge is removed, and the new footbridge is constructed. The current outline construction programme assumes that the closure will be in place for 24 weeks. The diversion shown to the north side connects to Long Bank Bridleway which will be the alternative crossing point of the A1 during the reconstruction of the footbridge. The existing footpath to the south of the A1 from Long Bank Bridleway to North Dene footbridge will complete the diversion. This section of the diversion route has been incorrectly omitted from the drawings. The drawing will be updated to show the full diversion This is the shortest possible diversion available. |
| 9 | Bridleway LA/72 (Bowes Railway Path)<br><br>This Bridleway is being diverted. The diversion route is over 1100 metres in length and is not user friendly as a bridleway, as a section of the diversion is on road. It also requires crossing the slip roads to and from the A1. These see high volumes of traffic some of which (particularly in relation to the on-slip) is travelling at relatively high speed. This will pose significant problems for pedestrians, cyclists and in particular horse riders seeking to use the diverted route. Closures and diversions affecting the Bowes Railway Path can be met with hostility from users, so any diversions should take on board the different users' needs and be properly communicated to all parties.<br><br>Both the diversions as currently proposed do not meet the principles outlined above. Further | The bridleway under the Long Bank Underpass will be diverted for a period of 13 weeks to allow the extension of the underpass to be constructed to facilitate the widening to the A1. The route proposed is the shortest possible route available during the closure of the underpass.<br><br>The current programme ensures that the underpass and North dene Footbridge are not closed at the same time. |

| 1.6 | Gateshead Council | Applicant's Response |
|---|---|---|
| | discussion is needed with Highways England over the possibility of improved provision, and to ensure that any time the use of Rights of Way is interrupted is minimised.<br><br>Should the closure of North Dene footbridge be required for any length of time, consideration should be given to provision of a temporary bridge crossing at this location. | The Applicant is happy to have further discussions with Gateshead Council to discuss suggestions/concerns they have regarding the proposed diversion routes. |
| Structures – Long Bank Bridge | | |
| 10 | (A) Long Bank Bridge provides the underpass by which the Bowes railway path passes beneath the A1 (see attached plan). The ponding effect of the northern slope of the embankment at this point, which sees the underpass effectively act as a drain, has been raised previously with Highways England. | (A) Gateshead Council raised historic issues relating to this flood damage and erosion issues. The potential cause of the flooding may be due to the change in direction towards the ploughing of the fields. The Council agreed to check further information as to the authenticity of this claim. However, no further information was received (Drainage Meeting Minutes 15/03/18). It is recommended that the Council investigate the matter with the respective landowners and propose other drainage solutions within third party land that will protect this location from erosion damage. Refer to Flood Risk Assessment at Appendix 13.1 of the ES [APP-163] paragraph 4.4.14. |
| 11 | (B) The original deck of Long Bank Bridge was beyond economic repair and a corrugated steel buried structure (CSBS) was placed inside the bridge span in 2006. The CSBS was extended at each end onto land owned by Gateshead Council. | (B) The current design for Longbank Underpass considers extension of the eastern end of the structure.<br><br>The extension shall comprise a similar CSBS type construction to a maximum length of 17m (refer to REP2-040). The proposed foundations of the underpass extension shall necessitate removal of the existing stone walls which run along the edge of the bridleway. The extended structure shall tie into the existing stone walls to minimise the potential for scour to occur at the interface. |
| 12 | (C) Subsequent to this an extreme weather event in September 2012 occurred which resulted in surface water from the uphill catchment being obstructed by the embankment of the A1 at this location and channelled into the Bowes Railway cutting. This caused extensive damage to the fabric of the Bowes Railway and the embankment that supports the A1 (see attached picture). | (C) The proposed A1 carriageway drainage shall intercept surface water at the top of the embankment thus reducing the potential for slope instability within the embankment. Consideration shall also be given to the slope stability and drainage of the widened section of embankment supporting the A1 carriageway (beyond the underpass), including the potential for slope instability during extreme weather events. |

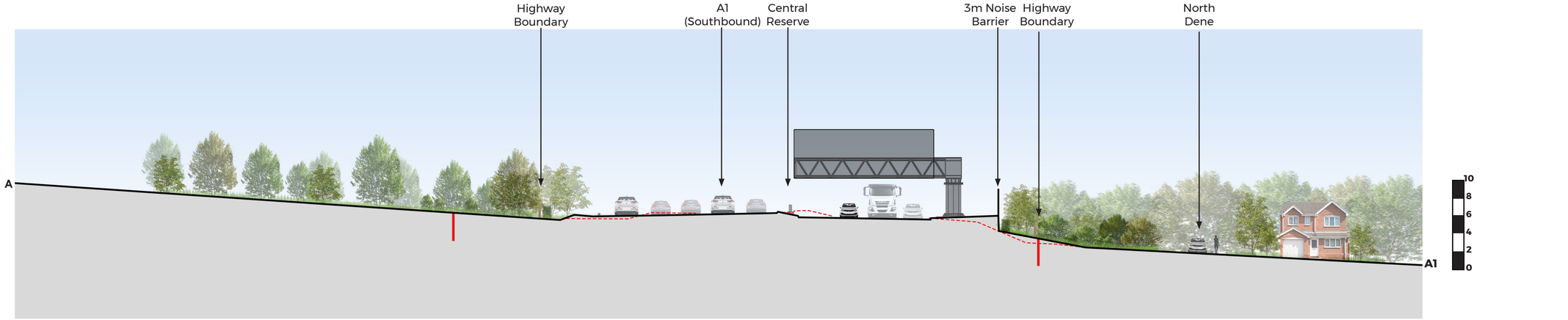
| 1.6 | Gateshead Council | Applicant's Response |
|---|---|---|
| 13 | (D) Action to repair the damage to the embankment at this time highlighted uncertainty over the responsibilities for this, and whether it lay with the landowner or Highways England. | (D) Highways England will undertake discussion with Gateshead to determine future responsibilities and liabilities. |
| 14 | (E) The DCO process, and proposed widening at this point, provides the opportunity to clarify responsibilities on this matter. As the embankment supports the A1 at this point it is the Council's view that future maintenance responsibilities and liabilities should lie with Highways England, and confirmation of this is sought. Also, any design should incorporate features that offer scour protection at the headwall and within the underpass. | (E) The source of the surface water causing the flooding issues is outside the highway boundary. As the cause is likely to be from the fields near to Longbank Bridleway, this cannot be connected to the road drainage system. It is therefore not proposed to provide any drainage provision to the Longbank Bridleway.<br><br>Assessments have confirmed that the Scheme itself will not exacerbate the issues raised from previous flooding history (see Flood Risk Assessment at Appendix 13.1 of the ES [APP-163]. As there are no existing connections, in compliance with the highway standards it is not intended to provide any drainage from areas outside the highway boundary.<br><br>There are no proposals to resurface the footpath along Underpass. This is to prevent major disturbance of the existing scheduled monument (track bed) located below the bridleway. |
| 15 | (F) The wider issue of the ponding effect of the embankment, and the damage this can cause to the Bowes Railway Path as a whole, will be considered in the Local Impact Report. | (F) This has been responded to as part of the Local Impact Report. |

# Appendix 1.2A - Cross Sections

## Chainage 13625 - Section - Year 1




## Chainage 13625 - Section - Year 15





| Rev. | Date | Description | By | Eng' Chk | Disc' Chk | App'd |
|---|---|---|---|---|---|---|
| P01 | Mar 20 | First Issue | HA | AW | NJA | KS |

Suitability

Status

PINS Reference Number: TR010031

Client: highways england

Project Title: **A1 Birtley to Coal House Scheme**

Drawing Title: Appendix 1.2 B
Sheet 1 of 3
Indicative Cross Section

| Scale | Drawn | Eng. Check | Approved | Authorised |
|---|---|---|---|---|
| NTS | HA | AW | NJA | KS |
| Original Size | Date: Mar 20 | Date: Mar 20 | Date: Mar 20 | Date |

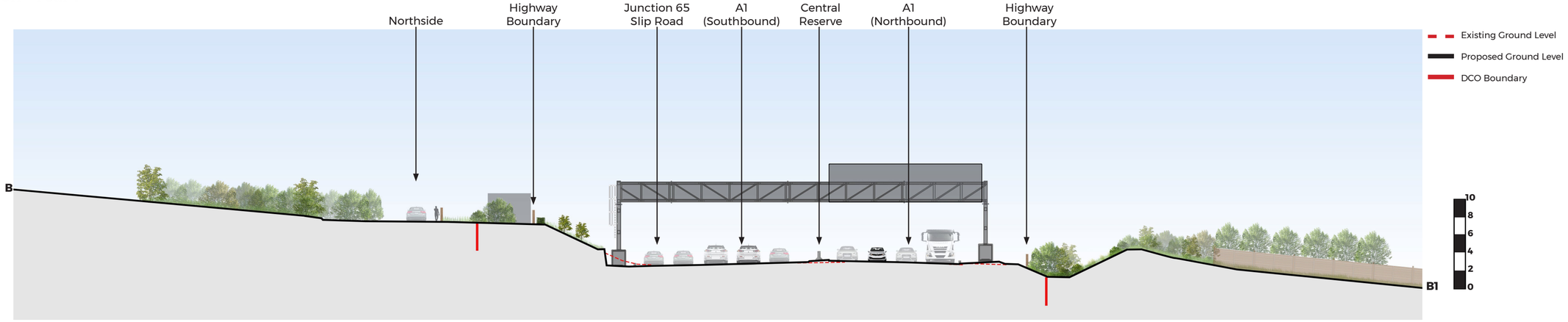
Drawing Number: HE551462 | Originator: WSP | Volume: 6.2 | Revision: P01

ZZ | | | DR | LE | 005 | PW Stage Code: Stage 4
Section | Type | ID | Direction | Type | Role | Number

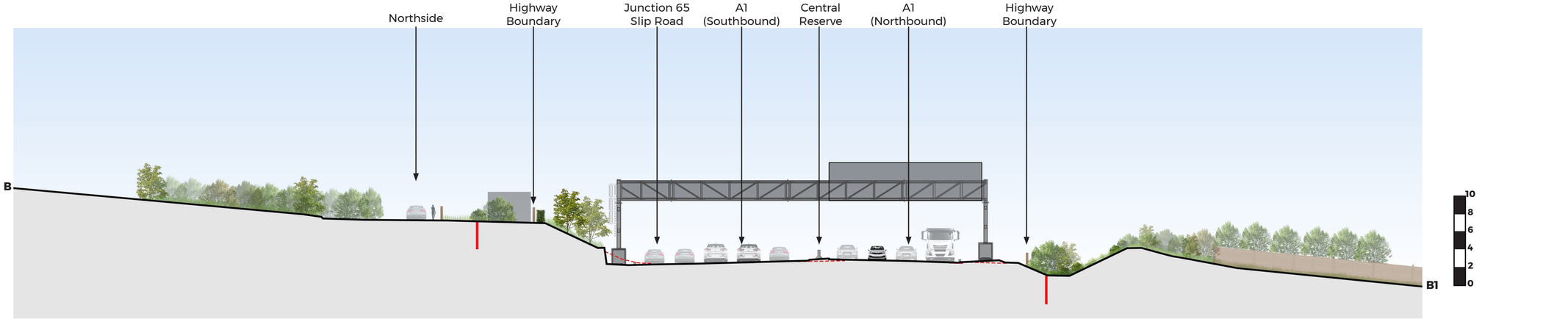
Security Class

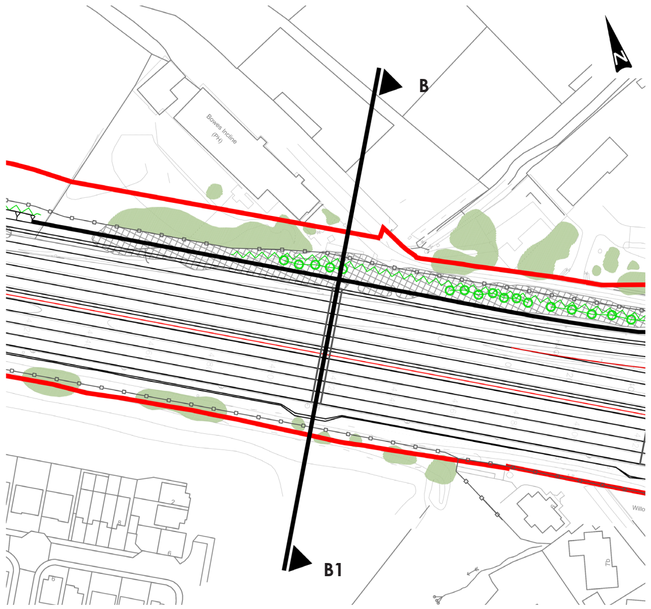
WSP Project Number: 70041947

## Chainage 14215 - Section - Year 1




## Chainage 14215 - Section - Year 15




| Rev. | Date | Description | By | Eng' Ch'k | Disc' Ch'k | App'd |
|---|---|---|---|---|---|---|
| P01 | Mar 20 | First Issue | HA | AW | NJA | KS |

Suitability

Status

PINS Reference Number: TR010031

Client: highways england

Project Title: **A1 Birtley to Coal House Scheme**

Drawing Title: Appendix 1.2 B
Sheet 2 of 3
Indicative Cross Section

| Scale | Drawn | Eng. Check | Approved | Authorised |
|---|---|---|---|---|
| NTS | HA | AW | NJA | KS |
| Original Size | Date: Mar 20 | Date: Mar 20 | Date: Mar 20 | Date |

Drawing Number
HE PIN: HE551462 | Originator: WSP | Volume: 6.2
ZZ | DR | LE | 005
Section | Type | ID | Direction | Type | Role | Number

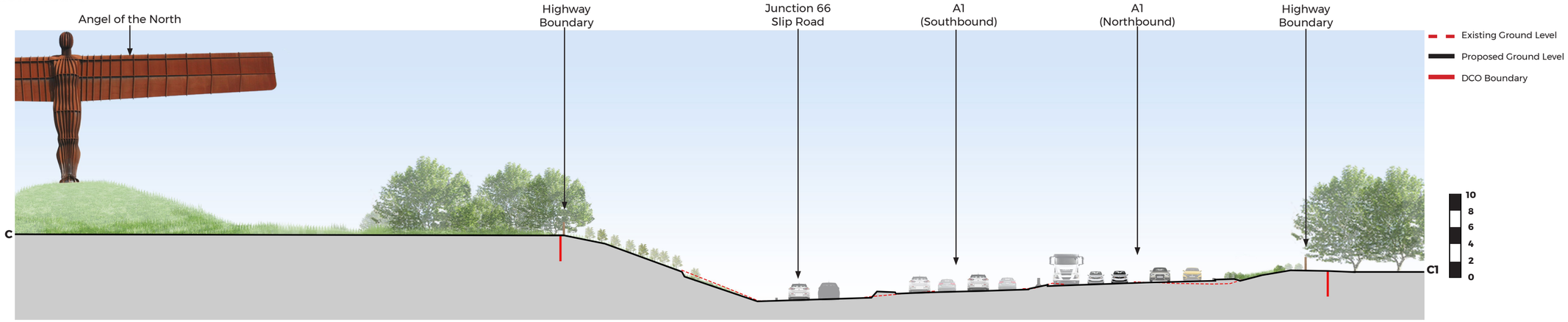
Revision: P01

PW Stage Code: Stage 4

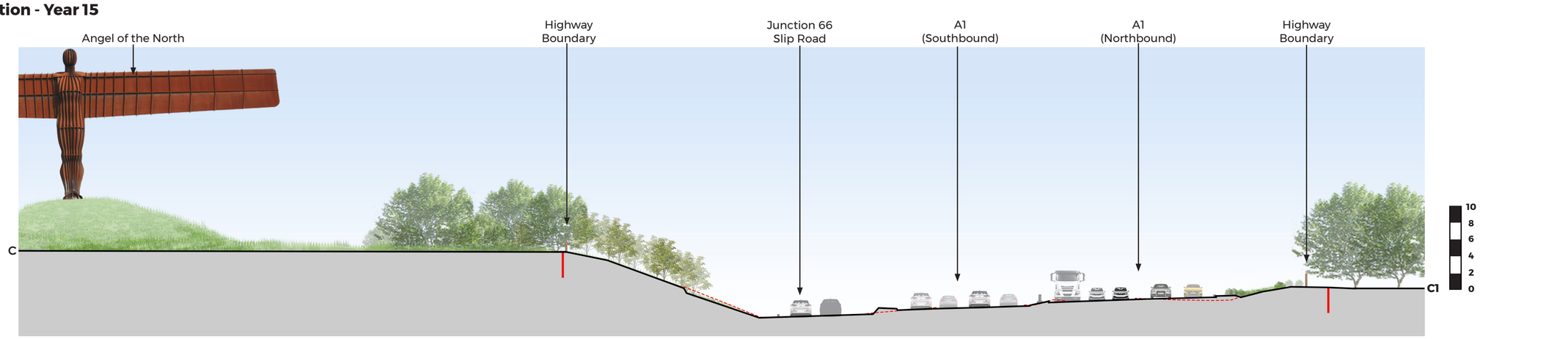
Security Class

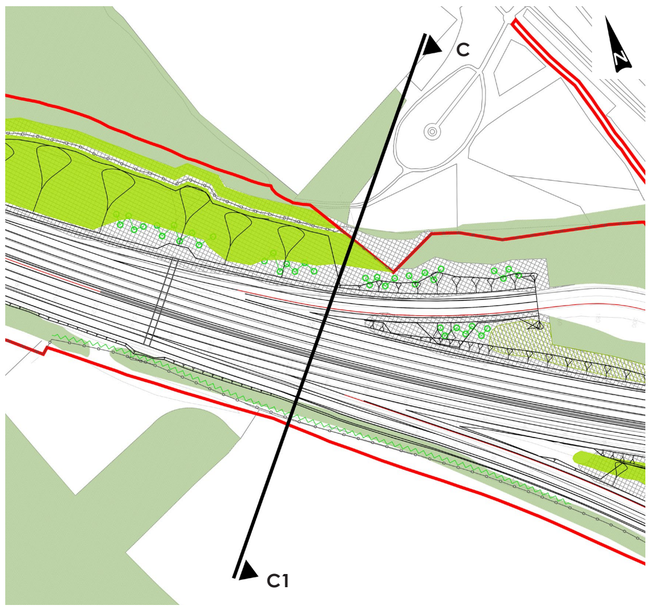
WSP Project Number: 70041947

## Chainage 12530 - Section - Year 1




## Chainage 12530 - Section - Year 15




| Rev. | Date | Description | By | Eng' Ch'k | Discr Ch'k | App'd |
|---|---|---|---|---|---|---|
| P01 | Mar 20 | First Issue | HA | AW | NJA | KS |

Suitability

Status

PINS Reference Number: TR010031

Client: highways england

Project Title: **A1 Birtley to Coal House Scheme**

Drawing Title: Appendix 1.2 B
Sheet 3 of 3
Indicative Cross Section

| Scale | Drawn | Eng. Check | Approved | Authorised |
|---|---|---|---|---|
| NTS | HA | AW | NJA | KS |
| Original Size | Date: Mar 20 | Date: Mar 20 | Date: Mar 20 | Date |

Drawing Number
HE PIN: HE551462
Originator: WSP
Volume: 6.2
ZZ | Section | Type | ID | Direction | DR Type | LE Role | 005 Number

Revision: P01

PW Stage Code: Stage 4

Security Class

WSP Project Number: 70041947

# Appendix 1.5A - EA Meeting Minutes 19/04/10

# AGENDA & MEETING NOTES

| | | | |
|---|---|---|---|
| **PROJECT NUMBER** | 70041947 | **MEETING DATE** | 10 April 2019 |
| **PROJECT NAME** | A1 Birtley to Coalhouse upgrade | **VENUE** | Environment Agency, Tyneside House, Skinnerburn Road, Newcastle upon Tyne, NE4 7AR |
| **CLIENT** | Highways England | **RECORDED BY** | [redacted] |
| **MEETING SUBJECT** | Environment Agency Comments on the A1 BCH Road Drainage and the Water Environment | | |

| | |
|---|---|
| **PRESENT** | [redacted] - Planning Technical Specialist<br>[redacted] - Flood and Coastal Erosion Risk Management Advisor<br>[redacted] – Catchment Coordinator for the Tyne Catchment<br>[redacted] – WSP Environmental Assessment Lead<br>[redacted] – WSP Water Specialist |
| **APOLOGIES** | [redacted], Gateshead Council |
| **DISTRIBUTION** | As above plus: [redacted] - Highways England PM, [redacted] - WSP PM |
| **CONFIDENTIALITY** | **Restricted** |

| ITEM | SUBJECT | ACTION | DUE |
|---|---|---|---|
| 1. | [redacted] presented an overview of the Scheme and provided a progress update on the stage of the environmental assessments and DCO submission.<br>In particular it was explained that the only changes north of the northern tie-ins at junction 67 (approximately level with the end of the existing noise barrier at Lady Park) are changes to signage.<br>The current submission of the DCO to the inspectorate is mid-June. | | |
| 2. | <u>Kingsway Viaduct Piers</u><br>The Environment Agency (EA) outlined that they had concerns over the need to extend the piers in the flood plain.<br>[redacted] detailed that modelling was undertaken using the EA / ICM model. The piers have been included in the modelling (there are 5).<br>[redacted] showed the results of the modelling that has been undertaken. This showed that none of the piers are in the baseline flood | | |

| ITEM | SUBJECT | ACTION | DUE |
|---|---|---|---|
| | extents, they only fall in the flood extents when looking at the climate change allowances are taken into account (+25% and +50%).<br>[redacted] showed the results of the modelling that has been undertaken. This showed that none of the piers are in the baseline flood extents, they only fall in the flood extents when looking at the climate change allowances are taken into account (+25% and +50%).<br>[redacted] detailed that the photographs showing the piers in relation to the river. | | |
| **3.** | <u>Modelling:</u><br>EA ([redacted]) highlighted that they would like to see the modelling so that they can check that it is correct. They could then make their comments prior to DCO submittal. Once at detailed design the Flood Risk Permit would be straightforward.<br><br>[redacted] to provide confirmation that the models were provided to the EA as part of the package of information.<br><br>[redacted] stated that the EA flood modelling team may not get their response back prior to the DCO being submitted, as a detailed model review would normally take 2 weeks to complete and that availability of resource to carry this out may not be immediately available. [redacted] outlined that the [redacted] may need to be increased – up to £2000 + VAT for review of the model. [redacted] will send through costs.<br><br>[redacted] discussed that we would confirm or send the model today. | [redacted] | 11/04/19<br>Completed (model already provided) |
| **4.** | <u>ES Chapter:</u><br><br>[redacted] detailed that no comments had been provided on the ES chapter. EA ([redacted]) confirmed that they are happy with the content of the ES chapter. | | |
| **5.** | <u>EA Comments:</u><br><br>Inception / exception text – provide more information on this process and how have they been carried out? AS to provide additional information into the FRA.<br><br>[redacted] to send word version of the EA comments. | [redacted] | Completed 12/04/19 |
| **6.** | <u>Modelling and Climate Change Guidance:</u> | | |

| ITEM | SUBJECT | ACTION | DUE |
|---|---|---|---|
| | [redacted] discussed that climate change guidance (UK CP09) had been adopted for the modelling which was completed in December 2018. After the modelling had been completed the EA released an interim position on climate change in light of UK CP18. Due to the timing of this, the UK CP18 had therefore not been used.<br><br>[redacted] detailed that the EA is currently reviewing and assessing UK CP18.<br>[redacted] outlined that in the case of something of importance like this – the interim position would be to use UK CP18 (not UK CP09).<br><br>[redacted] discussed that given that we are not in the flood plain it's likely there would not be any difference.<br><br>EA ([redacted]) asked if we could run the worst case scenario (8.5 scenario standard method) and that Highways England projects of this scale this should be followed. [redacted] also noted that there could only be a minimal difference. | | |
| **7.** | <u>Flood Maps in the ES:</u><br><br>[redacted] detailed that the flood map for planning as currently published does not include the findings of the EA's version of the ICM model – this is currently being updated. The maps that should be used should therefore not be the flood map for planning but use the outputs from the baseline ICM model.<br><br>[redacted] stated that the figures used have got the current EA Flood maps but the ICM model has used to drive the assessment.<br><br>[redacted] outlined that WSP wouldadd some text into the FRA and ES Chapter and figures as required. | [redacted] | |

| ITEM | SUBJECT | ACTION | DUE |
|---|---|---|---|
| 8. | Lady Park Burn:<br><br>[redacted] stated that the Lady Park Burn blocks during heavy extreme rainfall (the screen blocks and the watercourse backs up). This overtopped onto the A1 in 2012. [redacted] also stated that there wouldn't be enough water for a 1:5 or 1:10 year event to block the screen. [redacted] also outlined that HE can look on the EA website for levels on Lady Park Burn to inform risk assessment.<br><br>[redacted] stated that this is within the area where only signage changes were taking place – there are no other changes as a result of the Scheme.<br><br>[redacted] outlined that they would like the FRA to consider:<br>• What do Highways England tolerate in this area?<br>• What measures are put in place should it overtop?<br>• Do Highways England put road closures in place?<br>• Should maintenance be put in place from Highways England (however special rakes need to be used to clear the screen)?<br>• Can asset maintainers go out and check if there is a storm event etc.?<br><br>[redacted] outlined that aspect may have been considered as part of the Coal House to Metro Centre scheme.<br><br>[redacted] to locate documents from that scheme, if possible and see if this aspect was considered.<br><br>WSP to include text on this in the ES and that this would be investigated at detailed design (to close this issue out in the ES). | [redacted]<br><br>[redacted] | |

| ITEM | SUBJECT | ACTION | DUE |
|---|---|---|---|
| 9. | Flood Plain Compensation:<br><br>[redacted] described that flood plain compensation has been provided in the Scheme for the climate change scenarios only, and its location is constrained by the location of the surface water attenuation tanks. [redacted] outlined that further information is required to demonstrate that this area will flood at the same time as the lost floodplain. This can be provided through a GIS cross section, as opposed to additional modelling.<br><br>[redacted] stated that from the slides she considered that WSP have done comprehensive modelling. Just need the finer points to demonstrate that the compensation area works – this can be done in a technical note.<br><br>[redacted] to produce technical note or ensure this is closed out in the ES. | [redacted] | |
| 10. | Other:<br><br>[redacted] discussed Allerdene Burn – betterment varies depending on the option. We have optimised the floodplain. We can provide additional betterment for the viaduct option compared to the embankment option.<br><br>[redacted] - Tidal flood risk – this is embedded in the model. Include some information in the FRA to this effect.<br><br>Groundwater Flood Risk - [redacted] detailed that this is in the updated ES chapter and FRA.<br><br>WSP need to consider the model tolerance ([redacted] considers that approx. 20mm) is appropriate for the ICM model. [redacted] | [redacted] | |

| | | | |
|---|---|---|---|
| 11. | WFD Assessment:<br><br>[redacted] discussed that from a WFD point of view – looking at objective year of 2027. Need to get it to "good" status by 2027.<br><br>[redacted] discussed that a sediment vortex separator has been provided on Longacre Dene for woodland – identified as a sensitive receptor. [redacted] outlined that other watercourses are ephemeral and only flow at certain times.<br><br>[redacted] stated that during flashy conditions sediment would be flushed through these channels particularly around the viaduct.<br><br>[redacted] detailed that around the viaduct there will be the settlement pond. At Kingsway viaduct – some water goes to the pond and some water will go through the tanks. Also have oversized pipes.<br><br>[redacted] stated that it was hard to see what flows were going where and would like to understand better.<br>[redacted] to provide the surface water drainage sub catchment plan.<br>[redacted] to provide better referencing through to the FRA from the WFD.<br><br>[redacted] stated that it looked from the report that only the bare minimum had been done to achieve WFD objectives.<br><br>[redacted] stated that you would need to move it in the direction of moving it towards "good". Oil interceptors, hydro-breaks and SuDS will help but it will be the bare minimum. Ideally every structure, culvert and outfall should be assessed and that WSP should look at the suite of mitigation that the WFD Assessment should provide.<br><br>[redacted] also noted that this issue had also been raised on the Testos scheme and Downhill Lane.<br><br>Action to ensure that mitigation is linked back to other chapters – and bring in cross referencing into WFD.<br><br>[redacted] discussed that additional text could be considered in to the WFD included looking at naturalising the channel at Allerdene culvert (currently daylighting), look at the culverts and outfalls for improvements, e.g. flow spreaders, location of outfall, impacts to habitat, naturalised / cobbly outfalls set back from channel. | [redacted]<br><br>[redacted]<br><br>[redacted] | |

| ITEM | SUBJECT | ACTION | DUE |
|---|---|---|---|
| | [redacted] to provide photographs of another scheme to ensure his desires are understood.<br><br>It was agreed that WSP would consider changing the significant effects to beneficial as the measures are “on the path” to betterment with regards to the WFD. | [redacted]<br><br>[redacted] | |

**NEXT MEETING**

An invitation will be issued if an additional meeting is required.

# Appendix 1.5B - Environment Agency Letter 17/12/06

creating a better place

Environment Agency

Planning Inspectorate
Temple Quay House Temple Quay
Bristol
Avon
BS1 6PN

**Our ref:** NA/2017/113874/01-L01
**Your ref:** TR010031-000007

**Date:** 06 December 2017

Dear Sir/Madam

**PLANNING ACT 2008 (AS AMENDED) AND THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017(THE EIA REGULATIONS) – REGULATIONS 10 AND 11**

**APPLICATION BY HIGHWAYS ENGLAND (THE APPLICANT) FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE A1 BIRTLEY TO COAL HOUSE IMPROVEMENT SCHEME (THE PROPOSED DEVELOPMENT) A1 BIRTLEY TO COAL HOUSE IMPROVEMENT SCHEME**

Thank you for referring the above Scoping Opinion which we received on 8 November 2017. We have assessed the information submitted against matters within our remit and have the following comments/advice to offer:

**Flood Risk**
A Flood Risk Assessment should be undertaken to address the flood risks during the construction phase of the A1 widening and the permanent works. In particular, the Flood Risk Assessment should take into account the following matters:

Climate change allowance must be factored into the design of the road and drainage; and
Floodplain compensation for any loss of the floodplain must be provided. This should include the provision of climate change.

The scoping report makes reference to working with other flood risk management authorities to join the delivery of wider strategic flood alleviation schemes. We welcome and support this approach.

We would welcome opportunities for environmental betterment, in particular opportunities to reduce surface water flood risk. This issue was highlighted and discussed at a meeting on 31 October 2017 with the consultants managing the application and Gateshead Council.

Tyneside House, Skinnerburn Road, Newcastle Business Park, Newcastle upon Tyne, NE4 7AR.
Customer services line: 03708 506 506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

**Flood Risk Modelling**

The Environment Agency's 2016 Team Valley flood risk model should be used to inform the proposed development. The existing Team Valley hydraulic model was constructed in 2011, and updated in 2016 by JBA on behalf of the Agency. The purpose of the update was to test the impact of all options proposed in the Project Appraisal Report (PAR) and to improve the understanding of the flood risk within the Team Valley area from the western tributaries. This information is available upon request. Any request for data should be sent to our Customer and Engagement Team at northeast-newcastle@environment-agency.gov.uk

It is noted that section 15.7.7 states 'where hydraulic modelling is required this will be undertaken in accordance with Methods E and F of HD45/09". It is considered that hydraulic modelling will be required in support of the National Significant Infrastructure Project (NSIP) application.

**Flood Risk Permits**

Within your site boundary is a designated "main river" and under the Environmental Permitting Regulations 2010, you may require an environmental permit for flood risk activities. If you want to do work within 8 metres of a non-tidal sections, or 16 metres of the tidal section, instance where work is proposed:

a) in, under or near a main river ( including where the river is in a culvert;
b) on or near a flood defence on a main river c)in the floodplain of a main river
d) on or near a sea defence.

You can find out more information on permit requirements using the following link: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits. If a permit is required, it must be obtained prior to beginning the works. The applicant is advised to contact the Environment Agency to discuss the issues likely to be raised.

**Water Framework Directive**

The proposed works will affect the River Team (Source to Tyne, GB103023075670). This waterbody is currently classified under the Water Framework Directive (WFD) as Moderate. This Heavily Modified Waterbody is impacted by urbanisation from the highway network. In particular, sedimentation, hydrocarbons and road salt from highway infrastructure has affected the water quality of the River Team.

The WFD seeks to improve the water quality in all our waterbodies (including lakes, rivers and estuaries). In particular, it seeks to ensure that all waterbodies achieve 'good status' or 'good ecological potential'. The environmental objectives of the WFD are:

to prevent deterioration of the status of surface waters and groundwater
to achieve objectives and standards for protected areas

to aim to achieve good status for all water bodies or, for heavily modified water bodies and artificial water bodies, good ecological potential and good surface water chemical status

to reverse any significant and sustained upward trends in pollutant concentrations in groundwater

the cessation of discharges, emissions and loses of priority hazardous substances into surface waters

progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants

The Northumbria River Basin Management Plan provides the overarching framework for all decisions that are relevant to water management to ensure the protection and improvement of the water environment.

The overall objectives of the Northumbria RBMP is to 1) prevent deterioration 2) deliver protected area objectives 3) deliver improvements that make progress towards 2027 objectives where the benefits are greatest. Environmental objectives have been set for each of the protected areas and waterbodies in the Northumbria river basin district. Highway England must have regard to these objectives when making decisions that could affect the water environment.

It is considered that the proposed development provides a great opportunity to implement WFD mitigation measures and river restoration. This could include deculverting and enhancements to the river environment, such as fish and mammal passage and water quality improvements. The use of sustainable drainage systems combined with oil interceptors would be a recognised way to improve the water quality from the highway draining into the watercourses.

**Biodiversity and Ecology**
Any works over the River Team must maintain or enhance the riparian corridor. Article 10 of the Habitats Directive, stresses the importance of natural networks of linked corridors to allow movement of species between suitable habitats, and promote the expansion of biodiversity. Such networks may also help wildlife adapt to climate change.

We would welcome any opportunities for the development to contribute to improvement measures for the River Team. This could include local proposals to restore natural conditions in the river corridor and Lamesley Pastures conservation area and the wider vicinity.

There may be operational and/or post construction impacts to invertebrates in the

area. For example, artificial lighting could impact upon feeding, breeding and movement of insects. We would request that number of lights and brightness should be assessed to avoid light spillage. This would be particularly important next to River Team. Risks should be minimised or eliminated where possible. We would also request that any planting schemes include native plants of local provenance.

**Protected Species**
The proposed development must ensure that protected species which could be directly or indirectly affected by the proposal are considered. European Otter records have been found in the vicinity. They are protected under Habitat Directive Annex 4, Wildlife and Countryside Act Schedule 5 and Natural Environment and Rural Communities Section 41.

Amphibians including Great Crested Newt may be present within the construction site. They are protected under Habitat Directive Annex 2. The ecological report stated that desktop studies suggested that Water Vole may be present within 1km. Water Vole are protected under Schedule 5 of the Wildlife and Countryside Act.

**Fisheries**
With respect to section 10.7.8 to 10.7.13, the evaluation of the ecological resources should extend to fish populations of the River Team. Whilst these are known to be very poor, due to water quality and other issues. Brown Trout and Eels, are present in the river and Atlantic salmon have recently been recorded in the Eslington area. All of these species are of high conservation value and as such carry protected species status. Data on fish populations of the Team can be found on open access here: https://data.gov.uk/dataset/freshwater-fish-counts-for-all-species-all-areas-and-all-years). Please refer to the Fisheries Classification Scheme output for the Kibbleworth. They are also sensitive receptors to any impacts from the scheme such as pollution and habitat degradation. Given their impoverished status, any opportunity the scheme provides to improve the habitat in the Team for fish should also be taken.

**Geomorphology**
Morphology is a supporting element under WFD. The NSIP should assess any impact on the geomorphology of the watercourses that are crossed by the carriageway and the processes that determine the fluvial geomorphology. This would include (but is not limited to) any changes to crossings, alterations to piers, extension to culverts and alterations to the bed or banks (temporary or permanent). Where impacts are found, the Environmental Impact Assessment should outline how these can be mitigated e.g. deculverting of the existing converted watercourses.

**Land contamination**

Tyneside House, Skinnerburn Road, Newcastle Business Park, Newcastle upon Tyne, NE4 7AR.
Customer services line: 03708 506 506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

creating a better place

The Environment Agency does not hold detailed information on the history, in terms of its previous use(s), or the current condition, of the land in the area under consideration. As such, we are unable to assess whether the land may be affected by contamination.

It is the responsibility of the landowner/developer to identify land affected by contamination and to ensure that remediation is undertaken to ensure a safe development. If there is a possibility of risks associated with land contamination to be present at the development site, we recommend that the applicant undertakes a risk assessment (RA) to quantify any risks and recommend remedial works. Further information can be found in 'Guiding Principles for Land Contamination (2010)' which provides guidance for applying a risk management process when dealing with land affected by contamination.

**Groundwater**
The applicant should undertake a Hydrogeological Risk Assessment (HRA) if there are risks to groundwater from the proposed development.

Please do not hesitate to contact me if you have any questions regarding this letter.

Yours faithfully

**Lucy Mo**
**Planning Technical Specialist - Sustainable Places**

Direct dial 020847 46524
Direct e-mail lucy.mo@environment-agency.gov.uk

# Appendix 1.5C - Flood Modelling Response to EA Comments

# TECHNICAL NOTE

| | | | |
|---|---|---|---|
| **DATE:** | 28 January 2020 | **CONFIDENTIALITY:** | Public |
| **SUBJECT:** | Flood Modelling Response to EA Comments | | |
| **PROJECT:** | A1 BCH | **AUTHOR:** | Chris Parker |
| **CHECKED:** | | **APPROVED:** | Andy Smith |

## INTRODUCTION

This note has been prepared to provide responses to the clarifications requested by JBA on behalf of the Environment Agency, to enable the approval of the hydraulic models that support the FRA for the Highways England A1 Birtley to Coal House scheme. This note is intended to be read in conjunction with the JBA review sheet that provides the comments in line. The ID from the JBA comment sheet has been used in the section headings in this technical memo to identify where a comment has been addressed. Only points identified in our Technical Note 1 dated 29th October and agreed with the Environment Agency (email from Lucy Mo, 14th November 2019) have been covered, in this Technical Note.

Each of the three topics in the Environment Agency review have been addressed in turn these are Hydrology, Hydraulics - River Team and Hydraulics – Allerdene Burn. This review has been supported by the provision of the following documents information have been provided to support this note:

1. JBA review sheet (2018s0387-57_A1_BCH_Review_v2
2. Updated ICM model files
3. River Team DTM
4. Allerdene Burn DTM

## HYDROLOGY

**ID: A-6: NO FURTHER REPORTING GIVEN ON HOW THE CHANGE IN CATCHMENT AREA INFLUENCES OTHER KEY CATCHMENT DESCRIPTORS. DPLBAR SHOULD INCREASE, AND THERE COULD BE SIGNIFICANT CHANGES TO URBEXT2000 FROM THE CHANGE IN CATCHMENT BOUNDARY. BOTH OF THESE NEED TO BE ALTERED, AND COULD HAVE A BIG EFFECT ON CALCULATED FLOWS.**

The catchment area has been delineated in GIS and has been compared to the URBEXT coverage, both of which are shown in Figure 1. The catchment descriptors have been updated in line with the identified change in catchment area, these are documented in Table 1

# TECHNICAL NOTE

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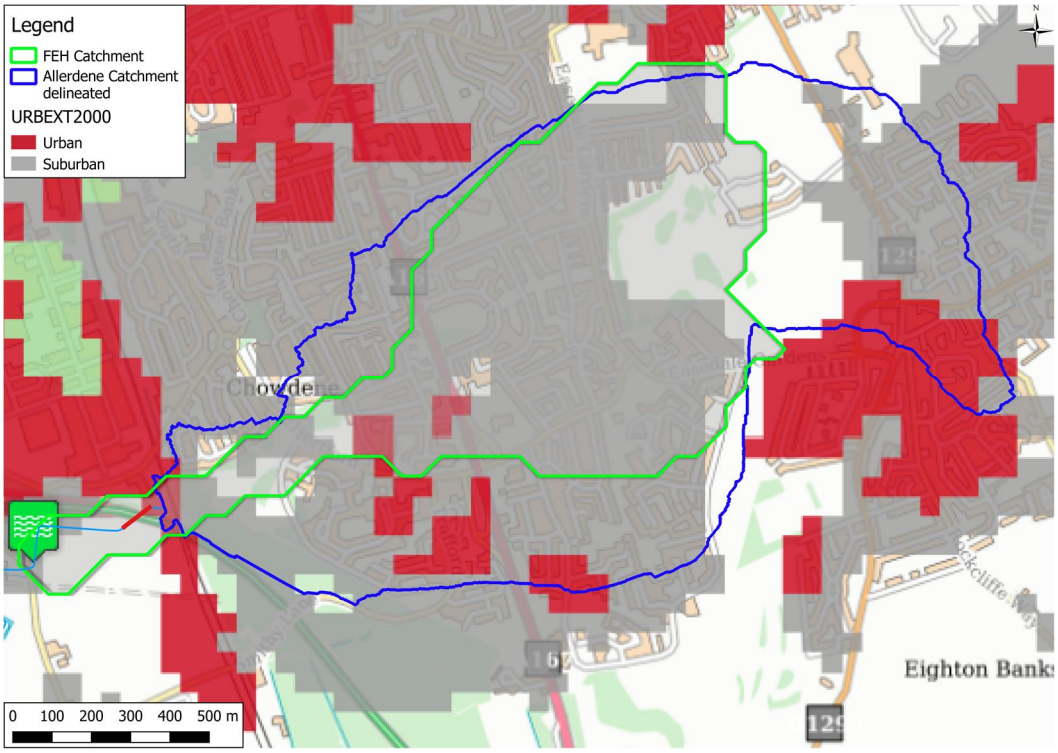


*Figure 1: URBEXT Map*

*Table 1: Updated catchment descriptors (refined descriptors shown in red)*

| Descriptor | FEH Catchment | Adopted Catchment |
|---|---|---|
| **AREA** | 0.9075 | 1.688 |
| **BFIHOST** | 0.682 | 0.682 |
| **DPLBAR** | 1.65 | **2.31** |
| **DPSBAR** | 82 | 82 |
| **FARL** | 1 | 1.000 |
| **SPRHOST** | 12.12 | 12.12 |
| **$URBEXT_{1990}$** | 0.2948 | **0.4600** |
| **$URBEXT_{2000}$** | 0.3747 | **0.5620** |

The approach and reasons for the updates to the catchment descriptors are detailed below:

§ **DPLBAR** updated based on formula within FEH calc-sheet (new DPLBAR = New Area^0.548). 0.9075^0.548 = 0.948. 1.65 / 0.948 = 1.741. 1.688^0.548 = 1.33. 1.33 x 1.741 = 2.31.

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- **URBEXT** updated based on determining the extent of urban / suburban areas are in the additional part of the catchment, using the URBEXT map from the FEH Webservice. Work out total percentage of urban/suburban area $URBAN_{50K}$.
- **$URBEXT_{2000}$** = 0.629 x $URBAN_{50K}$.
- **$URBEXT_{2000}$** then multiplied by $UEF_{2000}$ for 2019 (1.04).
- **FARL** checked against online mapping and no changes are needed as there are no lakes in the additional area.
- **BFIHOST** and **SPRHOST** checked against online BGS Geology mapping and online soil mapping (soil scape). The geology and soils in the larger catchment area is still the same. Sandstone with bands of Coal measures, overlain by slowly permeable loamy and clayey soils.

The potential impact of these changes on the calculated flows is considered in response to comment A-12 which presents the latest ReFH2 flow estimates.

**A-12: ADD A TABLE COMPARING FEH99 AND FEH13 RAINFALLS TO BACK UP THE ARGUMENT GIVEN IN CHAPTER 2 OF APPENDIX A. RUN THE REFH2 MODEL FOR THE 100 AND 1,000YR EVENTS WITH THE FEH13 RAINFALL ALSO, TO TEST IF THIS GIVES LARGER PEAK FLOWS, DUE TO THE "ALPHA" ISSUE.**

The ReFH2 derived flows have been recalculated (within the ReFH2 software v2.2 and not within ICM) with the refined catchment descriptors as detailed in A-6, the revised flows are detailed in Table 2 and the growth curves in Figure 2, both are below, the key aspects / findings are:

- A comparison of 2013 and 1999 rainfall models along with the winter and summer storms was undertaken.
- The use of summer rainfall substantially increases flows – this has been adopted given the urban nature of the catchment.
- Flows estimated using the 1999 rainfall are marginally higher than the 2013 rainfall, as shown in Table 2.

*Table 2 ReFH Flow Estimates*

| Peak Flow ($m^3/s$) at given Return Period | FEH 1999 Rainfall | | | FEH 2013 Rainfall | | |
|---|---|---|---|---|---|---|
| | 2.5hr | 3.5hr | 8.5hr | 2.5hr | 3.5hr | 8.5hr |
| 2 | 0.86 | 0.943 | 0.944 | 0.755 | 0.839 | 0.84 |
| 20 | 1.67 | 1.795 | 1.725 | 1.527 | 1.627 | 1.52 |
| 100 | 2.53 | 2.691 | 2.521 | 2.221 | 2.357 | 2.2 |
| 1000 | 4.57 | 4.786 | 4.333 | 4.005 | 4.193 | 3.77 |
| Growth factor at given Return Period | | | | | | |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 20 | 1.93 | 1.9 | 1.83 | 2.02 | 1.94 | 1.8 |
| 100 | 2.93 | 2.85 | 2.67 | 2.94 | 2.81 | 2.61 |
| 1000 | 5.29 | 5.08 | 4.59 | 5.3 | 5 | 4.46 |

# TECHNICAL NOTE

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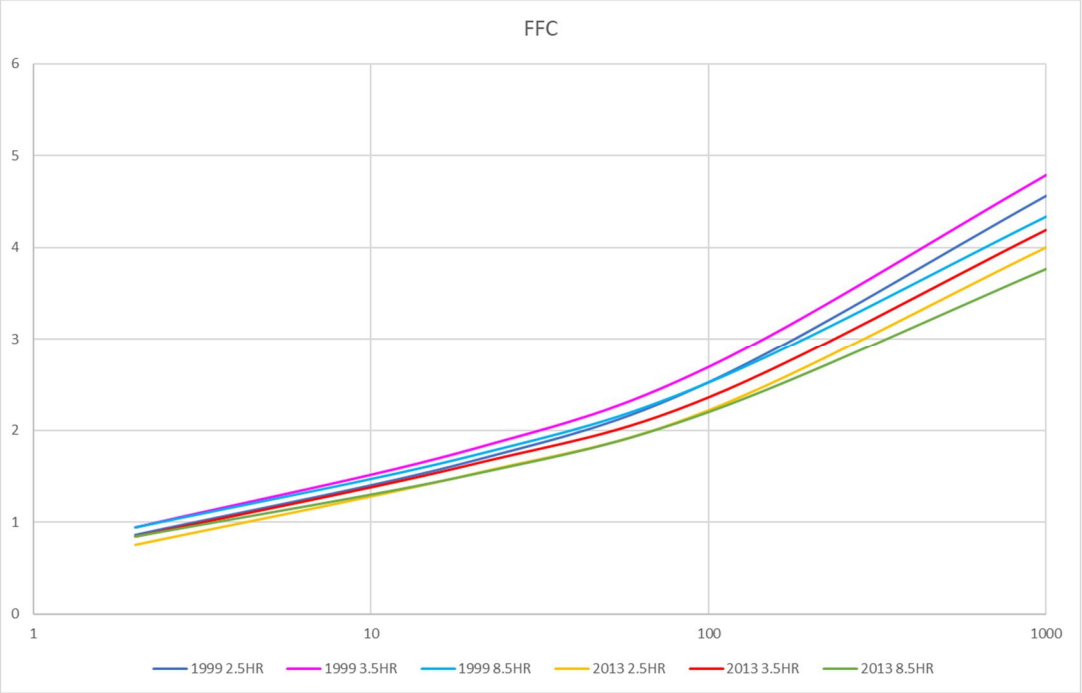


*Figure 2 ReFH2 Growth Curves*

**A-23 (CHOICE OF DESIGN STORM): RUN THE REFH2 MODEL FOR A RANGE OF STORM DURATIONS TO SEE WHICH GIVES THE LARGEST PEAK FLOWS FOR ALLERDENE BURN.**

As shown in Table 2 the ReFH2 model was run with a range of storm durations, the design duration is 3.5 hrs, as the highest flows are observed here. The impacts of different durations have been tested using 2.5-hour and 8.5-hour storms.

**A-15-A-20: RUN THE FEH STATISTICAL METHOD AS A CHECK IN REFH2 RESULTS.**

The FEH Statistical method has been undertaken as a check against the ReFH2 results the approach to this is outlined below:

*FEH STATISTICAL*

This has been undertaken using:

- Winfap v4.1
- NRFA Peak Flow Dataset V8

# TECHNICAL NOTE

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*QMED*

- The Team Valley gauge is located just downstream of the catchment; however, the catchment area of this gauge is 61.9 km$^2$ (approximately 36x larger than the subject catchment), so it is not considered to be a suitable donor.
- The Ouse Burn at Woolsington is located approximately 13km northwest of the subject catchment, and has an area of 9km$^2$, however BFIHOST at this catchment is 0.312, which is significantly lower than the subject site, so it is not considered to be an appropriate donor.
- Other nearby catchments: 23007, 24009, &, 23001 are all significantly larger than the subject catchment so are not suitable donors.
- Stations 23016 and 22081 are marked as not suitable for QMED on the NRFA website.
- Therefore, QMED for the Allerdene Burn catchment has been calculated through the catchment descriptors approach, which gives 0.184 m$^3$/s and 0.418 m$^3$/s once urbanised.

*POOLING GROUP*

- Table 3, below, sets out the initial pooling group from WINFAP and the adjustments made to the pooling group (PG1 is the adopted group).

*Table 3: Pooling group composition*

| Station | Distance | Years of data | QMED AM | AREA | SAAR | FPEXT | FARL | URBEXT 2000 | BFIHOST | SPRHOST | PG0 | PG1 | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 76011 | 1.063 | 41 | 1.84 | 1.63 | 1096 | 0.074 | 1 | 0 | 0.196 | 58.93 | Yes | No | BFI Too Low |
| 27051 | 2.266 | 46 | 4.539 | 8.17 | 855 | 0.013 | 1 | 0.006 | 0.309 | 40.77 | Yes | Yes | |
| 45816 | 2.275 | 25 | 3.456 | 6.81 | 1210 | 0.011 | 1 | 0.005 | 0.59 | 31.27 | Yes | Yes | |
| 28033 | 2.564 | 43 | 4.205 | 7.92 | 1346 | 0.007 | 1 | 0 | 0.403 | 42.5 | Yes | Yes | |
| 25019 | 3.093 | 40 | 5.384 | 15.09 | 830 | 0.019 | 1 | 0.004 | 0.524 | 38.58 | Yes | Yes | |
| 26802 | 3.139 | 19 | 0.109 | 15.85 | 757 | 0.03 | 1 | 0 | 0.959 | 5.67 | Yes | Yes | Permeable adjustment applied |
| 27073 | 3.163 | 37 | 0.82 | 8.06 | 721 | 0.237 | 1 | 0.008 | 0.887 | 17.77 | Yes | Yes | Permeable adjustment applied |
| 91802 | 3.215 | 34 | 6.35 | 6.54 | 2554 | 0.003 | 0.992 | 0 | 0.397 | 53.31 | Yes | Yes | |
| 25011 | 3.216 | 32 | 15.533 | 12.79 | 1463 | 0.012 | 1 | 0.001 | 0.237 | 58.21 | Yes | No | BFI Too Low |
| 47022 | 3.254 | 25 | 6.18 | 13.43 | 1403 | 0.023 | 0.942 | 0.014 | 0.431 | 44.18 | Yes | Yes | |
| 71003 | 3.266 | 37 | 10.9 | 10.71 | 1882 | 0.016 | 1 | 0 | 0.276 | 54.51 | Yes | No | BFI Too Low |
| 49005 | 3.268 | 8 | 6.511 | 16.08 | 1044 | 0.023 | 0.991 | 0.006 | 0.627 | 31.92 | Yes | No | Record Length too short |
| 25003 | 3.346 | 45 | 15.12 | 11.4 | 1905 | 0.041 | 1 | 0 | 0.227 | 59.86 | Yes | No | BFI Too Low |
| 54022 | 3.422 | 38 | 14.988 | 8.75 | 2481 | 0.01 | 1 | 0 | 0.323 | 52.68 | Yes | Yes | |
| 27010 | 3.463 | 41 | 9.42 | 18.82 | 987 | 0.009 | 1 | 0.001 | 0.341 | 50.58 | Yes | Yes | |
| 206006 | 3.503 | 48 | 15.33 | 14.44 | 1704 | 0.023 | 0.981 | 0 | 0.336 | 51.72 | No | Yes | |
| 44008 | 3.565 | 39 | 0.448 | 20.18 | 1012 | 0.015 | 1 | 0.004 | 0.811 | 19.53 | No | Yes | Permeable adjustment applied |
| 27032 | 3.894 | 52 | 3.923 | 22.25 | 1433 | 0.021 | 0.997 | 0 | 0.252 | 57.36 | No | No | BFI Too Low |
| 36010 | 3.911 | 51 | 7.5 | 27.58 | 588 | 0.045 | 0.999 | 0.007 | 0.387 | 44.57 | No | Yes | |
| 49003 | 3.968 | 52 | 13.985 | 21.61 | 1628 | 0.064 | 0.998 | 0 | 0.379 | 47.75 | No | Yes | |

# TECHNICAL NOTE

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*PERMEABLE ADJUSTMENTS*

As the subject catchment has an SPRHOST of 12.12%, permeable adjustments are necessary (based on guidance detailed in FEH Volume 3, which states this is required for catchments with an SPRHOST less than 20%). In the adopted pooling group (PG1), three catchments were identified as needing permeable adjustments (26802, 27073 & 44008). The final growth and flood frequency curves are detailed in Table 4.

*Table 4: PG1 Permeable Adjustment Results*

| Return Period | **2** | **10** | **20** | **30** | **50** | **100** | **200** | **500** | **1000** |
|---|---|---|---|---|---|---|---|---|---|
| Growth Curve | 1.00 | 1.744 | 2.088 | 2.308 | 2.610 | 3.072 | 3.604 | 4.437 | 5.183 |
| Flood Frequency Curve | 0.418 | 0.729 | 0.873 | 0.965 | 1.091 | 1.284 | 1.506 | 1.855 | 2.166 |

*REFH1*

As a further check the ReFH1 method has also been used the findings are below:

*PARAMETERS FOR REFH MODEL – FEH1999 RAINFALL*

| **Site code** | **Method:** OPT: Optimisation BR: Baseflow recession fitting CD: Catchment descriptors DT: Data transfer (give details) | **Tp (hours)** Time to peak | **$C_{max}$ (mm)** Maximum storage capacity | **BL (hours)** Baseflow lag | **BR** Baseflow recharge |
|---|---|---|---|---|---|
| Allerdene_001 | CD | 0.736 | 545.275 | 14.854 | 1.646 |

*DESIGN EVENTS FOR REFH METHOD*

| **Site code** | **Urban or rural** | **Season of design event (summer or winter)** | **Storm duration (hours)** | **Storm area for ARF** (if not catchment area) |
|---|---|---|---|---|
| Allerdene_001 | Urban | Summer | 1.25 | - |

# TECHNICAL NOTE

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*FLOOD ESTIMATES FROM THE REFH METHOD*

| Site code | Flood peak ($m^3/s$) for the following return periods (in years) | | | |
|---|---|---|---|---|
| | **2** | **20** | **100** | **1000** |
| Allerdene_001 | 0.491 | 0.941 | 1.342 | 2.718 |
| *Growth curve_001* | *1* | *1.916* | *2.733* | *5.536* |

*COMPARISON OF METHODS*

To ensure that the most appropriate flows are used within the hydraulic model to understand the potential impacts of the Scheme on the flood regime a comparison of the methods, as refined, in light of the discussion in the previous sections, is presented below:

*Table 5: Flood Frequency Curve comparison*

| **Peak Flow ($m^3/s$) at given Return Period** | **ReFH2** | | **ReFH1** | **FEH Statistical Method** | **Results from previous study** |
|---|---|---|---|---|---|
| | **FEH 1999** | **FEH 2013** | | | |
| **2** | 0.943 | 0.839 | 0.491 | 0.418 | - |
| **20** | 1.795 | 1.627 | 0.941 | 0.729 | - |
| **100** | 2.691 | 2.357 | 1.342 | 1.204 | 1.996 |
| **1000** | 4.786 | 4.193 | 2.718 | 2.166 | 3.576 |

*Table 6: Comparison of the effect of FEH 1999 and 2013 winter and summer rainfall on Growth factors of ReFH2 flows*

| Growth Factor at given Return Period | ReFH2 | | ReFH1 | FEH Statistical Method |
|---|---|---|---|---|
| | FEH 1999 | FEH 2013 | | |
| 2 | 1.000 | 1.000 | 1.000 | 1.000 |
| 20 | 1.904 | 1.940 | 1.916 | 2.088 |
| 100 | 2.854 | 2.810 | 2.733 | 3.072 |
| 1000 | 5.076 | 4.998 | 5.536 | 5.183 |

The tables outline the differences between the results from the different ReFH2 runs and the FEH statistical method, this demonstrates that:

- The flows from the FEH statistical method are significantly lower.
- Whilst the growth curves for ReFH2 and FEH Statistical are similar, the QMED (derived from the statistical method) is significantly lower hence the lower flows at the higher return periods.

In light of this assessment we have adopted the ReFH2 flows with FEH 2013 rainfall for use within the assessment because:

- Given the permeable nature of the catchment, ReFH flows are unreliable.
- The FEH Statistical method is often preferred for permeable catchments and a permeable adjustment was undertaken, however the flows from this method are substantially lower than the ReFH2 flows, therefore the ReFH2 flows are preferred as a more conservative approach.
- Although using the FEH1999 rainfall within ReFH2 does give slightly larger flows than FEH2013 rainfall, the FEH1999 rainfall uses the alpha factor which is not reliable in permeable catchments. Given that the subject site is permeable, using the FEH2013 rainfall is deemed more appropriate.

As part of the addressing the hydraulics comments the models have been re-run with the adopted flows. Any significant changes / implications are discussed in the relevant sections below.

**ID: A-1 WHY WAS FLUVIAL MODELLING NOT UNDERTAKEN AT LONGACRE DEAN; AND**

**ID: A-32 THERE IS NO INFORMATION GIVEN ON THE RANGE OF STORM DURATIONS USED IN THIS DIRECT RAINFALL MODELLING IN THE REPORT.**

The Scheme has the potential for significant impacts on the Allerdene Burn as the culvert will be replaced (Allerdene Embankment Option) or a new channel will be constructed (Allerdene Viaduct Option), greater certainty in the flows and associated impacts were required.

In the Longacre Dean catchment a direct rainfall model was utilised, a separate fluvial model was not deemed necessary as:

- The risks to the scheme as a result of fluvial flooding were not considered to be significant
- The proposals do not impact the main channel.

This is because at Longacre Dean the culvert is substantially lower than the road, with no flow route on to the A1. The surface flow routes to the channel are of interest and the main risk to the Scheme in this area was identified as being surface water related associated with the slip road for which the potential flow routes and depths were assessed.

The ReFH2 software was used to develop the net hyetographs for use within the model, as part of this the 1, 3, 6 & critical duration (hr) storms were assessed for both the 1999 and 2013 rainfall. The model has been run with the 1, 3 and 6 hour durations, which confirm that the 1 hour produces the most flooding, in

the area of interest. However, as requested all the durations have been run and the results merged to obtain the greatest flood depths. The resultant 1 in 100 year flood map is shown on Figure 3.

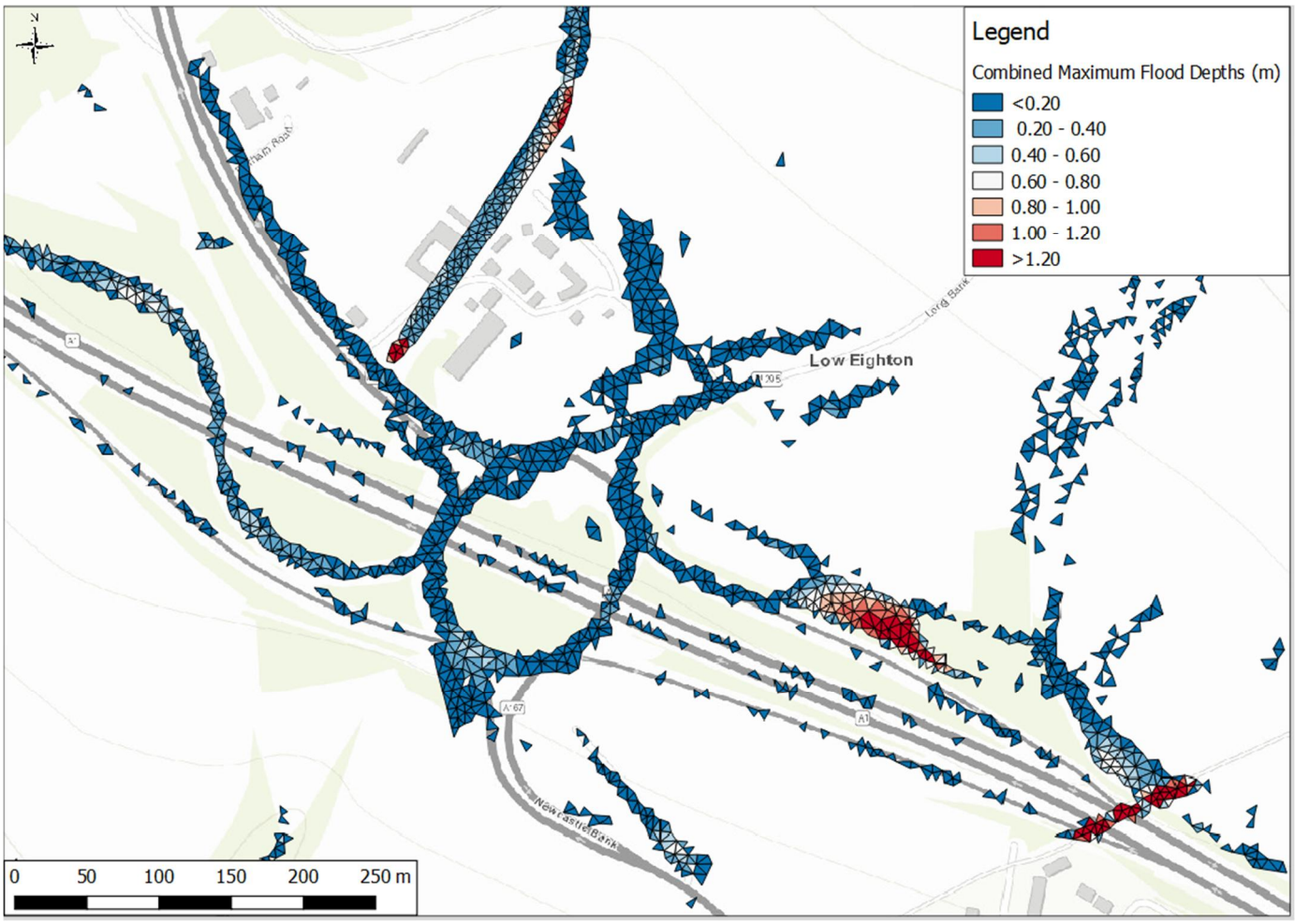


*Figure 3: J66 Flood Depths for the 1 in 100 year (1%) event*

The hyetograph's were developed using the catchment descriptors for the Allerdene Burn FEH catchment (after undertaking checks against the available online mapping, which identified that the values for BHIHOST, SPRHOST and FARL were deemed appropriate ) with AREA, DPLBAR & URBEXT adjusted as described below, with the resultant descriptors contained in Table 7.

*Table 7 Junction 66 Catchment Descriptors*

| Descriptor | Allerdene FEH Catchment | LiDAR J66 catchment |
|---|---|---|
| **AREA** | 0.9075 | 0.817 |
| **BFIHOST** | 0.682 | 0.682 |
| **DPLBAR** | 1.65 | **1.56** |
| **DPSBAR** | 82 | 82 |
| **FARL** | 1 | 1.000 |
| **SPRHOST** | 12.12 | 12.12 |
| **URBEXT2000** | 0.3747 | **0.236** |

- **DPLBAR** updated based on formula within FEH calc-sheet (new DPLBAR = New Area^0.548). 0.9075^0.548 = 0.948. 1.65 / 0.948 = 1.741. 0.817^0.548 = 0.895. 0.895 x 1.741 = 1.558.
- **URBEXT** updated based on determining the extent of urban / suburban areas are in the additional part of the catchment, using the URBEXT map from the FEH Webservice. Work out total percentage of urban/suburban area $URBAN_{50K}$
- **$URBEXT_{2000}$** = 0.629 x $URBAN_{50K}$.
- **$URBEXT_{2000}$** then multiplied by UEF2000 for 2019 (1.04).
- **FARL** checked against online mapping and no changes are needed as there are no lakes in the additional area.
- **BFIHOST** and **SPRHOST** checked against online BGS Geology mapping and online soil mapping (soil scape). The geology and soils in the larger catchment area is still the same. Sandstone with bands of Coal measures, overlain by slowly permeable loamy and clayey soils.
- For **URBEXT** there are 0.295km$^2$ of urban / suburban area as measured from the georeferenced UBREXT map in QGIS.
- $URBAN50k$ = 0.295/0.817 × 100 = 36.11%
- **URBEXT** = 0.227 pre UEF adjustment and 0.236 post UEF adjustment

# HYDRAULICS - RIVER TEAM

### ID: B-16 PROVISION OF DIGITAL TERRAIN MODELS

A digital terrain model that incorporate topographic survey has been provided.

### ID: B-29 MODEL STABILITY AND B-143 OUT OF BANK OSCILLATIONS

Lowering the bank line modular limit to 0.6 for the TEAM_5156.1 river reach improved left bank flow for the option model, as shown in Figure 4, but caused the original basemodel provided by the EA to fail. The change in modular limit had no impact on in channel flows. The stability problem seems to be a wider issue with the model for example, river reach TE05820.1 directly upstream of the Kingsway Viaduct, shown in Figure 5, shows significant oscillations to in channel and left bank flows. Resolving stability issues with the wider approved and provided Environment Agency model (as developed by JBA) is not required as part of

the evidence base for the Scheme. This is because the A1 is significantly elevated above the River Team and its associated floodplain at this point on a viaduct and the only impacts occur in the future climate change scenarios when the additional bridge piers require a small amount of floodplain compensation (12m$^3$). The model is therefore considered suitable to assess the scale and nature of the proposed impacts.

An attempt was made to improve channel conveyance of river reach TEAM_5156.1 however, this resulted in the model failing to run.

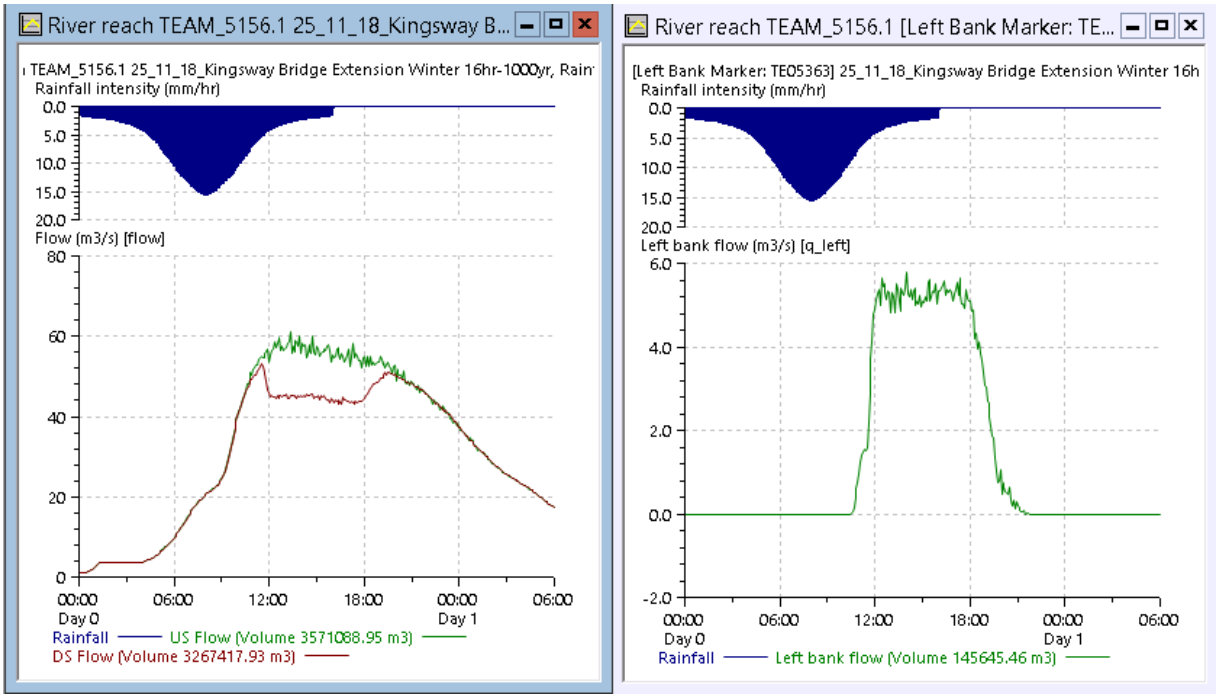


*Figure 4: Improvements to channel and left bank flows for the Kingsway Viaduct river reach (TEAM_5156.1) because of lowering the bank modular limits to 0.6 (option model)*

# TECHNICAL NOTE

| | | | |
|---|---|---|---|
| **DATE:** | 28 January 2020 | **CONFIDENTIALITY:** | Public |
| **SUBJECT:** | Flood Modelling Response to EA Comments | | |
| **PROJECT:** | A1 BCH | **AUTHOR:** | Chris Parker |
| **CHECKED:** | | **APPROVED:** | Andy Smith |

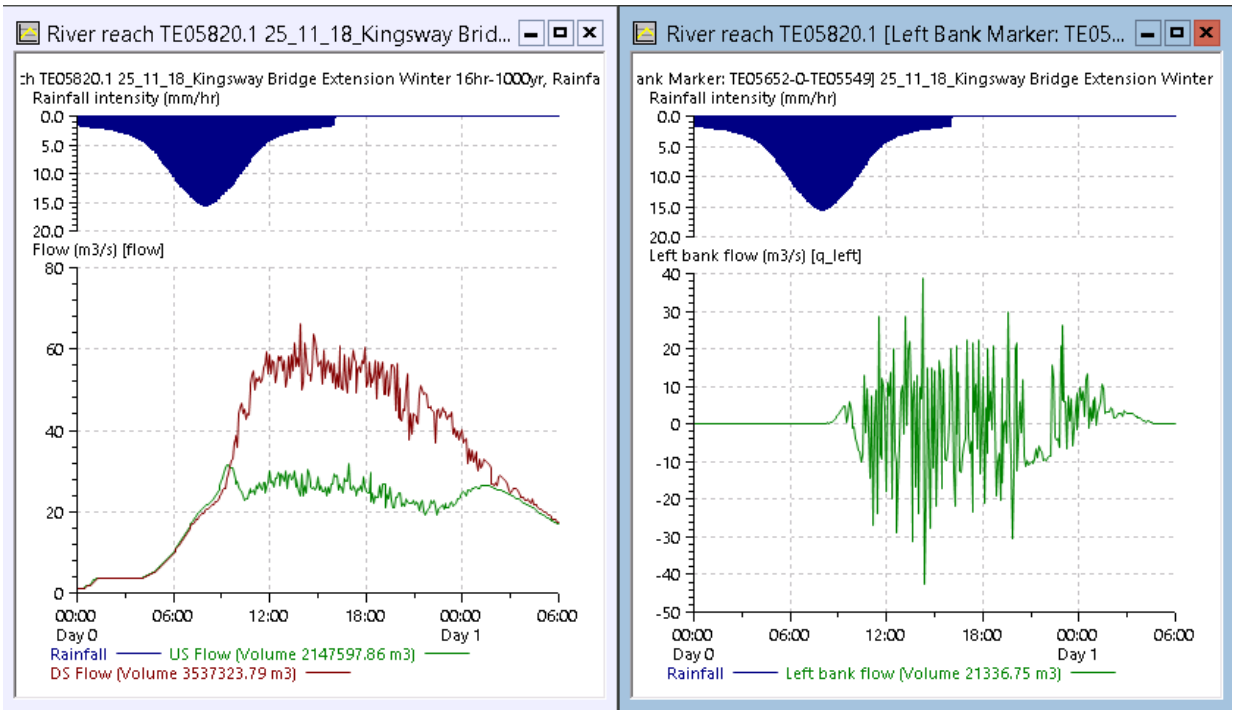


*Figure 5: Channel and left bank flows for the river reach TE05820.1, directly upstream of the Kingsway Viaduct, showing stability issues for the 1 in 1000 year flow event highlighting the stability issue with the wider model (option model)*

**ID: B-137 SENSITIVITY TESTS**

The sensitivity tests were not originally provided however, only sensitivity of channel roughness was undertaken and this is summarised below:

*Table 8: Sensitivity Analysis for the River Team at the Kingsway Viaduct*

| Sensitivity Test | Model changes | Description of sensitivity test and outcome |
|---|---|---|
| **Downstream Boundary** | Channel Roughness Mannings +/- 20% | Channel Mannings roughness value in the model was varied by +/- 20%.<br><br>Increasing channel roughness has minimal impact on maximum predicted depths at the Kingsway Viaduct reach (Team_5156.1), shown in Figure 10, with depth varying by +0.034m to -0.045m. This is considered to be within the acceptable model tolerance limits. |

# TECHNICAL NOTE

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| **CHECKED:** | | **APPROVED:** | Andy Smith |

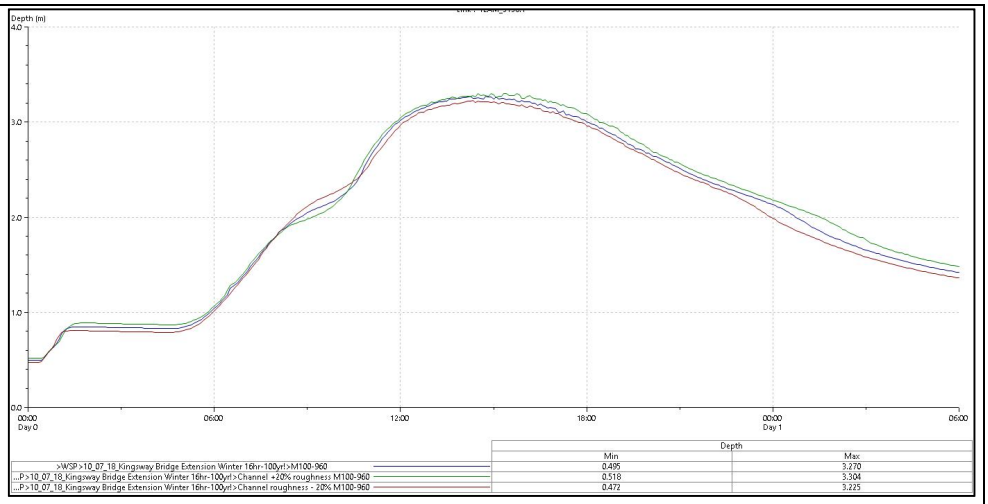



*Figure 6: Flow hydrographs (top) and water depth (bottom) at the Kingsway Viaduct river reach for 1 in 100 year flows.*

### ID: B-139 BASELINE 0.1% EVENT

The baseline 0.1% event has now been run to completion, this required changes to the tolerances, however, it did not establish any issues.

### ID: B-137 MODEL PERFORMANCE TESTS

No calibration was undertaken as this was deemed outside of the scope of the project considering both the minor amendments made to the model and the proposed A1 scheme. As outlined above only approximately 12m$^3$ of flood plain compensation is required for the additional bridge piers

## HYDRAULICS - ALLERDENE BURN

### INTRODUCTION

The updates to the hydrology as detailed previously have resulted in increases to the peak flows, unfortunately this means that the original mitigation options no longer perform as intended. Therefore, the mitigation options have been refined to maintain or improve current flood risk.

**Error! Reference source not found.** shows the modelled predicted peak flows prior to and following the revision to the hydrology. The refinements to the mitigation has included the incorporation of additional flow controls within the proposed channels to maximise channel storage. Full descriptions of the options can be found in the Scenario Clarification section below. These mitigation options have been progressed to the

same level of detail as those originally proposed within the FRA and the Road Drainage and Water Resources ES Chapter, in that they are appropriately designed for this stage and will require refinement during the detail design phase.

*Table 9 : Predicted peak flows at river reach ST02 DS.1 for the Baseline Scenario and Options 1 and 2, grey and green cells show the predicted peak flows prior and following the hydrology revision respectively.*

| Hydrology | Scenario | Flood Peaks Flow ($m^3/s$) | | | |
|---|---|---|---|---|---|
| | | 1 in 100 year (1% AEP) | 1 in 100 year (1% AEP+25%) | 1 in 100 year (1% AEP +50%) | 1 in 1000 year (0.1% AEP) |
| Original | Baseline | 2.16 | 2.53 | 2.68 | 2.85 |
| | Option 1 | 2.10 | 2.51 | 2.65 | 2.83 |
| | Option 2 | 2.14 | 2.53 | 2.70 | 2.82 |
| Revised | Baseline | 2.36 | 2.63 | 2.80 | 2.94 |
| | Option 1 | 2.28 | 2.63 | 2.64 | 2.65 |
| | Option 2 | 2.21 | 2.44 | 2.47 | 2.47 |

**ID: B-8 SCENARIO CLARIFICATION**

Two options have proposed in the ES with respect to the Allerdene Bridge replacement and the modifications to the Allerdene Culvert:

1. Allerdene embankment option, whereby the Allerdene Culvert will be lengthened downstream to accommodate the bridge replacement and the upstream section will be daylighted to reduce the length of the resulting culvert. Furthermore, an approximate 300m of the open section of the watercourse downstream will be realigned parallel to the new bridge.
2. ii. Allerdene viaduct option: whereby the Allerdene Culvert will be replaced by an engineered open channel and the existing watercourse downstream will be realigned to accommodate the new viaduct. The proposed channel (new section and realignment) will be approximately 620m in length and will run under one of the bridge spans of the new structure.

The model scenarios have been simplified in the ICM model with only the baseline model and two option models being provided. The option scenarios have been renamed Option 1 and Option 2 in ICM for simplicity.

- Option 1 – Allerdene Embankment Option
- Option 2 – Allerdene Viaduct Option

Figure 7 shows the baseline configuration / model schematisation.

# TECHNICAL NOTE

| | | | |
|---|---|---|---|
| **DATE:** | 28 January 2020 | **CONFIDENTIALITY:** | Public |
| **SUBJECT:** | Flood Modelling Response to EA Comments | | |
| **PROJECT:** | A1 BCH | **AUTHOR:** | Chris Parker |
| **CHECKED:** | | **APPROVED:** | Andy Smith |

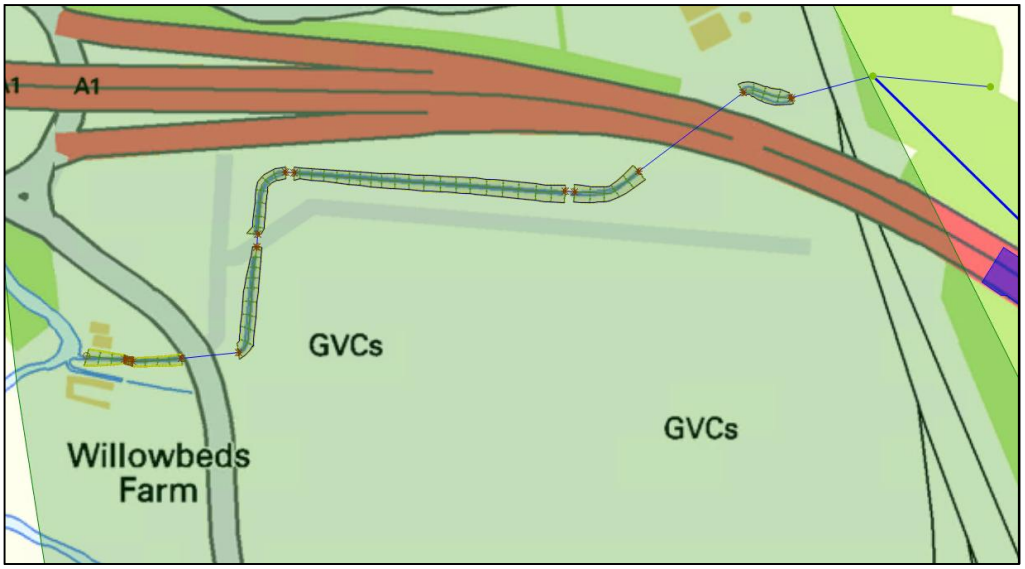



*Figure 7: Existing model channel configuration*

**Option 1**: requires the extension of the existing Allerdene culvert and realignment of the drainage channel. The proposed drainage channel includes the replacement of four culverts, these are to be replaced with, a 1200mm diameter circular culvert at the downstream end of the channel and a 1350mm and two 1200mm circular culvert at intervals along the channel. In addition, a 900mm diameter circular orifice plate at the upstream end of the existing culvert. These are designed to mimic the existing channel structure, which has three 1350mm culverts, to attenuate peak flows and maximise the available channel storage. The locations and sizes of the flow control structures are shown in Figure 8.

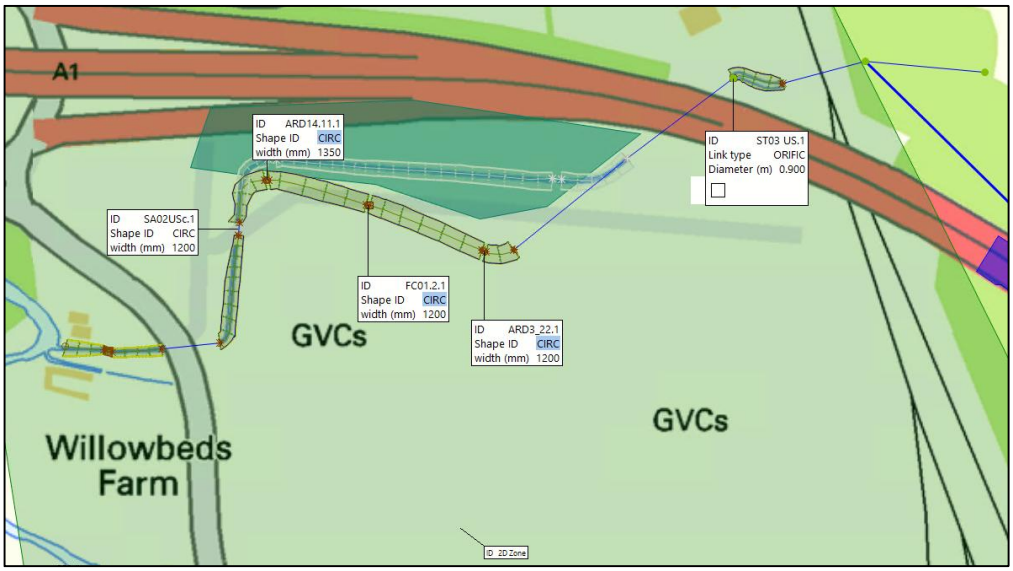



*Figure 8: Option 1 channel alignment and flow control locations*

**Option 2**: Requires the daylighting and replacement of Allerdene culvert with a new section of open channel and realignment of the existing channel to accommodate the construction of a new viaduct over the adjacent railway line. Like Option 1 the new drainage channel includes four 1200mm diameter circular flow control culverts, one at the downstream end and three at intervals along the new channel to attenuate peak flows. Figure 9 shows the alignment of the new channel and location of the flow control culverts.

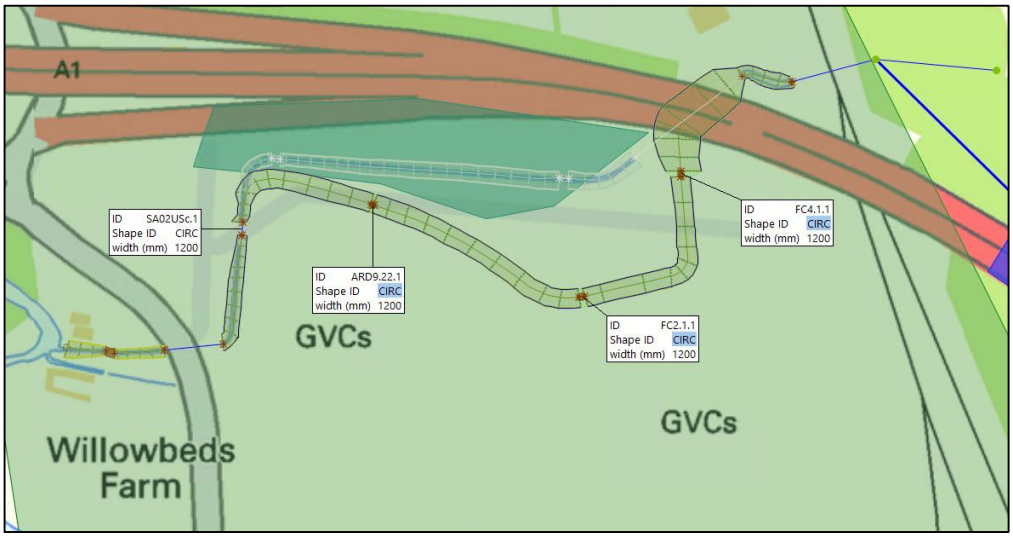



*Figure 9: Option 1 channel alignment and flow control locations*

### ID: B-14 PROVISION OF DIGITAL TERRAIN MODELS

Digital terrain models of the existing model and two options have been provided.

### ID: B-31 WATERCOURSE BANK LINES (EXISTING MODEL)

For the existing model the banklines were interpolated between survey sections, as the existing channel (for most of its length) is a uniform shape. At the time of survey, the channel was mainly within dense scrub and woodland therefore there is low confidence in the Lidar data which is one of the main reasons for using interpolation of survey data.

### ID: B-42 REPRESENTATION OF ROADS AND BUILDINGS

The Allerdene model covers a small area and this level of detail is not required in this instance.

### ID: B46 & B47 WATERCOURSE CONVEYANCE (OPTION MODELS)

For the option models the watercourse cross sections have been trimmed to top of banks at the sections identified and panel markers added to improve conveyance at higher flows.

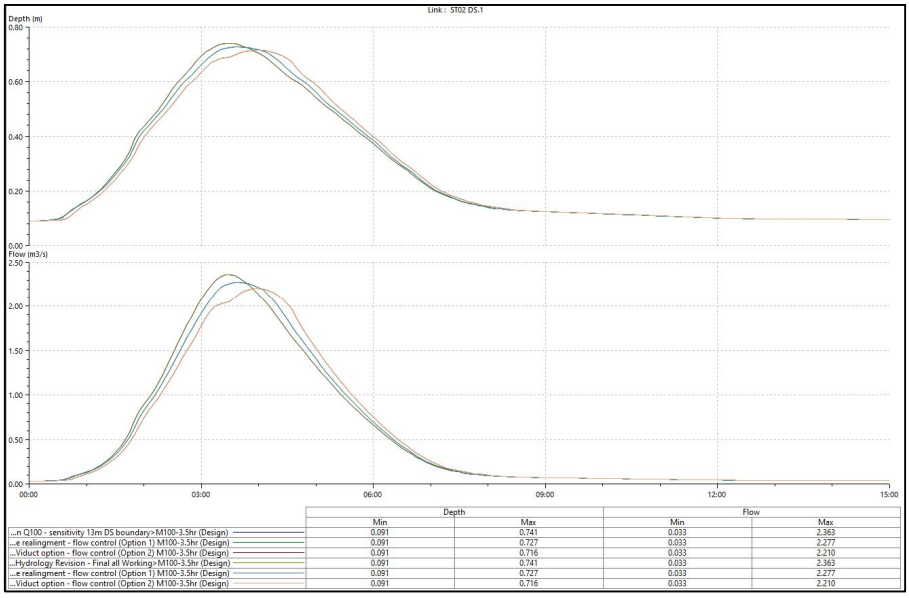
# TECHNICAL NOTE

| | | | |
|---|---|---|---|
| **DATE:** | 28 January 2020 | **CONFIDENTIALITY:** | Public |
| **SUBJECT:** | Flood Modelling Response to EA Comments | | |
| **PROJECT:** | A1 BCH | **AUTHOR:** | Chris Parker |
| **CHECKED:** | | **APPROVED:** | Andy Smith |

## ID: B145 & B152 SENSITIVITY TESTING

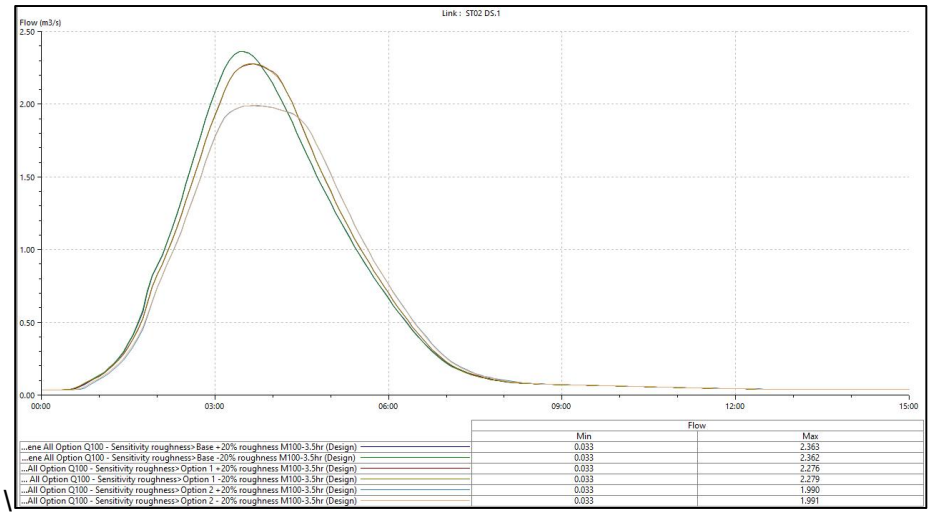
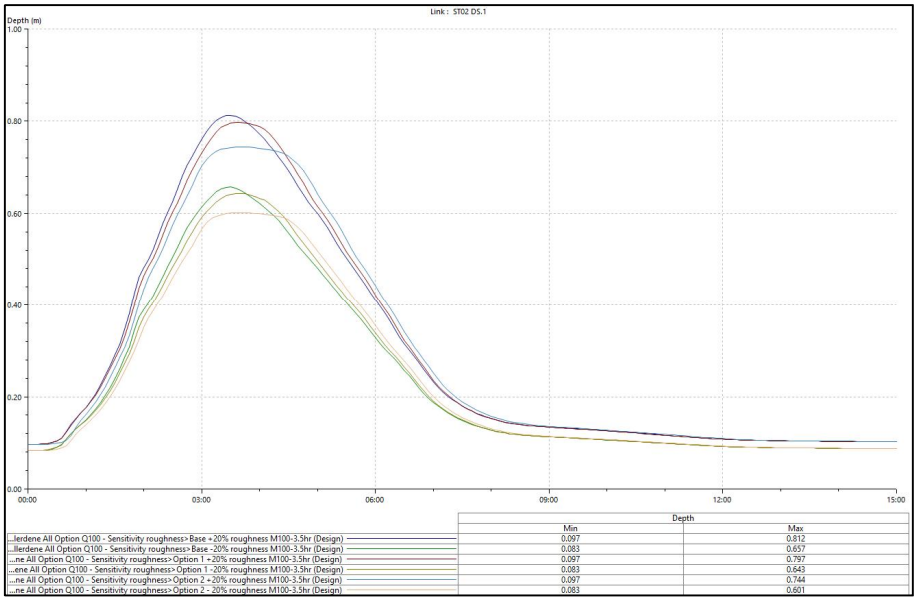
Sensitivity testing has been undertaken on the Allerdene Burn for the downstream boundary, the channel roughness and flow duration, these are summarised in Table 10.

*Table 10: Sensitivity Analysis for the Allerdene Burn*

| Sensitivity Test | Model changes | Description of sensitivity test and outcome |
|---|---|---|
| **Downstream Boundary** | Set downstream boundary to 13m AOD | The original downstream boundary was taken from the River Team model for the matching critical duration for the closest cross section to the confluence with the Allerdene Burn. To test the impact of the downstream boundary on the model a boundary level of 13m AOD has been applied. The River Team model demonstrates that this is approximately the highest level predicted for the 1 in 1000 year critical duration event at the confluence with the Allerdene Burn.<br><br>Results indicate that an extreme downstream boundary has no impact on the 1 in 100 year flows or depths. Figure 10 shows peak flows and depth for the 1 in 100 year event at the river reach ST02 DS.1. As there is negligible difference between the design and boundary test runs, the test run results mirror the design run, hence no impact and thus it is not visible.<br>  <br><br>*Figure 10: Flow hydrographs (top) and water depth (bottom) at river reach ST02 DS.1 for 1 in 100 year flows.* |

# TECHNICAL NOTE

| | | | |
|---|---|---|---|
| **DATE:** | 28 January 2020 | **CONFIDENTIALITY:** | Public |
| **SUBJECT:** | Flood Modelling Response to EA Comments | | |
| **PROJECT:** | A1 BCH | **AUTHOR:** | Chris Parker |
| **CHECKED:** | | **APPROVED:** | Andy Smith |

| | | |
|---|---|---|
| **Channel Roughness** | Channel Roughness Mannings +/- 20% | Increasing channel roughness by ±20% has no impact on peak flows (Figure 10). However, for channel depths it does cause the maximum depth to vary by approximately 140-150mm (Figure 11) or approximate ±70-80mm compared with the baseline roughness values. This is considered to be within the acceptable model tolerance limits.<br><br>  <br><br>\<br>*Figure 11: Flow hydrographs at river reach ST02 DS.1 for 1 in 100 year flows with varying roughness*<br><br>  <br><br>*Figure 12: Water depth at river reach ST02 DS.1 for 1 in 100 year flows with varying roughness.* |

| | | |
|---|---|---|
| **Flow duration** | Run 1 in 100 year 2.5 and 8.5 hour duration flows | Flows for the 1 in 100 year 2.5 hour and 8.5 hour duration where run to test the model sensitivity to different length flood events (Figure 13). Results show that the highest flow is achieved for the 3.5 hour duration flow hydrograph which was used as the critical design event. |

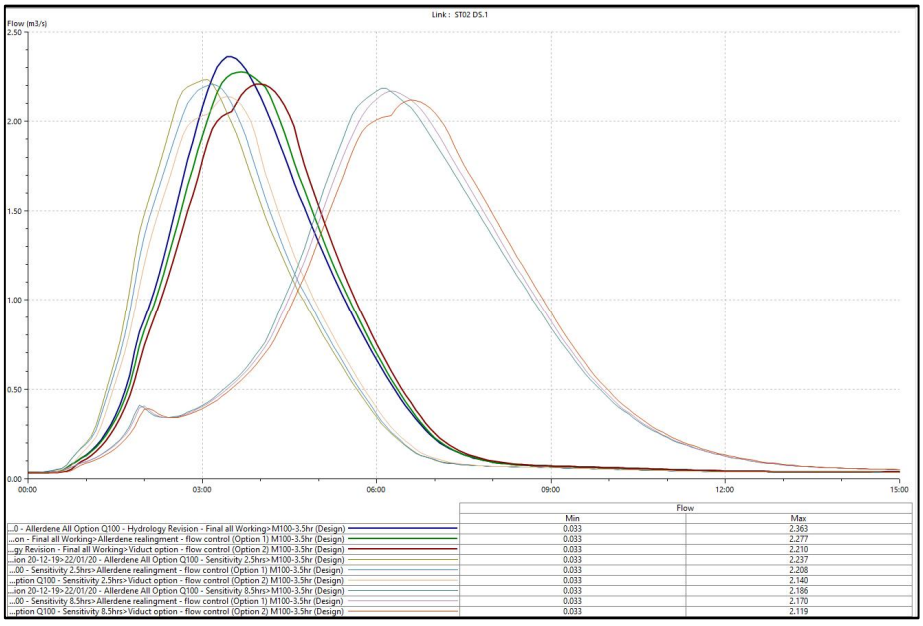



*Figure 13: Flow hydrographs at river reach ST02 DS.1 for 1 in 100 year flows for 2.5, 3.5 (**shown in bold**) and 8.5 hour durations.*

**ID: B-153 MODEL PERFORMANCE TESTS**

As the Allerdene burn is a minor watercourse with no available event data for calibration. The model performs well for all flow conditions modelled including the extreme 1 in 1000 year and 1 in 100 +50% climate change allowance.

| Technical Model Review Report | | |
|---|---|---|
| Client | Environment Agency | |
| Single project or WEM package? | WEM Package | |
| Package name (if applicable) | 2018-19 National Modelling and Forecasting Technical Support Contract | |
| Project name | Review No. 57 - A1 Birtley to Coal House | |
| JBA Project Number (or overarching project) | 2018s0387 | |
| JBA Sub-Project Number (if applicable) | 57 | |
| Review requirements | A) Previous project - hydrology | |
| | B) Previous project - hydraulic | |
| | C) New project - hydrology | Yes |
| | D) New project - hydraulics | Yes |
| | E) Survey data | |
| | F) Reporting | |

| "RAG" key | |
|---|---|
| Major issue | Omission that could make the findings subject to challenge and which requires correction/further work. |
| Minor issue | Non-standard method or method not following guidance but unlikely to have impacted on results |
| Clarification required | The approach used is unclear and requires further clarification before it can be reviewed |
| Recommendations | Suggestion for improved / good practice but which is unlikely to change the project outcomes. |
| Acceptable (but does not meet best practice) | The approach is acceptable, however it is not in line with standard industry best practice |
| Acceptable | Suggestion for improved / good practice but which is unlikely to change the project outcomes. |

## Summary of 1st hydrology review findings

**Hydrology review**

A few suggestions have been given below, which may give more conservative results. The reporting in Appendix A regarding the inflow calculations would benefit from additional detail , but is generally well written. The maps provided are excellent and are very helpful.

There are a few omissions that should be addressed, see individual comments below.

## Summary of 1st hydraulics review findings

**Allerdene Burn model:**

Minor issues have been identified. Generally the baseline model and option 1 are well constructed. There were some issues identified in Option 2 that could be impacting the results. Therefore it is recommended that this model is revised.

As for all modelling studies, results of the sensitivity testing and model proving, should be provided for review.

**Kingsway Viaduct model:**

As the baseline model was constructed by JBA, only the described changes at the viaduct have been reviewed to avoid a conflict of interest. The representation of the existing and proposed viaduct has been done well. However, the stability of out of bank flows in the area of interest is a concern in the 0.1% AEP event, proposed scenario examined.

| A | Hydrology Review |
|---|---|
| Date of hydrology analysis | Dec-18 |
| Name of reviewer | James Molloy BE(Hons) MEngSc |
| Date of review | 08/07/2019 |
| Revision | V1 |
| Applicable standards or guidance | Flood Estimation Handbook (IH, 1999) updates including Kjeldsen (DEFRA, 2008), and recent outputs from the FEH Local project |
| | ReFH1 and/or ReFH2 guidance documents |
| | EA Flood Estimation Guidelines (Operational instruction 197_08, V6) |
| Nature of study watercourse(s)/constraints | The study looks at various sources of flood risk along a reach of the A1 road, to the south of Allerdene near Newcastle. Various proposed engineering works along the road require an assessment of (a) fluvial flood risk from Allerdene Burn, a small tributary of the River Team and (b) surface water flood risk around Longacre Dean a short distance to the south-east.<br><br>**The report also looks at flood risk from the River Team, however as no changes have been applied to the hydrology used in the underlying model for this watercourse (previously signed off by the Environment Agency), this aspect is not reviewed in this document.** |
| Study objectives | The aim of the analysis is to determine if the proposed changes to the road layout have any effect on local flood risk. Information provided in Appendix A of the provided modelling report is used as the basis of this review. |
| Summary of 1st review | A few suggestions have been given below, which may give more conservative results. The reporting in Appendix A regarding the inflow calculations would benefit from additional detail , but is generally well written. The maps provided are excellent and are very helpful.<br>There are a few omissions that should be addressed, see individual comments below. |

| Category | Detail | ID | 1st review | | | |
|---|---|---|---|---|---|---|
| | | | Comment | Suitability | Suggested actions | Consultants Response (if required) |
| **General comments** | | | | | | |
| General comments | Method statement | A-1 | Quite detailed in places, as various sources of flood risk need to be considered in the analysis. The maps provided alongside the report are very useful and clear.<br><br>Some of the details regarding the hydrological inflows are quite sparse however, see individual comments below. | Clarification required | Reasoning is given in the main report text (Chapter 3) for the study requirements at each watercourse crossing of the A1 road. It seems an unusual decision why fluvial modelling was carried out on Allerdene Burn, but only pluvial modelling around Longacre Dean (why not carry out fluvial modelling at the latter site also?) | |
| | Previous studies | A-2 | It is understood that there are no previous studies looking at flood risk for Allerdene Burn, and that only broad-scale pluvial mapping has been carried out in the region surrounding Longacre Dean, which the authors correctly point out does not account for local drainage features that would affect local flood risk. | Acceptable | | |
| | Catchment description (any unusual features such as pumps, reservoirs, heavy urbanisation?) | A-3 | Small catchments, some of which drain densely urbanised areas. | Recommendations | Has the Urban ReFH2 method been considered adequately? Checked in further detail below. | |
| **Method statement** | | | | | | |
| Flow estimation points and descriptors | Location of FEPs / catchment descriptors provided? | A-4 | Yes in Section 3.3. | Acceptable | | |
| | Unusual catchment features (which may influence choice of approach) | A-5 | The Allerdene catchment is heavily urbanised, and also has a moderately high BFIHOST, noted by the authors. | Recommendations | It may also be useful to obtain sewer drainage information for the area around the Allerdene Burn catchment, in case there are sewered areas outside the topographic catchment draining into this watercourse. However, this is unlikely given the steep slope in the urban area, but still would be a useful to check. | |
| | Checks on catchment descriptors | A-6 | The catchment area has been correctly checked using LIDAR data, noted that this gives a larger area compared to the "default" FEH catchment. | Major issue | No further reporting given on how the change in catchment area influences other key catchment descriptors. DPLBAR should increase, and there could be significant changes to URBEXT2000 from the change in catchment boundary. Both of these need to be altered, and could have a big effect on calculated flows. | |
| Data review | Hiflows-UK version | A-7 | NRFA V7 is the latest version | Recommendations | Should be used in FEH statistical as an independent check on ReFH2, see below. | |
| | Review of hydrometric data | A-8 | No local hydrometric data available to calibrate hydrological methods unfortunately. | Acceptable | | |
| | Rating reviews | A-9 | n/a, no local gauges in the area apart from on the River Team, not reviewed here. | Acceptable | | |
| | Flood history | A-10 | Yes, the authors have queried data held by the Environment Agency and briefly reported this in Chapter 4 of the main report, giving some details of recent floods. This shows that the region assessed here is vulnerable to a range of flood mechanisms. | Acceptable - but does not meet best practice | There are other useful sources of flood history as well. I would recommend having a look on the CBHE website (http://www.cbhe.hydrology.org.uk/index.php), and a general internet search also. | |
| Initial choice of methods | Approaches suggested | A-11 | Only the ReFH2 method is proposed for use for the Allerdene modelling. Depending on the software implementation used, urbanisation adjustments may/may not have been automatically applied given the very high URBEXT200 values. | Major issue | Confirm whether or not the ICM implementation of ReFH2 automatically applies the urban adjustment, giving faster response times and peak flows on highly urbanised catchments.<br><br>There is no mention anywhere in the document of the FEH statistical method, which should also be applied here, given the uncertainty from catchment-descriptor methods. This at least would be useful as ball-park check on the peak flow produced from ReFH2. | |
| | Justification of approach | A-12 | A sensible argument is given for using FEH99 rainfalls over FEH13 (although it's hidden in a footnote!), given that the former is reported to give higher rainfall totals in this case. For the purposes of construction options modelling this is a good idea. Some data needs to be presented in the Appendix however to back this up, perhaps a table comparing rainfall totals across multiple storm durations.<br><br>However using FEH99 rainfall in the ReFH2 model may have an unforeseen drawback. In this situation with FEH99 rainfall, ReFH2 applies the "alpha" factor when calculating runoff (essentially a fudge factor that reduces runoff for increasing return periods - introduced to try to match FEH statistical peaks, but conceptually does not make a lot of sense!). So even though FEH99 might give more rainfall, the "alpha" factor may cancel out the effect. This factor is not used with FEH13 rainfall in the model. | Major issue | Add a table comparing FEH99 and FEH13 rainfalls to back up the argument given in Chapter 2 of Appendix A.<br><br>Run the ReFH2 model for the 100 and 1,000yr events with the FEH13 rainfall also, to test if this gives larger peak flows, due to the "alpha" issue discussed to the left. | |
| | Lumped / distributed | A-13 | n/a, as a single inflow to the model is sufficient for this case for the Allerdene model. | Acceptable | | |
| | | A-14 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Flow estimation** | | | | | | |
| FEH Statistical | Suitable for statistical? | A-15 | Yes, as a check on ReFH2 results, but not used, see above. | Major issue | See above | |
| | QMED estimation - CDs | A-16 | | | | |
| | QMED estimation - AMAX / POT | A-17 | | | | |
| | Choice of donors | A-18 | | | | |
| | Growth curve methodology | A-19 | | | | |
| | Hydrology shape | A-20 | | | | |
| ReFH method | Suitable for ReFH? | A-21 | Yes with caution given the heavy urbanisation | Acceptable | | |
| | Calibration | A-22 | n/a, the small catchment assessed here is ungauged. | Acceptable | | |
| | Choice of design storm | A-23 | Summer rainstorm profile is suitable in this case. However only very little discussion given for the choice of design storm duration, choosing the value used in the existing River Team model, simply assuming this will also be critical for Allerdene Burn. | Major issue | Run the ReFH2 model for a range of storm durations to see which gives the largest peak flows for Allerdene Burn. Assuming the same critical storm duration as the downstream River Team model could under-estimate peak flows on this small and fast-responding stream, especially important when testing models needed to size culverts, bridges, etc (in this case I think it's OK to mix and match durations from the main Team model and the Allerdene model, to give conservative results). Give a table of peak flows from ReFH2 versus storm duration in the text. | |
| Urban ReFH variant | Suitable for urban ReFH? | A-24 | Yes, see previous comments | Major issue | Clarify in the text if the ICM implementation applies the urban adjustments from ReFH2. | |
| | Catchment delineation | A-25 | n/a, a lumped approach is OK here. | Acceptable | | |
| | Calibration | A-26 | n/a, no gauges available to calibrate the ReFH2 model on these small streams. | | | |
| | Choice of URBEXT values | A-27 | See comments above | Major issue | See adjustments for URBEXT200 required above. | |
| | Choice of percentage runoff | A-28 | ReFH2 defaults are presumably applied for the Allerdene Burn model, this should be OK (but should be reported, e.g. was urbanised %runoff left at the default 70%?) | Acceptable | | |
| Final choice of method | Final flows | A-29 | N/A as only one method used. Given reliance on (uncertain) catchment descriptor methods, it is important to look at both FEH statistical and ReFH2. | Recommendations | | |
| **Miscellaneous** | | | | | | |
| | Direct rainfall modelling - 2D domain extent | A-30 | The model domain for the direct-rainfall modelling around Longacre Dene looks sensible, based on LIDAR. The plot in Table 6 in Appendix A is very useful to demonstrate this. | Acceptable | | |
| | Direct rainfall modelling - 2D downstream boundary condition | A-31 | The authors state that there was no need to apply a 2D downstream boundary condition to remove excess ponding at the southern edge of the model. | Minor issue | It is usually best practice to place a downstream boundary on a direct rainfall model, to stop any glasswallng affecting results. This might be more important if longer rainstorms are being tested. | |
| | Direct rainfall modelling - range of storm durations tested | A-32 | There is no information given on the range of storm durations used in this direct rainfall modelling in the report. The EA national-scale pluvial mapping runs separate models for storm durations of 1hr, 3hrs and 6hrs, then merges the modelled maximum depths in a final grid. This allows for runoff rates on regions with different topography to influence the results. A similar method needs to be adopted for this more detailed assessment. | Major issue | Run the direct rainfall model for a range of storm durations, then merge the results taking the maximum from each individual model grid. | |
| | Direct rainfall modelling - Percentage runoff | A-33 | Not much detail given on this, other than use of the ReFH rainfall. Not clear from the text if this is before or after application of the ReFH2 loss model (i.e., is gross or net rainfall used)? Another issue is the use of different percentage runoff on different parts of the model. Has base mapping been used to inform where percentage runoff should be increased on urban surfaces? This is typically set at 70% but can be altered in some cases, with the ReFH model used to inform %runoff on other surfaces. | Major issue | See list of issues to the left. | |
| Climate change | Consistent with latest guidance? | A-34 | The text in Section 3.3.4 of Appendix A suggests an unusual method was used to apply climate change allowances, altering the rainfall applied to ReFH2. As the Allerdene part of the study is a fluvial analysis, it is standard practice to simply multiply the final fluvial hydrographs by the percentage increase. | Minor issue | (Minor issue) For climate change runs on the Allerdene catchment, recommend instead simply multiplying the initial flow hydrographs using the fluvial uplift factors, instead of altering the input rainfall to ReFH2. As the results of this unusual method are not too far off the required percentages, this is a minor issue only. However this complicated method is needed for applying climate change uplifts for the pluvial analysis (the ReFH loss model is non-linear).<br><br>(comment for EA) The EA also had a query on use of UKCP18 outputs instead of UKCP09 for climate change analysis. While some UKCP18 outputs are now available, research is ongoing to convert these large datasets to simple uplift factors for fluvial / rainfall inputs, due to be released later this year by CEH. Data from UKCP18 can be used manually to inform updated uplift factors, but current guidance recommends this is only needed on very high-risk areas (e.g. power stations). Therefore the use of uplift factors from the current EA guidance (2016 document) using UKCP09 is suitable in this case. (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) | |
| **Reporting and follow up actions** | | | | | | |
| Reporting and Results. | Suitability of reporting | A-35 | Quite detailed in places, but lacking detail in others, see the list above. The maps given alongside the report are very well put together and are very helpful. | Minor issue | | |
| | Results | A-36 | Some issues and omissions spotted, as listed above. | Major issue | See above | |
| | Recommendations | A-37 | Key recommendations as follows:<br>- Consider if fluvial modelling on Longacre Dene is needed as well as general pluvial modelling?<br>- Carry out FEH statistical method as an independent ball-park check on the ReFH2 fluvial calculations<br>- Consider sensitivity of using FEH13 rainfall due the "alpha" issue discussed above<br>- Look at sensitivity of results to storm duration, for both fluvial and pluvial analysis. | Major issue | See above | |

| B | Review of River Team Viaduct |
|---|---|
| Date of model | August 2018 |
| Name of reviewer | Jenny Hill |
| Date of review | 24/07/2019 |
| Revision | v2 |
| Applicable standards or guidance | |
| Nature of study watercourse(s)/constraints | Allerdene Burn |
| Study objectives | The reporting states:<br>Flood Risk Assessment (FRA) to support the Environmental Impact Assessment (EIA) and DCO Application for the A1 Birtley to Coal House Scheme. Three areas were identified for further modelling:<br>- Hydraulic modelling to the River Team at Junction 67 to assess the impact of the extension of the Kingsway Viaduct. This modelling utilises an existing Environment Agency hydraulic model of the River Team constructed by JBA in 2014.<br>- Hydraulic modelling of the Allerdene Burn to understand the impact of the A1 realignment which will require either:<br>a. the extension of the existing Allerdene culvert and replacement of the existing section of the Burn;<br>b. or daylighting of the existing culvert and replacement and realignment of the existing burn to accommodate a new viaduct over the existing railway line.<br>- Hydraulic modelling of the surface water flood risk at Junction 66.<br><br>**This review focusses on the River Team at Junction 67** |
| Summary of 1st review | As the baseline model was constructed by JBA, only the described changes at the viaduct have been reviewed to avoid a conflict of interest. The representation of the existing and proposed viaduct has been done well. However, the stability of out of bank flows in the area of interest is a concern in the 0.1% AEP event, proposed scenario examined. |

| Category | Detail | Prompts | ID | Comment | Suitability | Suggested actions |
|---|---|---|---|---|---|---|
| **Data to be reviewed** | | | | | | |
| Data to be reviewed | Software | ~ Versions | B-1 | InfoWorks ICM v6 | Acceptable | |
| | | | B-2 | Updated to v8 for the purpose of this review | Acceptable | |
| | AEPs provided / reviewed | | B-3 | 1% AEP + 20 or 40% and 0.1% AEP. | Acceptable | |
| | | | B-4 | 1% AEP event reviewed. | Acceptable | |
| | Scenarios provided / reviewed | | B-5 | Base and 'Kingsway Bridge Extension'. The Kingsway Bridge Extension scenario has been the focus of this review. | Acceptable | |
| | Reports | ~ Reference versions<br>~ Technical reporting<br>~ General reporting | B-6 | FRA report with technical appendices | Acceptable | |
| **Reporting** | | | | | | |
| Reporting | Reporting | ~ Objectives<br>~ Constraints<br>~ Approach Justification (both model scale and structure scale)<br>~ Clarity<br>~ Assumptions | B-8 | The report states that Modelling changes are confined to the A1 junction 67 roundabout 424950, 558550 and included the modelling of the existing Kingsway Viaduct and the proposed widening of the viaduct to include an additional pillar. | Acceptable | |
| | | | B-9 | Reporting generally clear and thorough | Acceptable | |
| | | | B-10 | Results discussed | Acceptable | |
| **General comments** | | | | | | |
| General comments | File organisation / naming convention | ~ Scenarios<br>~ Naming<br>~ Flags | B-12 | Flags ED and AD have been used at the changed structure, although flags have not been included in the model describe what this means. | Clarification required | In future include a CSV export of flags or a table of flags in the report |
| | | | B-13 | The viaduct option has been created as a scenario from the base model, which follows best practice. | Acceptable | |
| | | | B-14 | The scenario is clearly named which is helpful for future users. | Acceptable | |
| | Survey / topographic data | ~ Age<br>~ Quality | B-15 | Source of data is unknown as flag not included, although it is assumed that ED refers to Engineering Drawings. | Clarification required | |
| | Other | ~ Any significant missing data | B-16 | DTM was not provided although the commit history suggests a custom DTM which included topographic survey was used. | Clarification required | In future, provide the DTM used |
| **General modelling approach** | | | | | | |
| General modelling approach | Model extents | ~ Domain boundaries | B-18 | Domain is unchanged from the base model | Acceptable | |
| | Modelling approach | ~ 1D / 2D / Linked<br>~ georeferenced (xy/gxy/2d links) | B-19 | A 1D-2D approach has been used for the watercourse and a 2D representation of the viaduct pillars has been used. | Acceptable | |
| | | | B-20 | The model is fully geo-referenced. | Acceptable | |
| | Application of hydrological estimates | ~ Lumped / distributed | B-21 | The application of the hydrology is unchanged from the base model | Acceptable | |
| **InfoWorks ICM** | | | | | | |
| InfoWorks ICM | Model build | ~ Hard bed / soft bed<br>~ Accuracy of modelled channel length | B-23 | The model is an adapted version of the JBA built, Environment Agency approved model. The changes made to the existing model have been documented in the commit history. Changes listed are all in relation to Kingsway Viaduct. The 'compare network' tool has been run on the WSP and existing EA model. This concluded that WSP's description of the changes was accurate. | Acceptable | |
| | | | B-24 | The modelling report does not comment on whether hard or soft bed have been modelled. However, as the is a proposed design, it is assumed a hard bed level was implemented. | Acceptable | |
| | | | B-25 | The modelled length has been calculated from the centre line and the centre line matches the mapped watercourse well. | Acceptable | |
| | | | B-26 | 1D river reaches have been voided from the 2D zone to avoid double counting | Acceptable | |
| | Watercourses | ~ Deactivation<br>~ Interpolates<br>~ Bank level and DTM matchup<br>~ Bank coefficients<br>~ Baseflow | B-27 | Based on the cross section naming convention, it is not thought that any interpolates have been applied. The resolution of cross sections in the study area mean no interpolates were necessary. | Acceptable | |
| | | | B-28 | Discharge coefficient of 1 and modular limit of 0.9 consistently used. | Acceptable | |
| | | | B-29 | The 1D river banks generally track the DTM level well. However, at chainage 50m on river reach TEAM_5156.1 the 1D bank is 1m higher than the 2D level. The 0.1% AEP water level predicted to exceed bank tops so this has potential to impact the results. | Minor issue | Modify 1D or 2D water levels to allow a better match of levels in area of interest |
| | | | B-30 | River sections look sensible but few panel markers have been used. | Acceptable | |
| | | | B-31 | Conveyance plots for TE05365 and TE05340 are kinked at higher depths. | Minor issue | Update panel markers and channel roughness to smooth conveyance plots at deeper flows. |
| | Watercourse structures | ~ Bridges<br>~ Culverts<br>~ Screens<br>~ Weirs<br>~ Flap valves<br>~ Sluices | B-32 | 25 mesh zones have been used to represent viaduct pillars in the flood plain | Acceptable | |
| | | | B-33 | In the proposed scenario, all the pillars use a level of 20mAOD. This is 7.5m above ground level which seems appropriate. In the base scenario, the proposed pillars are included but with a level change of 0m. | Acceptable | |
| | | | B-34 | Notes have been used to describe which pillars are existing and which are proposed, which is helpful. | Acceptable | |
| | Mesh | ~ Mesh optimisation<br>~ Infiltration surfaces<br>~ Initial conditions<br>~ Rainfall applied to the mesh. Use of sub catchments<br>~ 1D/2D linking: bank lines, manhole flood types, inline banks | B-35 | The use of mesh zones with small footprints is causing the generation of small triangles (Figure 1) around the area of interest which could slow model run times. | Minor issue | In future models, simplify the geometry of 2D features (while retaining area) to avoid small triangles. |
| | Mesh modifications | ~ Representation of roads and buildings | B-36 | See watercourse structures above | Acceptable | |
| | Scenarios | ~ Do minimum (baseline)<br>~ Do nothing<br>~ Do something | B-38 | As the baseline model was constructed by JBA, only the described changes at the viaduct have been reviewed to avoid a conflict of interest. | Acceptable | |
| | | | B-39 | Only Kingsway Bridge Extension scenario has been reviewed. | Acceptable | |
| | Run parameters and output data | ~ Results generated<br>~ Temporal resolution of results<br>~ Run parameters | B-40 | Results are saved every 5 minutes. | Acceptable | |
| | | | B-41 | Timestep used was 4 seconds | Acceptable | |
| | | | B-42 | Simulation was run for 30-hours which allows the full storm to pass in the area of interest. | Acceptable | |
| **Runs** | | | | | | |
| | Model simulations | Model simulation runs<br>~ Existing (baseline)<br>~ Climate change<br>~ Sensitivity | B-136 | Sims provided for the base and scenario for the 1, 1 +20 or 40% and 0.1% AEP events. | Acceptable | |
| | | | B-137 | No sensitivity tests were provided. | Minor issue | Run sensitivity tests |
| **Model results, interpretation, verification and stability** | | | | | | |
| Model results, interpretation, verification and stability | Model stability | ~ zzd, eof, tlf<br>~ Model warnings and errors<br>~ Non-convergence<br>~ Mass balance<br>~ unrealistic oscillations (water level / flow / boundaries / dVol). | B-139 | The base 0.1% AEP event ended incomplete. | Minor issue | |
| | | | B-140 | Total mass error = 9.9 m3 | Acceptable | |
| | | | B-141 | Volume balance error = 0.9 % | Acceptable | |
| | | | B-142 | There is some oscillation in the peak flows in the area of interest during a 0.1% AEP event (Figure 2) | Minor issue | Make updates to conveyance and bank lines to improve stability |
| | | | B-143 | There is some significant oscillations in the out of bank flows in the area of interest during the 0.1% AEP event (figure 3) | Major issue | Make updates to conveyance and bank lines to improve stability. If appropriate, lower bank co-efficient |
| | Sensitivity testing | ~ Suitability of sensitivity testing undertaken<br>~ Results & interpretation of sensitivity testing | B-144 | Sensitivity tests not provided for review | Minor issue | Run sensitivity tests |
| | Calibration / performance | | B-145 | No model performance testing was provided for review. | Minor issue | Use the model report to provide commentary on the sensibility of predicted flooding. |

Figure 1: Small triangles around pillars

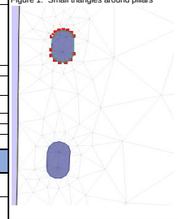


Figure 2: In channel flows ate TEAM 5156.1

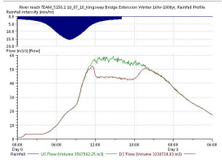
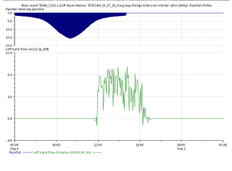


Figure 3: : Left bank flows at TEAM 5156.1



| |
|---|
| Acceptable |
| Acceptable - but does not meet best practice |
| Clarification required |
| Minor issue |
| Major issue |
| Recommendations |

| B | Review of Alledene Burn |
|---|---|
| Date of model | August 2018 |
| Name of reviewer | Jenny Hill |
| Date of review | 19/07/2019 |
| Revision | v1 |
| Applicable standards or guidance | |
| Nature of study watercourse(s)/constraints | Alledene Burn |
| Study objectives | The reporting states:<br>Flood Risk Assessment (FRA) to support the Environmental Impact Assessment (EIA) and DCO Application for the A1 Birtley to Coal House Scheme. Three areas were identified for further modelling:<br>- Hydraulic modelling to the River Team at Junction 67 to assess the impact of the extension of the Kingsway Viaduct. This modelling utilises an existing Environment Agency hydraulic model of the River Team constructed by JBA in 2014.<br>- Hydraulic modelling of the Alledene Burn to understand the impact of the A1 realignment which will require either:<br>a. the extension of the existing Alledene culvert and replacement of the existing section of the Burn;<br>b. or daylighting of the existing culvert and replacement and realignment of the existing burn to accommodate a new viaduct over the existing railway line.<br>- Hydraulic modelling of the surface water flood risk at Junction 66.<br><br>**This review focusses on the *Alledene* Burn options** |
| Summary of 1st review | Minor issues have been identified. Generally the baseline model and option 1 are well constructed. There were some issues identified in Option 2 that could be impacting the results. Therefore it is recommended that this model is revised.<br>As for all modelling studies, results of the sensitivity testing and model proving, should be provided for review. |

| Category | Detail | Prompts | ID | Comment | Suitability | Suggested actions |
|---|---|---|---|---|---|---|
| **Data to be reviewed** | | | | | | |
| Data to be reviewed | Software | ~ Versions | B-1 | InfoWorks ICM v6 | Acceptable | |
| | AEPs provided / reviewed | | B-2 | 0.1% AEP model files and results | Acceptable | |
| | Scenarios provided / reviewed | | B-3 | Base, Option 1 ditch realignment, Option 1 realignment flow control, Option 2 and Option 3 | Acceptable | |
| | Reports | ~ Reference versions<br>~ Technical reporting<br>~ General reporting | B-4 | FRA report with technical appendices | Acceptable | |
| **Reporting** | | | | | | |
| Reporting | Reporting | ~ Objectives<br>~ Constraints<br>~ Approach Justification (both model scale and structure scale)<br>~ Clarity<br>~ Assumptions | B-6 | Objectives clearly stated in the reporting | Acceptable | |
| | | | B-7 | Reporting generally clear and thorough | Acceptable | |
| | | | B-8 | The scenarios are a bit unclear - more models provided than options discussed. | Clarification required | Check consistency between model and reporting provided for review. |
| | | | B-9 | Results discussed | Acceptable | |
| **General comments** | | | | | | |
| General comments | File organisation / naming convention | ~ Scenarios<br>~ Naming<br>~ Flags | B-11 | Scenarios and files well labelled although it was a bit confusing to establish what is the base scenario. One model network with all options as scenarios could have been a neater way to organise the options. | Acceptable - but does not meet best practice | In future, use one model network with a series of scenarios to represents options |
| | | | B-12 | Flags have not been included although data has been flagged. | Acceptable - but does not meet best practice | In future include a CSV export of flags or a table of flags in the report |
| | | | B-13 | Naming conventions are clear and descriptive | Acceptable | |
| | | | B-14 | The DTM has not been provided which makes comparisons more difficult. A lidar clip has been made but it understood that the model DTM was a composite of three sources | Clarification required | In future, provide the DTM used |
| | Survey / topographic data | ~ Age<br>~ Quality<br>~ Suitability | B-15 | According to the report, Channel survey for Alledene Culvert was undertaken by Longdin and Browning in March 2018 | Acceptable | |
| | | | B-16 | Lidar data was supplemented by topo survey in the study area. | Acceptable | |
| | Other | ~ Any significant missing data | B-17 | NextMap 5m has been used to north east of the A1 which has partial or no Lidar coverage. | Acceptable | |
| **General modelling approach** | | | | | | |
| General modelling approach | Model extents | ~ Domain boundaries<br>~ Upstream/downstream boundaries<br>~ Potential downstream influences on water levels<br>~ Glass walling | B-19 | The Alledene Burn is not mapped. However, a check against 1m Lidar suggests that the full length of the watercourse has been modelled in 1D with 2D linking. | Acceptable | |
| | | | B-20 | A check on the maximum flood extent for the 0.1% AEP event showed no glass walling. Therefore the extent of the 2D model is considered appropriated. | Acceptable | |
| | Modelling approach | ~ 1D / 2D / Linked<br>~ georeferenced (xy/gxy/2d links) | B-21 | 1D river reaches are linked to the 2D domain at banks. | Acceptable | |
| | | | B-22 | Model is fully georeferenced | Acceptable | |
| | Application of hydrological estimates | ~ Lumped / distributed<br>~ Applied to 1D or 2D domain<br>~ Lateral or point inflows<br>~ Consistency with reporting | B-23 | Inflows have been applied at the upstream extent of the model | Acceptable | |
| | | | B-24 | No lateral inflows are made, but it is not anticipated that these would be required for a watercourse of this size. | Acceptable | |
| | | | B-25 | A downstream water level from the River Team for the same AEP has bee applied. | Acceptable | |
| **InfoWorks ICM** | | | | | | |
| InfoWorks ICM | Model build | ~ Hard bed / soft bed<br>~ Accuracy of modelled channel length | B-27 | Hard bed/ soft bed not specified in the reporting | Clarification required | Specify if hard or soft bed levels were used.. |
| | | | B-28 | All river reach lengths have been calculated based on the length of the centre line and the centreline follows the channel indicated in the DTM well. | Acceptable | |
| | Watercourses | ~ Deactivation<br>~ Interpolates<br>~ Bank level and DTM matchup<br>~ Bank coefficients<br>~ Baseflow | B-29 | 1D river reaches have been voided from the 2D zone to avoid double counting | Acceptable | |
| | | | B-30 | Interpolates have been used excessively, with on interpolate every 10m. The interpolates have not caused any kinks in the conveyance plots so it is concluded that this is unlikely to impact results. | Acceptable - but does not meet best practice | |
| | | | B-31 | Bank levels are interpolated between survey points rather than updated from the DTM. In some cases this can make the 1D bank 2m above the 2D level | Minor issue | In future, update bank levels from DTM in between surveyed cross sections if there is good confidence in the DTM levels. |
| | | | B-32 | Discharge coefficient of 1 and modular limit of 0.8 consistently used. | Acceptable | |
| | | | B-33 | No inflow applied to the river reach link as inflow hydrograph has been used. | Acceptable | |
| | Watercourse structures | ~ Bridges<br>~ Culverts<br>~ Screens<br>~ Weirs<br>~ Flap valves<br>~ Sluices | B-34 | 7 culverts have been modelled. The data flags suggested 6 of these 7 have been modelled from survey data and 1 from As Built drawings. The size and roughness looks sensible although I would recommend that Manning's n is used for fluvial culverts over Colebrook White. | Acceptable | |
| | | | B-35 | Culvert inlets and outlets consistently used with appropriate coefficients applied. | Acceptable | |
| | | | B-36 | 1 bridge has been modelled. The bridge opening (flagged as survey data) and deck look sensible compared to the river cross section. Bank coefficient and discharge coefficient have been left as default. | Acceptable | |
| | | | B-37 | Summary on none modelled: flap valve, orifice, pump, screen, weirs | Acceptable | |
| | Mesh | ~ Mesh optimisation<br>~ Infiltration surfaces<br>~ Initial conditions<br>~ Rainfall applied to the mesh. Use of sub catchments<br>~ 1D/2D linking: bank lines, manhole flood types, inline banks | B-38 | Max triangle area was 20m$^2$ and minimum element was 10m$^2$ which is appropriate for a model of this scale. The general roughness was 0.035 which is within typical range. | Acceptable | |
| | | | B-39 | No mesh warnings have were produced. | Acceptable | |
| | | | B-40 | No rainfall was applied to the mesh, despite rainfall being applied in the run set up. It is understood that this was a fluvial model, and therefore the rainfall was not required. However, clarification on why rainfall files have been included is required. | Clarification required | Clarify if rainfall was an intended inflow to this model. |
| | | | B-41 | 1D-2D linking happens at bank lines which has been successfully achieved. | Acceptable | |
| | Mesh modifications | ~ Representation of roads and buildings<br>~ Roughness | B-42 | There is no representation of the conveyance in highways or the resistance caused by buildings. | Minor issue | Represent buildings, road, woodland, scrub as roughness zones in the 2D model. |
| | | | B-43 | However, the raised highway embankment are represented in the DTM and therefore the mesh. | Acceptable | |
| | Scenarios | ~ Do minimum (baseline)<br>~ Do nothing<br>~ Do something | B-44 | Option 1a: Ditch re-alighment<br>A Mesh Level Zone has been added over the existing watercourse. This adjusts the DTM elevation to give a minimum elevation of 16 mAOD and maximum elevation of 17.5 mAOD. A 3D view indicates that this level zone has lowered the existing embankment. There has been no modification of the ground levels to tie in worth the proposed bank heights. In some locations this can cause a 1m discrepancy between 1D and 2D bank level. This is not shown to impact 0.1% AEP results.<br>The extended culvert has been connected to the proposed culvert with a break node. I would think it more likely that a manhole chamber would be installed to connect these. A manhole would have the potential to flood whereas a break node does not. However, the pipe is not surcharged at the peak of the 0.1% AEP event so this is not thought to impact results.<br>The roughness of the proposed culvert has not been updated from default. The<br>The new cross sections mainly look sensible but ARD1 - ARD4 all have left bank lower than the highest point, allowing for premature flooding (Figure 1). However, the max water level doesn't exceed left bank level in the 0.1% AEP event so this is not thought to impact results.<br>The conveyance of the new cross sections is kinked at higher depths (Figure 2). However, the max water depth doesn't reach this level in the 0.1% AEP event so this is not thought to impact results. | Acceptable - but does not meet best practice | |
| | | | B-45 | Option 1b: Ditch realignment + flow control<br>A Mesh Level Zone has been added over the existing watercourse, as before (for comments see Option 1a).<br>Pipe size of SA02USc.1 has been reduced from 1.35 to 1.2m in diameter. No other apparent changes made from Option 1a so same comments stand. | Acceptable - but does not meet best practice | |
| | | | B-46 | Option 2: Viaduct<br>A Mesh Level Zone has been added over the existing watercourse, as before (for comments see Option 1a).<br>There is no apparent level change in the model to account for lowering the highway embankment which is present in the DTM JBA imported (no DTM provided). As a result, in some places there is a 9m miss match between the 1D and 2D bank levels modelled. In channel water levels do not exceed bank top during the 0.1% AEP so this is not impacting results.<br>The open channel has been extended to replace the culvert.<br>As per Option 1a, sections ARD1-ARD4 have lower left bank to the bank top (Figure 1). The same is true for ARD14-17 and ST02 US. Here channel flow does exceed bank top in the 0.1% AEP event (Figure 4) so this is impacting results.<br>As per Option 1a, conveyance plots are kinked in at greater depths, which in this instance could impact the results as in channel depths exceed 1m. | Minor issue | Trim 1D cross sections to the highest point on the left bank. Update panel markers and channel roughness to smooth conveyance plots at deeper flows. |
| | | | B-47 | Option 3: Viaduct<br>There are no apparent changes between Options 2 and 3 so the same comments stand unless clarification of changes is provided. | Minor issue | Trim 1D cross sections to the highest point on the left bank. Update panel markers and channel roughness to smooth conveyance plots at deeper flows. |
| | Run parameters and output data | ~ Results generated<br>~ Temporal resolution of results<br>~ Run parameters | B-48 | Results saved at a 1minute interval which is high but acceptable. | Acceptable | |
| | | | B-49 | Model is run for 12 hours which allows the full storm to pass | Acceptable | |
| | | | B-50 | Run use a GPU card but don't link 1D and 2D calculations at minor timesteps. | Acceptable | |

Figure 1: Bank too higher than left bank

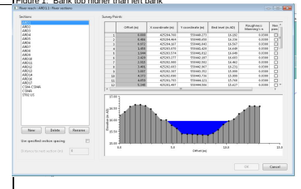


Figure 2: Kinked conveyance at higher depths

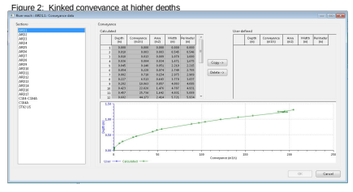


Figure 3: Bank level miss match

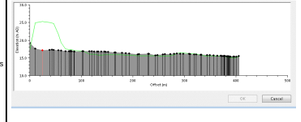
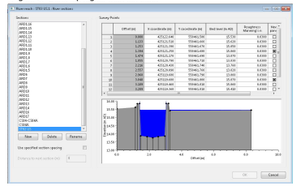


Figure 4: Bank top higher than left bank



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|---|---|---|---|---|---|---|
| **Runs** | | | | | | |
| | Model simulations | Model simulation runs<br>~ Existing (baseline)<br>~ Climate change<br>~ Sensitivity | B-144 | The model has been run and reviewed for the baseline and options. All results use the 0.1& AEP event. | Acceptable | |
| | | | B-145 | There were no sensitivity tests provided. | Minor issue | Run sensitivity tests |
| **Model results, interpretation, verification and stability** | | | | | | |
| Model results, interpretation, verification and stability | Model stability | ~ zzd, eof, tlf<br>~ Model warnings and errors<br>~ Non-convergence<br>~ Mass balance<br>~ unrealistic oscillations (water level / flow / boundaries / dVol). | B-147 | Total mass error = 0.0 m3 | Acceptable | |
| | | | B-148 | Volume balance error = 0.0 % | Acceptable | |
| | | | B-149 | In channel flows raise and fall in a smooth hydrograph | Acceptable | |
| | | | B-150 | Out of bank flows are generally stable | Acceptable | |
| | | | B-151 | There is some instability at the downstream boundary due to the backing up of the River Team 0.1% AEP level but this is not impacting the results in the area of interest. | Acceptable | |
| | Sensitivity testing | ~ Suitability of sensitivity testing undertaken<br>~ Results & interpretation of sensitivity testing | B-152 | Sensitivity tests not provided for review | Minor issue | Run sensitivity tests |
| | Calibration / performance | | B-153 | No model performance testing was provided for review. | Minor issue | Use the model report to provide commentary on the sensibility of predicted flooding. |

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|---|
| Acceptable |
| Acceptable - but does not meet best practice |
| Clarification required |
| Minor issue |
| Major issue |
| Recommendations |