AM2

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT GARDEN TOWN HIGHWAYS INFRASTRUCTURE – A4130 IMPROVEMENT (MILTON GATE TO COLLETT ROUNDABOUT), A4197 DIDCOT TO CULHAM LINK ROAD, AND A415 CLIFTON HAMPDEN BYPASS) COMPULSORY PURCHASE ORDER 2022

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT TO CULHAM THAMES BRIDGE) SCHEME 2022

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT GARDEN TOWN HIGHWAYS INFRASTRUCTURE – A4130 IMPROVEMENT (MILTON GATE TO COLLETT ROUNDABOUT), A4197 DIDCOT TO CULHAM LINK ROAD, AND A415 CLIFTON HAMPDEN BYPASS) (SIDE ROADS) ORDER 2022

THE CALLED-IN PLANNING APPLICATION BY OXFORDSHIRE COUNTY COUNCIL FOR THE DUALLING OF THE A4130 CARRIAGEWAY, CONSTRUCTION OF THE DIDCOT SCIENCE BRIDGE, ROAD BRIDGE OVER THE APPLEFORD RAILWAY SIDINGS AND ROAD BRIDGE OVER THE RIVER THAMES, AND ASSOCIATED WORKS BETWEEN THE A34 MILTON INTERCHANGE AND THE B4015 NORTH OF CLIFTON HAMPDEN, OXFORDSHIRE (APPLICATION NO: R3.0138/21

PLANNING INSPECTORATE REFERENCE:

APP/U3100/V/23/3326625 and NATTRAN/SE/HAO/286 (DPI/U3100/23/12)

Appendices to the Proof of Evidence of

ALEX JAMES MADDOX

(Environmental Impact Assessment)

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Appendix AM2.1 POETS letter of the 4 November 2023

POETS letter dated 4 November 2023 requesting a further Regulation 25 Request on the grounds that the ES is allegedly deficient as it fails to assess significant environmental effects of the development beyond the Scheme boundaries, and it fails to assess adequately reasonable alternatives.

Town and Country Planning Act 1990 Section 77

The Town and Country Planning (Environmental Impact Assessment) (England) Regulations 2017

Application by Oxfordshire County Council for the Construction of Roads and Bridges (HIF1) on land between the A34(T) Milton Interchange and the B4015 at Clifton Hampden

APP/U3100/V/23/33226625

Dear Ms Macdonald,

Request by POETS for the issue of a Direction under Regulation 25 of the EIA Regulations 2017 to the Applicant in respect of the above HIF1 application

1. As previewed in our Statement of Case, POETS are asking you, as the appointed Inspector, to issue a Direction under Regulation 25 of the above Regulations (the Regulations) requiring the Applicant to provide additional information to the submitted Environmental Statement (ES) accompanying this application, so that this Statement can be considered to comply with what is required by the Regulations.

   Summary

2. The reasons why POETS consider the existing ES to be deficient are that: -

i. it fails to assess the significant environmental effects of the development beyond the Scheme boundaries, especially its proposed western and eastern ends; and

ii. it fails to assess adequately reasonable alternatives to the proposal in the form and manner required by the Regulations.

3. Consequently, we believe this submitted ES is incomplete to the extent that it fails to satisfy the requirements of the Regulations to the degree

that it should be considered as "Wednesbury unreasonable" and of no validity. If that is accepted, Regulation 3 prohibits the granting of planning permission for the application itself. In such circumstances, the only courses of action left to the Applicant are either to withdraw the application, or to accept that additional information is required to overcome the invalidity of the ES and submit the necessary additional information. We then set out the further information we believe is necessary to address the deficiencies below, subject to any other deficiencies you and/or the Secretary of State may identify. Failing submission of this material to you, POETS would point out respectfully that it would then no longer be possible for you to recommend the granting of planning permission, nor for the Secretary of State himself to grant permission.

4. In respect of both the above reasons, POETS point out the Applicant accepts that the HIF1 application (the Scheme) constitutes EIA development (Reg 2 and Schedule 2, Columns 1 and 2, 10(f)), and was submitted to Oxfordshire County Council as the relevant local planning authority (LPA). Accordingly, the form, content, objectivity, and completeness of the submitted ES is required to comply with the provisions of the Regulations. (Regs 4(2) and (3), 18 (1 -5), 19(6), 25, 26, 64,69, and Schedule 4. We believe this complies with the judgment of the Court in *R (oao Sarah FInch and Others) , and Surrey County Council and Others [2022] EWCA Civ 187*, as set out by Lindblom LJ in his summary in paragraphs 5 – 15.

5. In terms of the reasons why we do not consider the ES complies with these requirements :-

   i) <u>Failure to consider significant environmental effects of the Scheme beyond the development site, especially at its western and eastern ends</u>

   The ES fails to assess the effects of the proposal on the A415 northwest of Culham Bridge from the proposed roundabout by the Europa School west to and through Abingdon. Abingdon is a major settlement of more than 35,000 people with substantially committed areas of new housing

to the north and north-west, and expanding industrial/commercial areas to the west and south-east. Abingdon town centre also contains one of the few designated Air Quality Management Areas (AQMA) in the County outside Oxford City. At peak times the road is already heavily overloaded between Culham Science Centre and Abingdon with traffic queues of up to 2km or more at Abingdon Bridge, because it is the only route into/from the town to/from the south and south-east. This traffic then has no choice but to pass through the historic and commercial core of Abingdon on a gyratory system, covered by the AQMA, with multiple traffic lights and pedestrian crossings, which itself is blocked by traffic at peak times. This results in pollution from the emissions of stationary and slow-moving vehicles, minor accidents to people and vehicles, and severance of the commercial centre of the town to the north from the historic core and conservation area with its many listed and other historic buildings and monuments to the south and east. West of the town centre, the A415 continues about 2km to the A34 Marcham Interchange, most of this length also being heavily congested at peak times.

6. None, or almost none, of the significant effects of the proposed road on this major settlement, which is within 3km of the western end of the proposed road and which is of a size similar to Didcot, have been adequately assessed, nor have the traffic and other significant environmental effects of traffic generated by Abingdon and its committed and rapidly developing housing, commercial and industrial areas on the proposed Scheme been assessed. The allocated new large housing areas to the north and north-west, and commercial/industrial areas around the town have been permitted and are proceeding at pace so that there can be no doubt that those areas will generate substantial volumes of traffic. Some of that traffic will pass over Abingdon Bridge in both directions, given proposals for additional employment development at Didcot itself and at Culham Science Centre. Yet there is barely a mention, and no adequate environmental assessment of the quantity and effects of this committed traffic in the submitted ES. The only reference in the traffic assessment Chapter of the ES is to the housing areas north and north-west of Abingdon, but none of the environmental effects of this extra traffic, which will be substantial, have been assessed in the ES.

7. This is not a minor or technical omission from the ES, because the almost absent assessment of environmental effects has been based on, what has all too often been, the assumption that, at the point where the plans of this road are shown to end, the traffic along the road and its effects on the environment simply disappear. That is an absurd consideration as a moment's thought will confirm. Were the situation at Abingdon different, for example, with a very widespread distribution of housing and industry at very low density, as occurs in other countries such as the United States and parts of France, this might be an arguable justification for such dissipation of effects. But Abingdon is a substantial historic settlement at relatively high density, and traffic to or from the western end of the proposed Scheme can only enter or leave the town at one point, the ancient, narrow, listed and scheduled, Abingdon Bridge, and passing through the commercial and historic core of the town. Congestion is not limited only to the town centre, but also along the main roads between Abingdon and the A34 Marcham Interchange to the west, the Farringdon Road to the northwest, and the Oxford and Radley Roads to the north, and northeast.

8. The POETS therefore conclude that the virtually complete omission of the significant environmental effects of the additional traffic generated by housing and employment development between the A34 Marcham Interchange, Abingdon and the proposed Culham Roundabout and beyond to the east and south, and enabled by this Scheme, is irrational and unreasonable. It throws into question the entire basis of the traffic modelling in the ES. This conclusion is reinforced by two additional factors. These are, firstly, the fact that, just beyond the eastern end of the Scheme, along the B4015 to the Golden Balls Roundabout on the A4130 Oxford to Reading Road, and beyond, similar assumptions that the Scheme traffic and its effects will disappear. Yet proposals for upgrading the Golden Balls Roundabout are in the public domain, as are Local Plan allocations for major housing development at Berinsfield and Benson, a few kilometres south-east of the Roundabout. POETS are also aware of the concerns of residents about the inevitable significant environmental effects of the Scheme on the A417 west of the Milton Interchange towards Wantage, and the B 4017 Drayton Road northeast towards Abingdon.

9. The second factor is the proposed construction of more than 3,000 dwellings north of the Culham Roundabout, and the expansion and consolidation of Culham Science Centre as part of the Science Vale concept. The occupiers of the new dwellings will not be purely employed at the Culham Centre, nor will they only shop or work in Didcot. Both Abingdon to the west, and Berinsfield and Chalgrove to the east, would offer substantial employment opportunities, hence generating additional traffic, the environmental effects of which appear not to have been assessed by the ES. Nor does it appear that such effects on settlements west and northwest of the A34 Milton Interchange have been assessed as required. In the light of all these considerations, POETS contend that the ES should be considered as irrational and lacking in substantial evidence of its significant effects on the environment, as required by the EIA Regulations. It is in our view incomplete and invalid and hence the accompanying planning application must not be granted permission.

ii) failure to consider reasonable alternatives to the Scheme

10. POETS consider that no reasonable alternatives, other than alternative routes for parts of the proposed scheme, are put forward in the ES as modified. The ES, as modified twice by further information requested by the LPA under Regulation 25 of the Regulations, fails to comply with the required purpose of describing:
"… the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the effects." (Regulation 18(3) and Schedule 4 paragraph 2). Put simply, the alternatives studied on behalf of the Applicant, OCC as Highway Authority, by their consultants AECOM, are based on a predisposition to conclude that the only viable option to deal with transport problems in and around Didcot is to propose the construction of yet another road and modify existing roads to enable them to carry more traffic. This is contrary to for the requirement in the Regulations for objectivity and lack of bias. (Reg 64)

11. Thus in the "Assessment of Alternatives" section of ES Volume 1, Chapter 1, paragraph 3.2.3, the Scheme rationale is explained thus: -

    "It was ascertained as early as 2014 by the Vale of White Horse District Council (VoWHDC) that new highway infrastructure will be required to provide additional highway capacity between Didcot and Culham, in order to facilitate planned housing and employment growth as a number of important routes for the area will operate above their capacity with the additional associated traffic volumes. (Ref 3.19) Moreover, similar conclusions were drawn by South Oxfordshire District Council (SODC) in 2017 (Ref 3.20), as it was also established that new highway infrastructure will be required to facilitate planned housing and employment growth. Consequently, options selection has generally been focussed on either a new road connection across the River Thames or improvements to exiting infrastructure that provides a link between Didcot and Culham, as described in the Evaluation of Transport Impact reports produced by VoWHDC and SODC (Refs 3.19 and 3.20)."

12. ES Volume 1, Chapter 2, "The Need for the Scheme" explains in six paragraphs how the Applicant sees the traffic (sic) issues affecting Didcot, most recently that:
    "With large urban extensions of the 1990s (Ladygrove) and planned housing and employment growth in the 21st Century, highway infrastructure has failed to keep pace…." (para 2.1.2)
    The only references to light rail/tram or any similar, non-road-building alternatives here, is that the layout of the railway through and around Didcot is a barrier to movement and connectivity, implying that this 'barrier' is the problem, not a reasonable alternative, and therefore only road-based solutions should be given consideration. (paras 2.1.3 and 2.1.6, bullet point 4) Though alternative forms of transport are referred to in this overview, these are contained in only reference, which is also road-based:
    "…. There is also a need to plan now for all forms of travel, including modes that are only just starting to be be tested (e.g. autonomous vehicles)" (para 2.1.6, bullet point 2)

This approach continues into Chapter 3 of the ES, where the Introduction explains that three documents form the basis of the alternatives studied, namely: -

"…. Therefore, and in line with the EIA Regulations, DMRB LA 104, and the NPPG (sic), the reasonable alternatives studied by OCC (as the promoter) are reported in this chapter, along with an indication of the main reasons for the choices made, including a comparison of the environmental effects." (para 3.1.5)

13. Yet the NPPG is a constantly evolving advisory policy document, which, in the paragraphs relevant here, is almost taken as statute, whereas the 2017 Regulations are the only statutory basis for the ES. The third reference, to the DfT Design Manual for Roads and Bridges LA104, is precisely what it says, a manual showing ways in which local highway authorities should construct highway infrastructure which has been superseded by newer transport policies and advice. Rather than adding to the EIA process, its inclusion as a guide at the beginning of what should be the objective consideration of reasonable alternatives to the road as proposed, instead confirms that this is no more than a justification for a road-building exercise masquerading as an ES.

14. But the entire Chapter continues in this vein. Thus paras 3.1.6 and 3.1.7: -

"3.1.6 The preferred alignments for the four sections of the Scheme have been informed by detailed and multi-stage optioneering exercises. This includes the production of Options Assessment Reports (OAR) to identify appropriate interventions and subsequent public consultation, engineering, traffic modelling, and impact assessment work to identify the preferred alignments.

3.1.7 In accordance with DMRB LA 104, the following alternative types are reported in this chapter:"

[There then follows a list of eleven types of schemes of which only one, the 'do nothing' or 'do the minimum' might be considered as possibly non-road-building schemes.]

15. This approach continues in para 3.1.8, which lists 13 feasibility and options reports produced by the County Council and which are referred

to in the ES. Of the thirteen, eight are appraisals and studies into 11 road schemes forming part of the present HIF1 Scheme.
These eleven types of schemes and the thirteen feasibility and options reports were then considered together, sorted into categories and subjected to: -
"…. an options appraisal process to identify the best way to deliver the infrastructure for Didcot Garden Town in accordance with the set objectives (see ES Chapter 2: The Scheme, Section 2.1)." (para 3.2.1)
The purpose of this part of the process was to: -
"…. describe the different options that have been considered and why they have or have not been taken forward, and how environmental constraints or opportunities have influenced these decisions." (para 3.1.9)

16. There then follows an assessment based on two reports prepared by the County Council (As Highway Authority or Planning Authority?) in 2018 and 2019. Part 1 looked at creating access to the Science Vale and linking Didcot to Harwell Innovation Centre to the west on a strategic transport basis. It concluded that: -
"…. Of the options assessed, the report concluded that only the major road schemes could address the transport issues and requirements of the area. Therefore, the report concluded that the following three options under MR1 and MR2 should be taken forward for further appraisal and development: -
- The dualling of A4130 and the Science Bridge;
- A new River Thames crossing and the Clifton Hampden Bypass; and
- A combination of both options." (para 3.3.4)

17. The conclusion of the Part 1 appraisals was that, of three final options which were considered namely: -

improved cycling and walking infrastructure,
improved bus provision, use of emerging transport modes and traffic management measures, and
major road provision

a. the increased cycling and walking option would be best able to resolve the transport issues.
b. secondly, bus improvements, autonomous vehicles and traffic management measures would have less impact on the environment than the more expensive major road provision option.
c. however, it was the worst environmental option, major road building schemes MR2 and MR3, which were chosen to be taken forward for further examination and appraisal.

Such a conclusion was counter-intuitive, illogical, unreasonable, and perverse on the evidence of the stated purpose of this options appraisal, to the extent that it would appear to an independent observer that it was unreasonable. It could, apparently, be called an example of the philosophy of "Decide and Provide" which is the new approach to transport planning in the County adopted in 2022, but this would be completely misleading and wrong. What the approach to the justification for the Scheme was in practice to decide, about ten years ago, to build new and modify existing roads to overcome the undoubted traffic problems cause by overloaded roads which, even in 2014, was a wholly discredited and outdated policy. It took no account of the requirements of the Climate Change Act 2008, the warnings by the International Committee on Climate Change, nor of those of the UK Climate Change Committee to the need to reduce transport emissions urgently.

18. Part 2 of the Options Assessment Report then assessed the three options from Part 1 and added in two others, improved cycling and walking delivery and a combination of all three options plus walking and cycling improvements. Unsurprisingly, given what happened in Part 1 as explained above, the conclusion of this Part 2 assessment was: -
"…. It was concluded that option DS3 [the combination option] had the potential to fully deliver transportation benefits that align with the objectives of the Scheme and therefore, DS3 was chosen as the preferred option for delivering the objectives in accordance with the alignment shown in Figure 3.2." (para 3.3.10)
And in turn:

"….The result of the options appraisals (set out within the OAR Part 2, 2019) informed the development of further feasibility design options as described in the section below." (para 3.1.3)

19. Extraordinarily, the outcome of this conclusion was that the option with by far the greatest expenditure and the greatest by far impact on the environment (HIF1 with its four-part road schemes) was left as the dominant element of the ES. The belated inclusion of cycling and walking in this option was, in the view of POETS, no more than a sop to environmental concerns, in order to give it a cloak of respectability and responsibility so that the Scheme could be presented as a new approach to transport planning. But, as a matter of fact and degree, this inclusion of some elements of sustainable transport was nothing more than a fig leaf to try to deflect criticism from environmental groups. Nothing later in the Chapter on "Assessment of Alternatives" in the ES seeks to change the overwhelming dominance of the HIF1 roadbuilding emphasis and preconception.

20. Accordingly, the County Council decided to press ahead with the HIF1 scheme. The planning application to which the ES relates was then submitted by AECOM as agents for the County Council as Highway Authority to the County Council as Local Planning Authority on 4 October 2021. It was subsequently announced that the County Council Cabinet had agreed with Homes England and the Department of Levelling Up, Housing and Communities that funding for the Scheme had been secured and the package was presented to the public in a fanfare of publicity. (see OCC Press Release, 22 June 2022)

21. In fact, what has happened in the ES is that the entire Chapter on Assessment of Alternatives has pre-ordained the conclusion that, only by more building more roads can the existing transport (not traffic) issues in and around Didcot be solved and prosperity be brought to the town and its surroundings. This is not how the EIA process was designed to take place, and what has been presented as an ES is in fact no such thing. It is, as POETS have already said, but which needs to be re-emphasised, that this is nothing more than an exercise which pre-judged and pre-ordained its outcome that, only by building more roads, can the problems of

transport for residents of Didcot can be resolved. The very small nod to the need to protect the environment by incorporating minor (by comparison to the scale of the road dominated HIF1) improvements and additions to walking and cycling provision is so insignificant, unwelcoming and badly designed that it does not provide a realistic option for car drivers to leave their cars at home and take one form or another of active transport.

22. Hence POETS maintain that the ES is not an objective and impartial assessment of the significant effects of the HIF1 Scheme, and in particular the ES fails to assess reasonable alternatives, as required by the Regulations and hence lacks, not just credibility, but also validity in its form and content. What has been submitted as an ES does not constitute a valid ES and, in accordance with the Regulations, cannot and should not be accepted as valid. In turns this leaves the EIA lacking its entire rationale.

23. In support of its arguments above, POETS would refer to two Court judgments on the approach to environmental assessment. The first is that of the UK Court of Appeal in the case of *R oao Sarah Finch, and Surrey County Council and Others [2022] EWCA Civ 187*, especially in para 15, where Lindblom LJ sets out the correct approach to be taken in carrying out environmental assessment. The second case is the judgment of the European Court of Justice in *Holohan and Others and An Bord Pleanála [2018] Case C-461/17*, and in particular paragraphs 60-70. The Court's Ruling No. 5, identifies the need in the ES for information in relation to the environmental impact of both the chosen option and of all the main alternatives studied by the developer, together with the reasons for his choice, taking into account at least the environmental effects, even if such an alternative was rejected at an early stage. In the case of the ES submitted and amended following not just one, but two, Regulation 25 requests by the LPA, still fails either to undertake the correct approach to environmental assessment set out in *Sarah Finch*, nor the correct approach to assessment of main alternatives as per *Holohan*.

24. Accordingly, POETS reiterate that no main alternatives beyond road building have been considered nor assessed in the ES, which was predisposed to proposing more highway construction as the preferred, if not the only, reasonable solution to existing transport issues. This demonstrates that the entire concept of the scheme was and is driven by a foregone conclusion of circularity. The issue underlying the rationale for HIF1 is defined as the need for more road building, and therefore the only reasonable alternative proposed studied and proposed by this application is to build this major, four-part road. The way in which this conclusion was reached in the ES as submitted and amended is completely inadequate, irrational, pre-ordained and contrary to the purposes and requirements of environmental assessment in an EIA and hence is Wednesbury unreasonable. It follows that the ES in its current form is of no validity and, for this reason alone, no valid but necessary EIA exists. It follows that planning permission cannot and must not be granted. (Regulation 3, 2017 EIA Regulations) and either the Applicant should withdraw this application or accept that substantial amendment should be made following a request under Regulation 25.

Conclusion

25. Accordingly, POETS request that, if she accepts these arguments, the Inspector should issue such a request as soon as possible to remedy the deficiencies of the ES identified above, or should request the Secretary of State to do so.

Richard Tamplin for POETS
4 November 2023

Appendix AM2.2 TAG: An Overview of Transport Appraisal 2014

This document provides an overview of the TAG guidance.

Department for Transport

TRANSPORT ANALYSIS GUIDANCE

An Overview of Transport Appraisal

January 2014

Department for Transport

Transport Analysis Guidance (TAG)

https://www.gov.uk/transport-analysis-guidance-tag

Technical queries and comments on this TAG Unit should be referred to:

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1 An Overview of Transport Appraisal

1.1 Introduction

1.1.1 This unit contains general introductory information on the role of transport modelling and appraisal, and how the transport appraisal process supports the development of business cases supporting investment decisions.

1.1.2 The key principles from HM Treasury's Green Book are also set out here, with explanation on how these principles have been applied in the transport appraisal context to support investment decisions.

1.1.3 There is also explanation at the end of the unit to describe how the rest of the guidance has been restructured from the previous version TAG.

1.2 What is the purpose of TAG and what does it cover?

1.2.1 TAG (Web-based Transport Analysis Guidance) is the Department's transport appraisal guidance and toolkit. It consists of software tools and guidance on transport modelling and appraisal methods that are applicable for highways and public transport interventions[1]. These facilitate the appraisal and development of transport interventions, enabling analysts to build evidence to support business case development, to inform investment funding decisions.

1.2.2 Development of analysis using TAG guidance is a requirement for all interventions that require government approval. For interventions that do not require government approval this guidance would serve as a best practice guide.

1.2.3 However, there is a key distinction between the transport appraisal process and the decision-making process. The transport appraisal process is about options generation, development and evaluation of intervention impacts. In contrast, the decision-making process involves a separate governance process concerned with identifying and implementing interventions that deliver the needs of the sponsoring organisation and fits best with its investment funding objectives. On April 2011, the Department published the **Transport Business Case Assessment** (DfT, 2011), setting out the principles on how the Department assesses the business case for major investments and supports Ministers as they make decisions on them.

1.2.4 Whilst the Transport Business Case Assessment is developed based on HMT's '5 Case Model' [HMT] for business case preparation, TAG is developed based on HMT's Green Book [HMT, 2007], that sets out the framework for appraisal and evaluation for all policies, programmes and projects. This constitutes binding guidance on all departments – including the Department for Transport – and executive agencies. The binding nature of the guidance ensures that interventions from different departments are directly comparable, even if the detail of the analytical techniques used to estimate impacts vary from Department to Department.

1.2.5 Figure 1 below illustrates the relationship between the transport appraisal process (on the far left) and the decision-making process (top right). The application of the '5 case model' for business case development requires the investment decision to be considered from five perspectives – the Strategic case, Economic case, Commercial case, Financial case and the Management case. These are illustrated conceptually by the coloured boxes as part of "Development of evidence for business case". Subsequent sections in this unit will elaborate on how appraisal outputs produced from TAG and other guidance can be used to develop evidence for these five cases.

[1] The word 'interventions' is used to cover the entire range of measures from demand management measures through to major engineering projects.

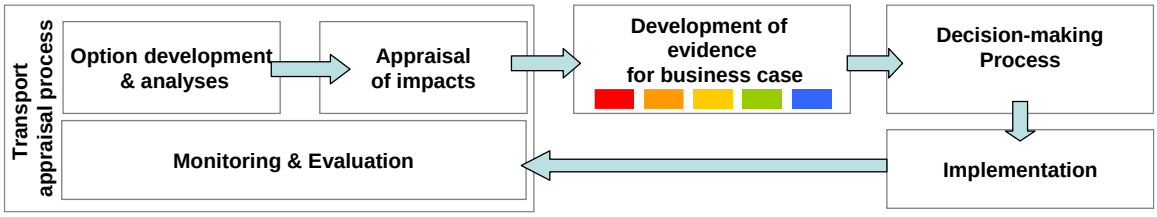

Figure 1 **Relationship between the transport appraisal process and the decision-making process**

1.3 How Green Book principles have been applied to transport appraisal

1.3.1 The Green Book recommends the cost-benefit analysis approach to appraisal. Applying this to the transport context, transport appraisal draws together information on a wide range of impacts – it does not just consider the direct impacts on the transport users and service providers affected by the intervention, but also the impacts of the intervention on the environment, wider society and government. Analysts should seek to place a monetary value on as many of the impacts as possible to allow a direct comparison between the costs and benefits of the intervention. To assist analysts involved in transport appraisal, TAG provides guidance to enable option development and analysis; and the appraisal of impacts (costs and benefits) produced by each option.

Option development and analysis

1.3.2 The effects of transport interventions are often complex. The requirement to analyse the wide range of impacts in cost-benefit analyses translates to the need to understand and measure how transport interventions will change patterns of travel (choice of origin and destination; frequency; distance), patterns of social activity (work and leisure) and impact on the environment. This has led to the development of sophisticated techniques for predicting people's travel behaviours, so that analysts can refine their options and maximise the value created by their proposal. Although these sophisticated methods will be required for most major interventions, they may not be needed for small scale interventions.

1.3.3 To support the development of evidence required in cost-benefit analysis, TAG provides guidance on modelling techniques alongside the guidance on appraisal. It covers subjects such as forecasting future levels of demand and modelling the impacts that a proposal will have on travel choices such as route choice, choice of destination and choice of mode.

1.3.4 As far as possible minimum standards have been specified to provide promoters with a clear indication of the Department's expectations of the quality of modelling that should be provided to ensure the business case is supported by robust evidence.

1.3.5 There are some impacts – such as noise, air quality, landscape, social and distributional impacts – where the transport model is unable to directly measure the impact. In such cases, guidance is provided on how the impacts can be measured using additional analyses outside of the transport model.

1.3.6 It is worth highlighting that although TAG provides best-practice guidance, it is not possible to write modelling guidance to address every eventuality and in some circumstances it might be more appropriate to deviate from these minimum standards or adopt an approach not addressed by the guidance. We therefore encourage scheme promoters to contact the Department at an early stage in the development process to discuss which techniques would be most appropriate in their particular circumstances.

Appraisal of impacts

1.3.7 Having measured the impacts of the transport intervention, the next step is to draw them together in a cost-benefit analysis. The methods used to undertake such analyses have largely been developed based on HMT's Green Book principles.

1.3.8 The Green Book advices on which analytical techniques should be used in preference to others and instructs on, for instance, how much weight to give future impacts versus present day impacts.

1.3.9 To aid consistent decision-making, monetary valuations are applied to the respective impacts to enable comparisons in cost-benefit analysis. Some of the valuations can be taken directly from prices paid in markets, or predictions of prices in future markets, e.g. fuel prices. Other valuations have been derived from research using techniques such as hedonic pricing and stated preference, e.g. the valuation of some noise impacts and the value of travel time savings. Where valuations rely on research or experimental methods they are reviewed by experts to ensure that they are robust enough to be used in cost-benefit analysis.

1.3.10 Some other impacts are simply too difficult to derive a reliable monetary value for in current practice. However, the fact that some impacts are not expressible as monetary values should not lead to the conclusion that they are neglected by the decision-maker. Instead there is guidance on how to present these in a consistent form that gives a clear sense of the severity of the impact, even if the impact cannot be simply added or subtracted from the other impacts that have been expressed in units of money.

1.3.11 To ensure that decision-makers are always presented with a full account of the impacts, all impacts – monetised, quantified, qualified wherever feasible – are summarised and presented in the form of an **Appraisal Summary Table**.

1.3.12 Figure 2 lists the appraisal outputs that can be produced from following TAG guidance. This should not be viewed as a prescriptive list, rather it aims to convey two key messages. Firstly, TAG enables the production of analyses and evidence that is sufficient to inform the Economic Case. Although these outputs may also be used to support the other cases, analysts should also be aware of separate guidance and tools that are relevant to investment appraisal of interventions. References to these have been listed in the bottom half of Figure 2.

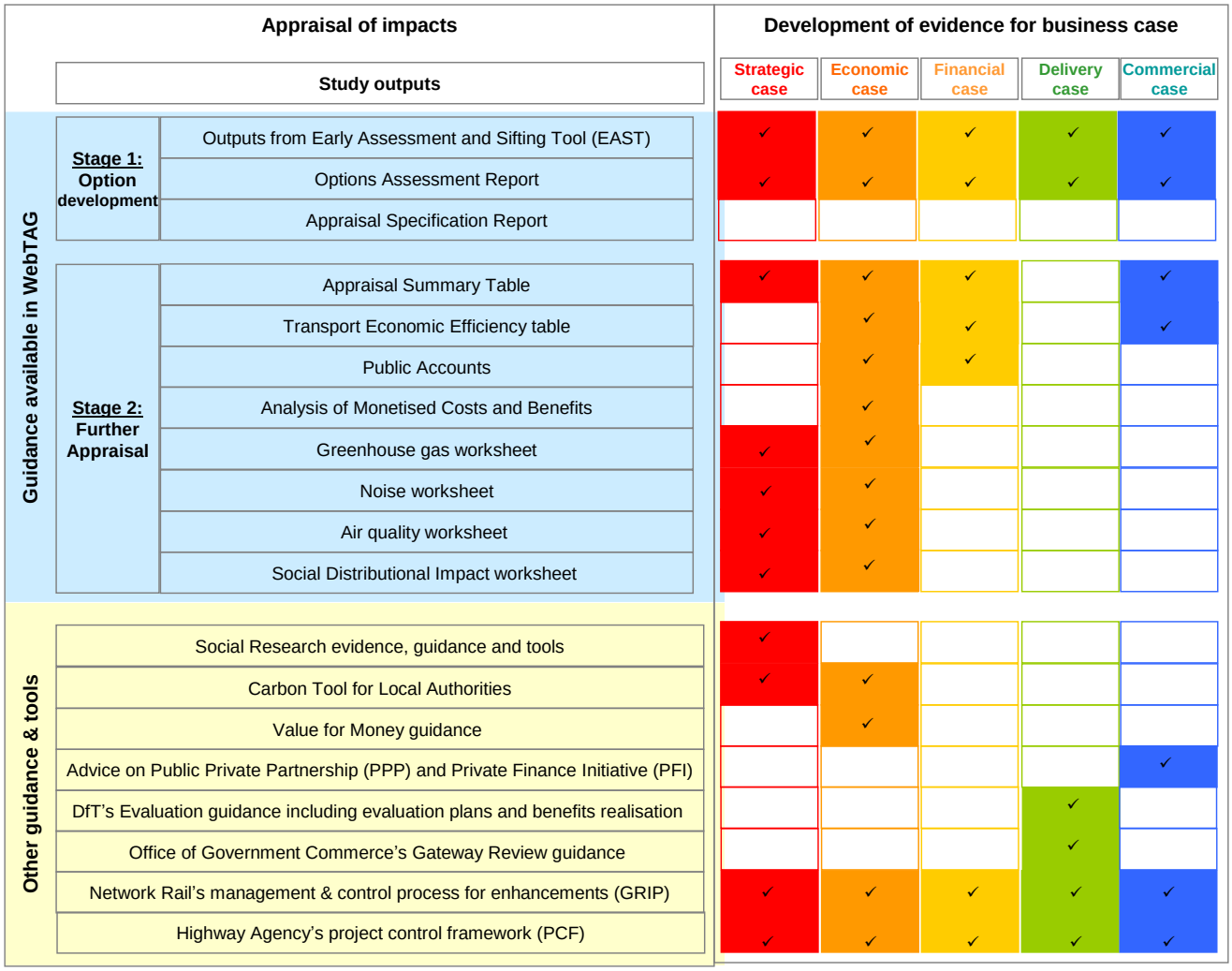

Figure 2 Tools and guidance produce evidence that can be used to answer questions posed by each case within the 'Five Case Model'

1.4 The role of the transport appraisal process

1.4.1 The transport appraisal process brings together the work required in option development, analyses and appraisal. It maps out the critical analyses and activities at different appraisal stages leading up to the various stages of business case development and approvals.

1.4.2 The design of the transport appraisal process is also underpinned by HMT Green Book principles. Before commencing a transport study, a clear mandate needs to be established setting out the rationale for the transport intervention. Once this mandate is created, analysts need to establish the study objectives and consider a broad range of options in early stages; these are then sifted against a set of criteria to shortlist preferred options. All assessments should be carried out in a proportionate manner. Key stakeholders should be involved and engaged even from early stages. When an intervention is completed, it should undergo comprehensive evaluation. This involves examining the outturn of a policy, programme or project against what was expected, ensuring that the lessons learned are fed back into the decision-making process.

1.4.3 The design of the process ensures that, before any decision is made about an intervention, promoters and assessors have considered whether there better ways to achieve the objectives that the intervention is set out to achieve. Overall, it also aims to make the transport appraisal process more transparent and consistent with other government Departments.

1.5 How should TAG be used?

1.5.1 Transport studies often require significant resources for data collection, analyses and appraisal. This is especially true for major highway or public transport interventions requiring central government funding. The Department recognises that good project management is essential to the managing not only the delivery of transport studies, but also the risks associated with the analyses and recommendations.

1.5.2 Although the specific topic of project management is not within the scope of this guidance, TAG has been restructured into two main tiers to facilitate better project management by focusing on the needs of three main types of project team members – the Senior Responsible Officer, the Technical Project Manager and the Practitioner.

1.5.3 With the specific needs and responsibilities of these team members' needs in mind, the content is now restructured and streamlined to achieve greater accessibility and clarity of appraisal requirements for these groups of users.

Tier 2 (The Manager Tier)

1.5.4 Tier 2 provides guidance at a more general level for those managing the project and is divided further into two areas – one for the Senior Responsible Officer (SRO) and the other for the Technical Project Manager (TPM).

1.5.5 Guidance for the SRO is for those who create the mandate to initiate the transport study – usually the scheme promoter. He/she is also responsible for the overall success of the study in meeting the objectives it was set out to achieve. The SRO needs to know broadly how appraisal works and how the evidence derived from the transport study is used to support and prepare the transport business case. This will in turn enable him/her to direct the associated analyses more effectively and enhance communication with colleagues concerned with a broad range of issues including business case preparation, policy and technical challenges.

1.5.6 At this level, basic guidance is required on appraisal and modelling so that the objectives of the appraisal and modelling are understood. The SRO also needs to know what to expect from the Project Manager (TPM) so that the project may be managed more effectively. If the SRO needs to know more detail, then more detailed guidance at the TPM is available.

1.5.7 The TPM is responsible for delivering the transport study and is involved in program and project management of the required tasks. He/she needs to know what analyses are required to programme and manage the deliverables and resources effectively. He/she is the link between the SRO and analyst practitioner carrying out the detailed work. This guidance will provide some background information to the processes but will be focused on practical requirements. This will include core requirements for modelling and appraisal upfront and hence what to expect from those carrying out the work.

Tier 3 (The Practitioner Tier)

1.5.8 The Tier 3 guidance has been written for practitioners carrying out the detailed analyses. It provides good practice advice for most transport studies. Note that it is not a text book, nor does it recommend the use of methods that are at the leading edge of research. The Department recognises that, in some circumstances, the methods recommended in Tier 3 may not be appropriate. Where alternative techniques appear to be more suited to the case in hand, Project Managers will need to liaise with Senior Responsible Officers and the Department to agree on the best way forward.

2 References

Department for Transport, 2011, **The Transport Business Case**, Available at: <http://www.dft.gov.uk/publications/transport-business-case/>

HM Treasury, **Business Case guidance**, Available at <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent>

HM Treasury, 2007, **Green Book (Appraisal and Evaluation in Central Government)**, Available at <http://www.hm-treasury.gov.uk/data_greenbook_index.htm>

3 Document Provenance

This is a new TAG Unit created for the restructured TAG guidance.

Appendix AM2.3 Flood Risk Technical Note December 2022

A Flood Risk Technical Note provided to the Environment Agency in December 2022 following a preceding Flood Risk Technical Note submitted as part of the Regulation 25 Request (November 2022) [CD B.2, Appendix M].

AECOM

AM2.3

Flood Risk Technical Note: Additional Information Addendum

Regulation 25 Response

Oxfordshire County Council

Didcot HIF 1

December 2022

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	02/12/2022	Draft	HH	Hannah Howe	Principal Consultant
2	08/12/2022	Draft	HH	Hannah Howe	Principal Consultant
3	08/12/2022	Draft	HH	Hannah Howe	Principal Consultant

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1. Executive Summary

1.1 Background

On the 14th of April 2022 the Environment Agency (EA) objected to the proposed Didcot HIF1 development (referred to as the 'Scheme') on the land between Didcot and Clifton Hampden (Didcot to Culham River Crossing). The objection was on the grounds that there is an unacceptable risk to the environment. One of the reasons for this was stated that the Flood Risk Assessment (FRA) did not demonstrate that there will be no increase in flood risk to the surrounding area.

A technical note response (GEN_PD-ACM-EWE-SW_ZZ_ZZ_ZZ-TN-FR-0001, subsequently referred to as 'the July Technical Note') was prepared and issued on 20th July 2022. This technical note included further analysis of time series PO points, which suggested a model tolerance of +/- 20mm would be more appropriate for assessment considering the limitations of the model. The July Technical Note also reconsidered mitigation for the Scheme, including updated storage compensation volumes and an additional area of land was identified for flood mitigation which will be subject of a compulsory purchase order. This area is adjacent to the proposed Sutton Courtenay roundabout, to the south of the River Crossing.

The EA responded to the July Technical Note on the 23rd of November 2022. The EA welcomed the inclusion of additional flood storage mitigation. In addition, the EA have understood constraints of the modelling and have accepted that the areas of 'hatching' within the outputs are likely to be accountable to tolerance issues. However, the EA consider it necessary to seek mitigation for an area of increased flood levels (10mm +/-) on the south bank of the river Thames, directly opposite the flood compensation area (shown in Figure 1). The EA's opinion is that the 20mm model tolerance defined in the July Technical Note cannot be applied to this area.

The 'Area of Concern' is a pumping station, relating to the Didcot power station sites. Whilst this area was not expressly investigated as part of the July Technical Note, additional investigation and sensitivity testing has been undertaken. The aim of sensitivity testing in this area of the model is to understand and quantify whether this area of depth change is likely to be an impact as a result of the Scheme, and whether additional mitigation is required.

1.2 Summary of Findings

Within the Area of Concern (shown in Figure 1), model results generally show an increase in water levels (10-20mm) between the Baseline and Scheme results in the FRA modelling. This specific area does not exhibit the 'hatching' described in the July Technical Note, and therefore warrants further investigation. On examination of the Baseline model assumptions in this Area of Concern, the findings are as follows:

- In the 1D channel, between the cross section adjacent to the area of concern and the next upstream cross section there was a distance of 300m;
- In the 2D domain, the model grid values in this area do not accurately reflect the topography, which may be due to poor filtering on the LiDAR;
- In the 2D domain, the roughness values applied to this area were significantly higher than surrounding land.

These three factors raise concerns as to model confidence in this area, and whether the changes in depth can be attributed to the Scheme, or as a result of model assumptions. This area had not been substantially upgraded as part of the FRA modelling, as no changes were proposed in this area. It is considered that these three elements of the Baseline model setup in this area may affect the reliability of results. The EA's 2018 Sandford to Mapledurham strategic catchment model was used as a basis for the Baseline model, with selected updates such as climate change allowances and addition of cross sections close to the proposed location of the scheme. This was agreed in pre-application advice from the EA.

Therefore additional sensitivity testing was undertaken to understand the sensitivity of the model to these elements in both the Baseline and Scheme models. These sensitivity tests included:

- Addition of 1D cross section interpolates upstream and downstream of the Area of Concern to reduce spacing between cross-sections;
- Edits to the 2D domain in the Area of Concern, affecting the representation of ground levels and roughness for the site.

The results of these model runs show that the model is sensitive to these 1D and 2D assumptions, and therefore using the model to assess impacts of less than 20mm is beyond the model confidence. However the sensitivity tests did highlight a potential area of impact (increased levels in the 10mm to 20mm range) adjacent to the scheme on the left bank. This increase was seen in the results of both sensitivity tests. To account for the uncertainty in model results here, this area is incorporated into the scheme and is to be purchased by OCC, who can locally manage this increase in flood risk without any consequence on road users or third parties. Along with mitigation previously outlined, it is considered that the proposed mitigation measures are sufficient to offset the impacts of the Scheme.

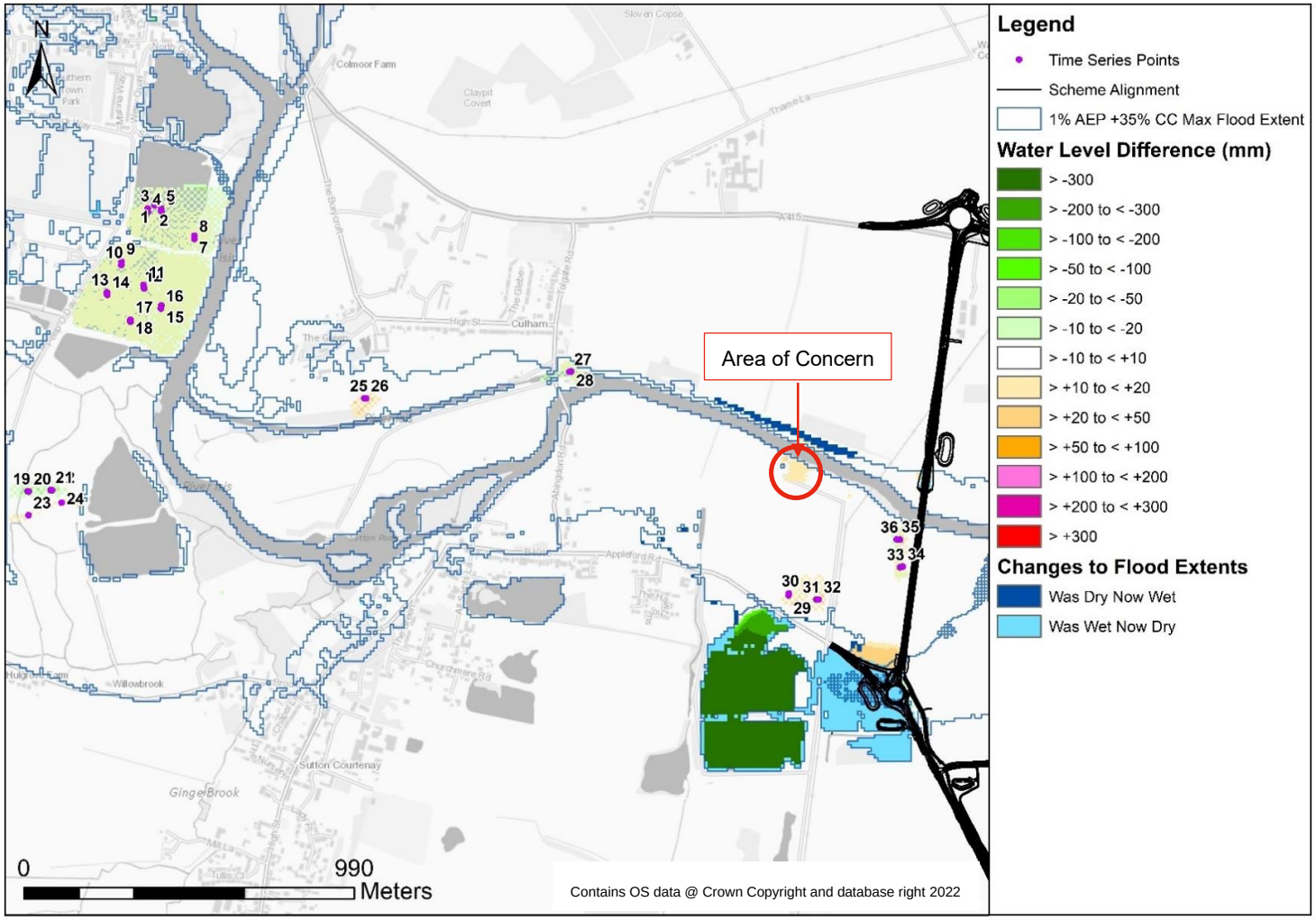

Figure 1 Water Level Difference Map between Baseline and Scheme with 10mm Model Tolerance banding applied from July Technical Note. Area of Concern circled in red.

2. Model investigation

2.1 Area of Concern and FRA modelled Water Levels

It is understood that the 'Area of Concern' includes a pumping station site related to the Didcot power station sites. Figure 3 and Figure 4 show that the site consists of buildings to house pumping station equipment, areas of open hard standing and is edged by trees and hedges. The Area of Concern also extends to the east of the pumping station site, to an area of open fields.

The water level difference between the FRA Baseline and Scheme model scenarios are shown in Figure 1 with 10mm bandings. In the July Technical Note, it was highlighted that a model tolerance figure of 20mm would be more appropriate considering model instabilities. However, the area highlighted as the 'Area of Concern' is the area for which the EA have raised concerns that the 20mm model tolerance may not be appropriate; hence the increases may be a real impact of the Scheme. Figure 2 shows in more detail the water level difference between the FRA Baseline and Scheme model scenarios, for the Area of Concern.

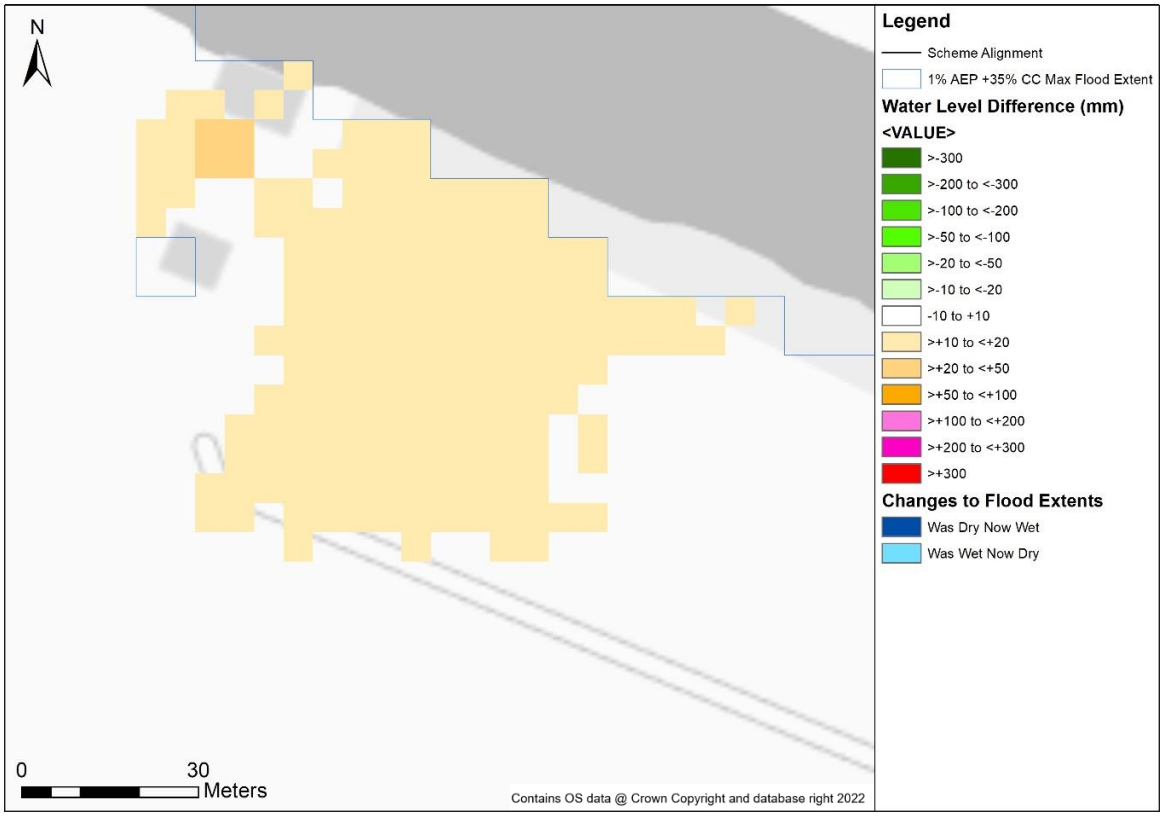

Figure 2 Water Level Difference in the Area of Concern

The water level difference between the Baseline and Scheme scenarios varies across the site. In the eastern portion of the site the depth difference is within the 10-20mm range. In the western portion of the site the depth difference is also in the 10-20mm range, with a small area of water level depth difference in the 20-30mm range.

Figure 3 View of pumping station from Left Bank Google StreetView Copyright 2022

Figure 4 Aerial photograph of the Area of Concern GoogleMaps Copyright 2022

2.2 FRA Modelling of the Area of Concern

In order to understand whether the impact described in Section 2.1 is a true impact of the scheme or a modelling anomaly, further analysis of the model assumptions and construction have been undertaken. This includes detailed consideration of the 1D and 2D elements of the model and sensitivity testing.

2.2.1 1D channel

2.2.1.1 FRA model details

On considering the Area of Concern model representation in detail for the 1D domain, it was noted that the distances between cross sections were greater in this area than in other areas of the model. The closest cross section to the Area of Concern is THA01_2720 (FM node label), which is north of the Sutton Courtenay Pumping Station. Figure 5 shows a long profile of model results (maximum water level) for the Baseline and Scheme model scenarios. In the 1D channel, there is an 20mm increase in levels at cross section THA01_2720 in the Scheme model.

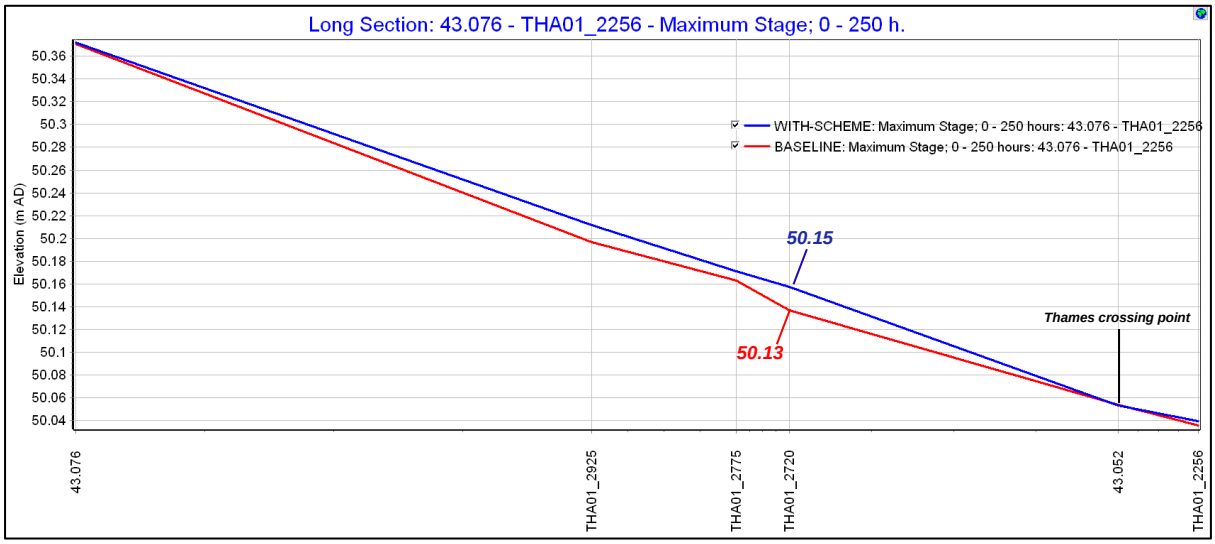

Figure 5 Long section 1D channel levels for Baseline and Scheme FRA model - 1% AEP + 35% climate change

In the 1D model network there is approximately 150m between cross section THA01_2720 and the next cross section upstream and approximately 330m between THA01_2720 and the next cross section downstream. The cross-section spacing was not modified from the original EA model for the FRA modelling, as the Scheme is proposing no changes here. Given the wide and inconsistent spacing between cross sections, there is low resolution in the 1D model results adjacent to the Area of Concern, which may influence the flow of water across the 1D to 2D boundary.

2.2.1.2 Sensitivity test for 1D channel updates

To understand the impact of the irregularly spaced cross sections, interpolated cross sections were added to the 1D channel. This reduced the cross section spacing to 50m in the stretch between cross sections THA01_2925 and 43.052. The updates to the Flood Modeller 1D network for this test can be seen in Figure 6.

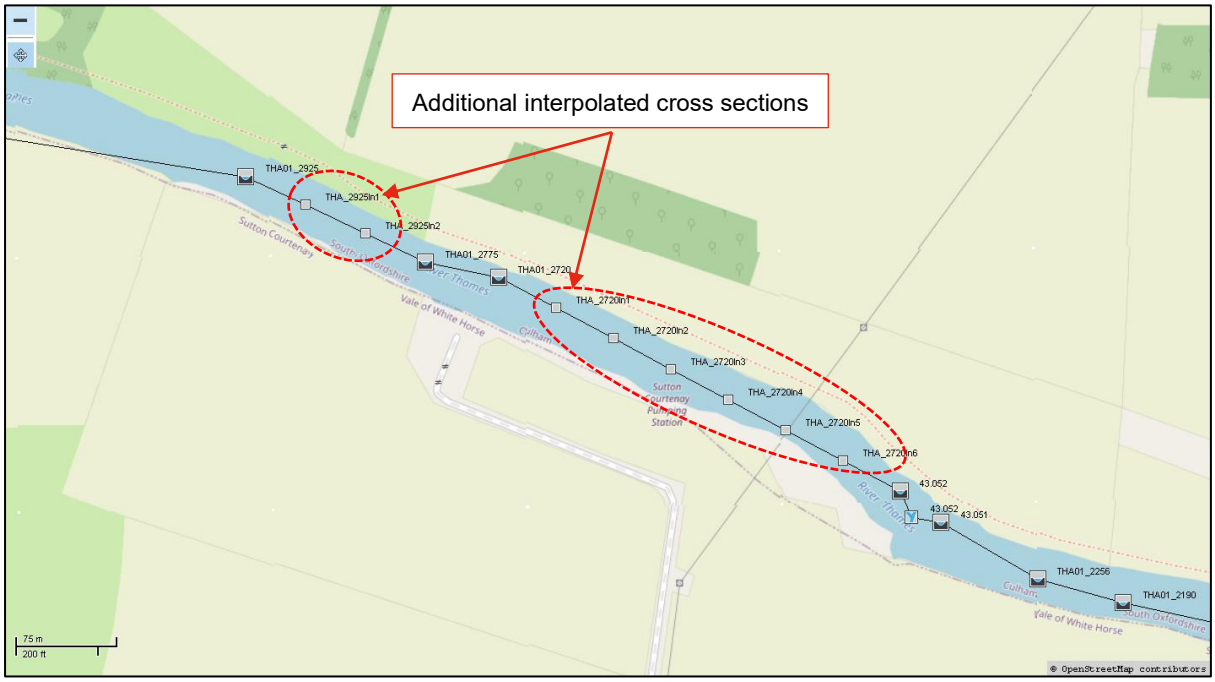

Figure 6 Interpolated cross sections added to 1D channel

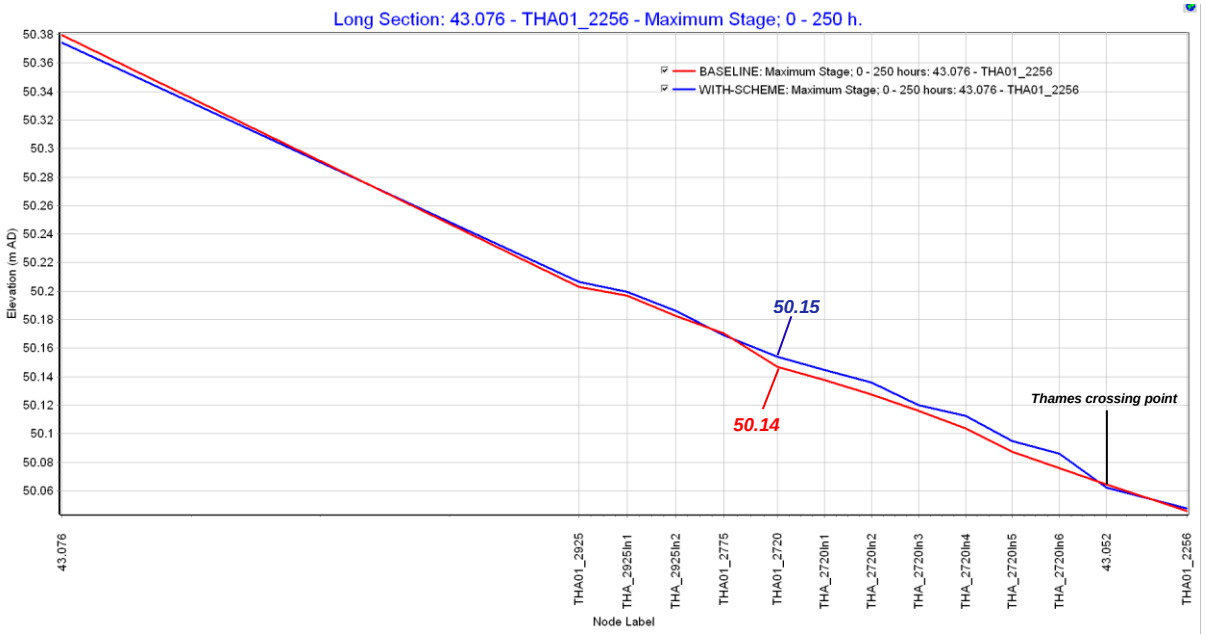

Figure 7 Long section 1D channel levels for Baseline and Scheme after 1D model updates -1% AEP + 35% climate change

The model was re-run with no other changes made. The results can be seen in Figure 7.The addition of interpolates improves the resolution and confidence in the 1D channel levels. With this improved resolution, the long section results show a water level difference of less than 10mm, which is a reduction from the difference of 20mm seen in previous modelling.

Figure 8 shows the impact of these changes on the floodplain results, showing the 2D depth difference between the Baseline and Scheme scenario. Making this change has reduced the 2D impact in the Area of Concern to less than 10mm, and therefore does not show as an impact in Figure 8. In this sensitivity test, model results are showing a change in water levels adjacent to the Scheme, upstream of the embankment. In this area the water level difference between the Baseline and Scheme Scenarios is 10-20mm.

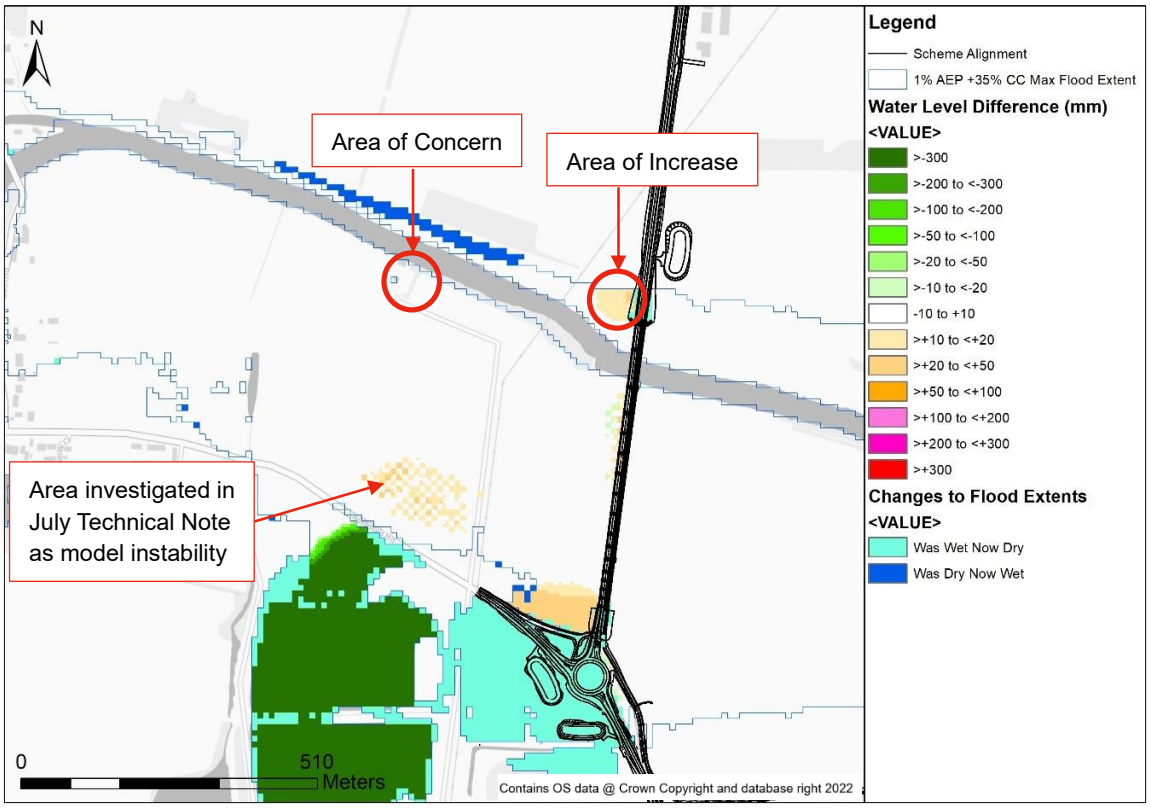

Figure 8 Depth Difference map with 1D updates - 1% AEP + 35% climate change

The purpose of this sensitivity test is not to replace or revise modelling which has been provided to support the FRA. These results highlight the sensitivity of this model to assumptions which were made during the construction of the EA's 2018 Maple Durham to Sandford model. Considering these results it is apparent that the model is sensitive to the 1D model setup in the Area of Concern.

2.2.2 2D domain

On considering the Area of Concern model representation in detail it was noted that there may be potential irregularities in the 2D domain. This is highlighted in the flow vectors created from model results around the site in the FRA, as shown in Figure 9. Due to the irregularities in the ground elevation and the surface roughness (discussed in detail below), the model may over-represent the obstruction to flow this area creates.

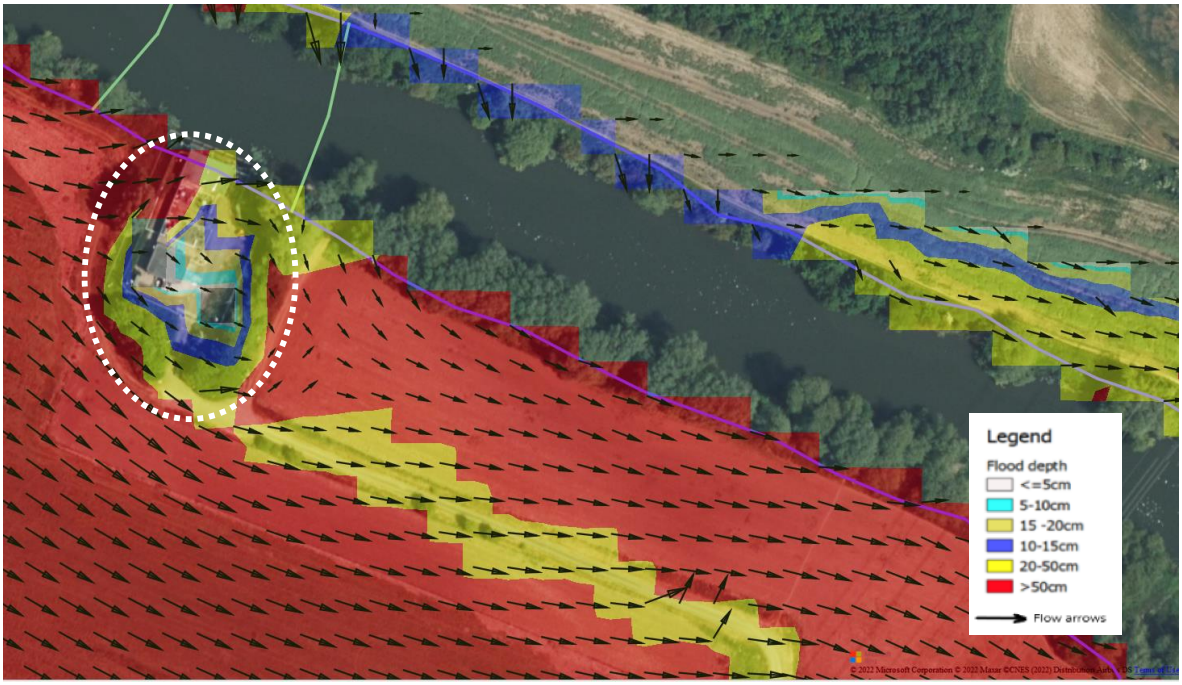

Figure 9 Flow vectors from Baseline 1% AEP +35% climate change event

2.2.2.1 Ground Model Grid

The elevations of grid cells in the 2D model are derived from the LiDAR DTM. This shows that the general elevation of the ground surrounding the site is 48.5 mAOD. The grid cell elevations in the Baseline model in this specific area were generally 1m higher than surrounding land. In addition, there appeared to be some poorly sampled cells as seen in Figure 10, with values of 44.1mAOD and 50.8mAOD which do not align with surrounding ground elevations. On comparing the values in the ground model grid against LiDAR, aerial photography and site photos, it is concluded that some of the cell elevations applied in the FRA model may not be realistic.

Figure 10 Baseline Ground Model Grid Values

2.2.2.2 Roughness Values

On further consideration of the 2D model elements, the roughness values applied to this site could be considered too high. The cells coloured red in Figure 11 have been assigned a ‘natural environment’ material class and a Manning’s n roughness value of 0.15. The ‘natural environment' classification consists of dense vegetation including heavy woodland and forest. Whilst there are some trees on the site, the area is predominantly open with a few buildings to house the pumping station equipment. It would be more appropriate to consider this area as ‘open yards’ or ‘general surface’ as the area is not densely vegetated or completely covered with buildings. For those material types, the Manning’s n values would be in the range of 0.04 to 0.08.

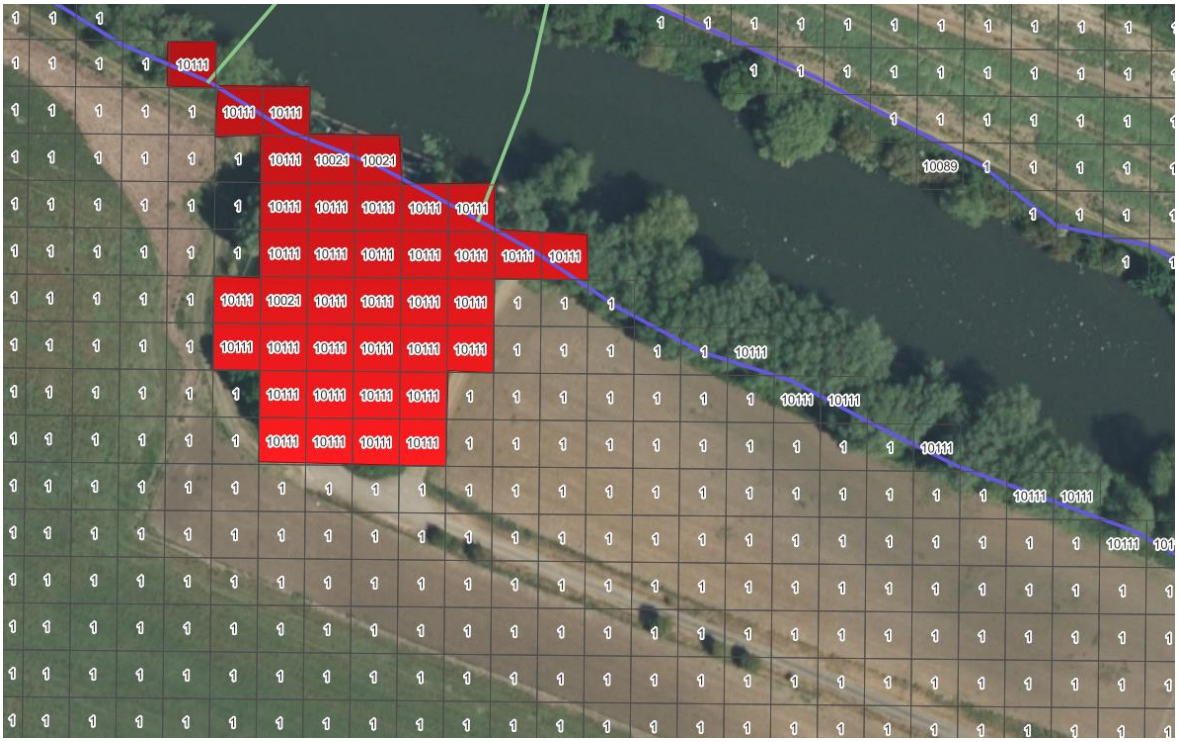

Figure 11 Baseline Roughness Values

2.2.2.3 Sensitivity test for 2D model updates

The irregularities in cell elevation and roughness demonstrated in the above figures cause impacts in the model results and assessment of the Scheme impacts. However these impacts are a localised area of low confidence in the model which are not consequential when the model is used at a strategic catchment scale.

To understand the sensitivity of the results to the ground levels and roughness values in these few cells, a model run was undertaken. A ‘Z’ Shape was used to set the pumping station site to 48.45mAOD which is more consistent with the surrounding LiDAR. In addition the Manning’s n roughness value applied to the area has been reduced to 0.08 in line with the ‘'general surface’ or ‘residential yards’ classification of the Baseline Model materials file.

The results of these changes can be seen in Figure 12. The results show that the model is sensitive to changes in the 2D representation of roughness and elevation in the Area of Concern. The updates have resulted in changes to the flow mechanisms in the floodplain.

With this change, there is also a change to water levels on the north bank of the river adjacent to the Scheme, which is similar to that shown for the 1D sensitivity test. This area sees a water level difference change between the Baseline and Scheme scenario of 10-20mm.

As has been seen in previous presentations of model results, in this sensitivity test there is an area of ‘hatched’ results showing impacts of 10-20mm. This area is labelled as ‘Area of Instability’ in Figure 12. As described in the July Technical Note, ‘hatched’ results appear to be a result of instabilities in the model, and therefore should be viewed as low confidence results. The instabilities shown as changes in water level of 10-20mm are within an extensive floodplain (approximately 780m wide) where Baseline flood depths are in excess of 2m.

It is apparent that the model is sensitive to assumptions in the floodplain representation in the 2D domain in the Area of Concern. Therefore, it is unlikely that the depth increases in the Area of Concern shown in Figure 1 are a

real consequence of the Scheme and these are more likely caused by a combination of model assumptions and the accuracy of the model when considering water level difference values below 20mm.

However, given that the same area adjacent to the Scheme has been highlighted as at risk from increased levels in both sensitivity tests, (labelled 'Area of Increase' in Figure 8 and Figure 12) it is recommended that additional mitigation is implemented in this area to allow for the uncertainty in model results.

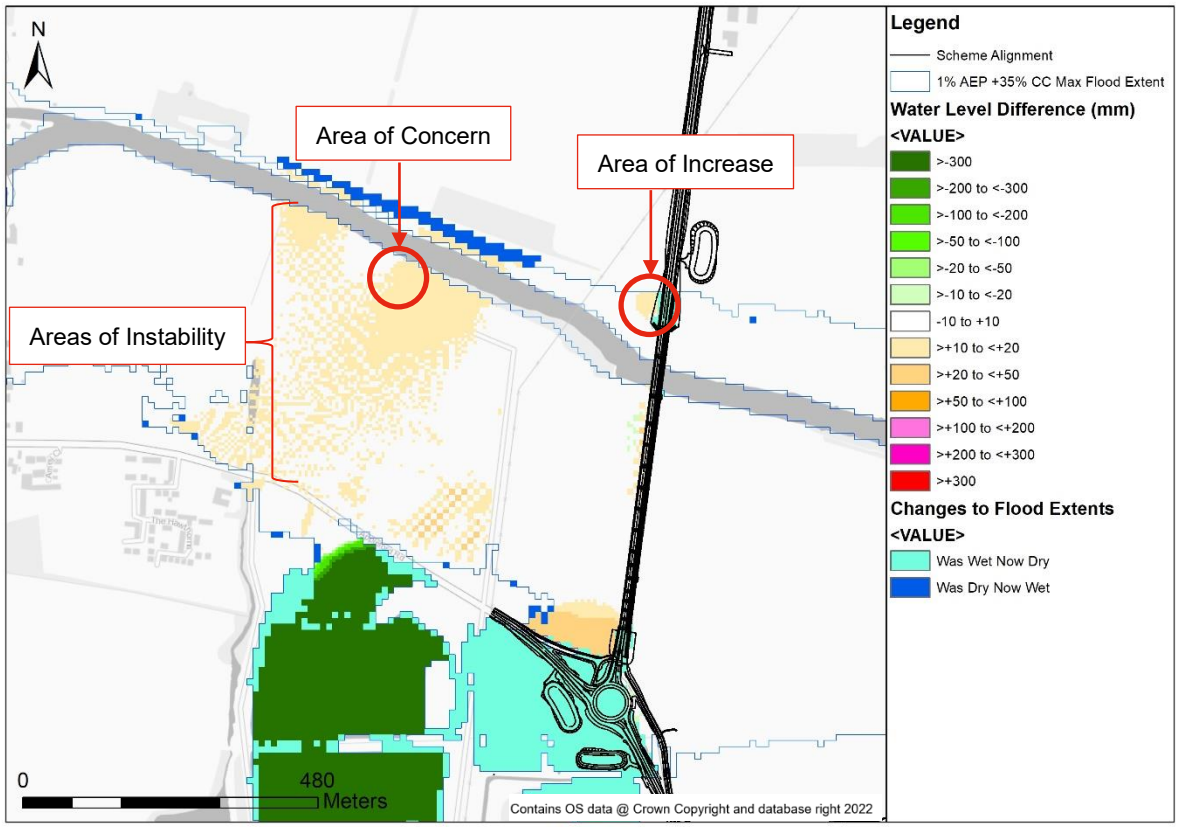

Figure 12 Water Level Difference Map with 2D model updates - 1% AEP + 35% climate change

2.3 Mitigation

On considering the sensitivity model results, the question is whether the mitigation proposed as part of the Scheme design is adequate. Regarding mitigation, three approaches have been taken for the Didcot to Culham River Crossing section of the Scheme:

i. Crossing design chosen was an open viaduct span bridge, to allow conveyance of flows through the area unimpeded;

ii. Land to the west of the Sutton Courtenay roundabout will be subject to a Compulsory Purchase Order to manage the risk of increased levels in this area;

iii. Storage compensation will be constructed on the Left Bank of the Scheme.

The storage compensation design (RIV_PD-ACM-GEN-SW_ZZ_ZZ_ZZ-DR-CH-0011) was developed using the footprint of the Scheme, the Baseline water level for the 1% AEP event +35% climate change event and an increment of 0.1m plane height. As shown in Table 1, there is a net gain in floodplain storage volume at each plane height through the Scheme and mitigation. This shows that there is adequate storage compensation included in the design to offset the footprint of the Scheme and improve the storage capacity of the floodplain.

As discussed in the FRA sections 7.1.8 to 7.1.15, the design of the floodplain compensation is currently based upon the 1% AEP event plus 35% climate change allowance. With the updated climate change guidance published in July 2021, this exceeds the minimum requirement of designing for a 1% AEP event plus 26% climate change allowance, and therefore provides additional flood storage.

Table 1 Level for Level Flood Compensation

Plane Height mAOD	Volume lost due to Scheme (m^3)	Volume provided from Storage compensation (m^3)	+/- Volume gain (m^3) in Flood Plain from storage compensation
48.1	1	2	+1
48.2	23	31	+8
48.3	44	53	+9
48.4	76	82	+6
48.5	102	110	+8
48.6	110	125	+15
48.7	155	163	+8
48.8	233	257	+24
48.9	503	538	+35
49	758	773	+15
49.1	854	864	+10
49.2	925	942	+17
49.3	987	1040	+53
49.4	1073	1082	+9
49.5	1174	1196	+22
49.6	1257	1275	+18
49.7	1356	1382	+26
49.8	1448	1470	+22
49.9	1506	1540	+34
50	1557	1643	+86

The model has been used to support the FRA to understand the potential impacts of the Scheme. However, given the sensitivity of the model, there are limitations in using the model to reliably demonstrate the impacts of mitigation measures. Sensitivity tests in Sections 2.2.1 and 2.2.2 show that if the model is used to quantify impacts of 20mm or less, results should be treated as low confidence.

The sensitivity tests of the 1D and 2D assumptions have also shown that the area adjacent to the Scheme is at risk of increased water level depths of between 10mm and 20mm if the model assumptions are revised. Whilst we maintain that the assessment of depth changes of less than 20mm are beyond the accuracy of the model, we acknowledge that modelled results in this particular area are sensitive to some of the assumptions and decisions made in the model setup. The area of increase is within the red line boundary, in an area already incorporated into the Scheme with the land to be purchased by OCC. The mitigation area highlighted in Figure 13, is in addition to areas of mitigation previously identified. OCC will own the land impacted, and therefore can locally manage this increase in flood risk without any consequence on road users or third parties.

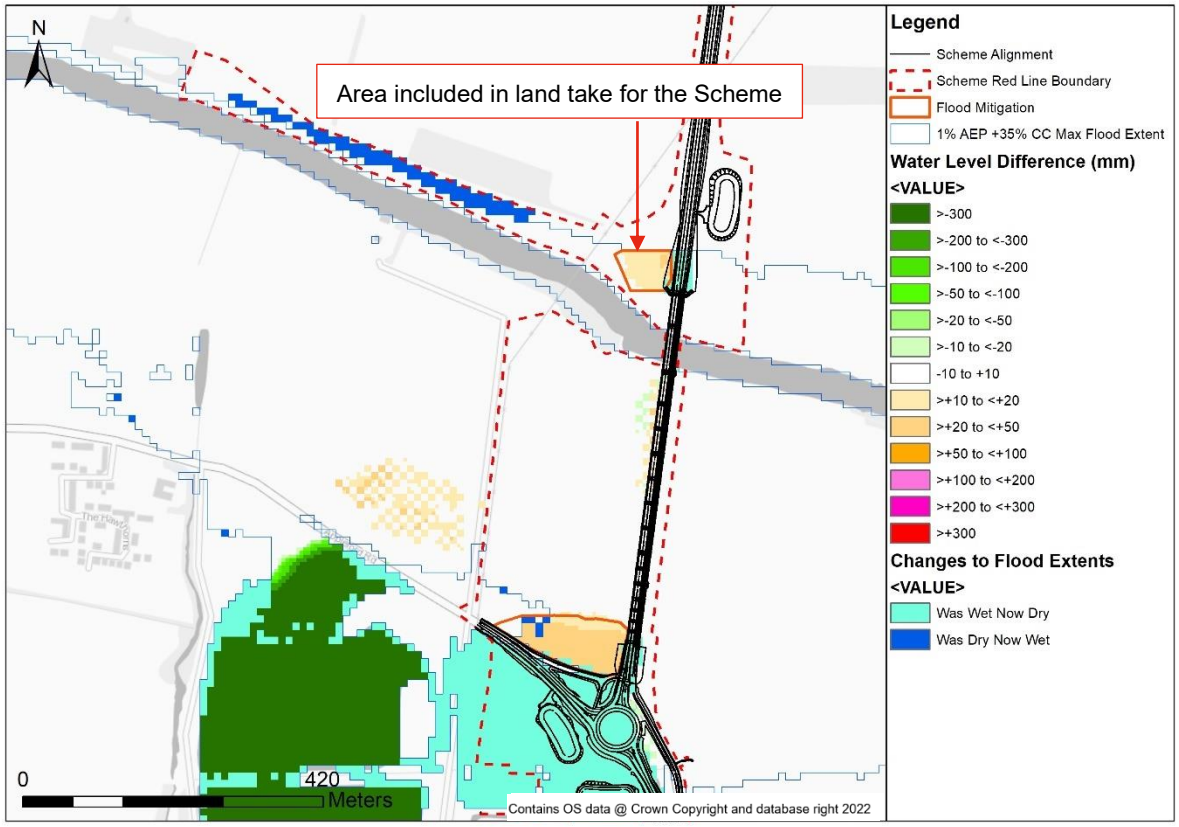

Figure 13 1D sensitivity test depth difference map with red line boundary - 1% AEP + 35% climate change

3. Conclusion

It is considered that using this model to assess impacts of less than 20mm is beyond the accuracy of the model, and therefore depth difference changes of less than 20mm shown in the results should be considered as having low confidence. Sensitivity tests have shown that model results which indicate potential increases in flood depth in the Area of Concern are sensitive to minor changes in model assumptions. With minor changes in model assumptions, the model results do not indicate depth increases greater than 10mm in this area. Therefore, it is concluded that the increases showing in the 'Area of Concern' (Figure 1) are not significant consequences of the Scheme.

However, the results of both the 1D and 2D sensitivity tests show that while the Area of Concern is unlikely to be a real impact of the Scheme, there may be a potential area of increased flood depth (10-20mm range) adjacent to the road embankment to the north of the River Thames. This area is incorporated into the Scheme and is to be purchased by OCC, who can locally manage this increase in flood risk without any consequence on road users or third parties.

Furthermore, the mitigation provided to compensate for the Scheme has been designed to a higher standard than the minimum requirements. The mitigation and storage compensation have been designed to a 1%AEP + 35% climate change allowance, rather than the 26% climate change allowance, and still provides a net volume gain in flood storage at each plane increment. Given the design of the mitigation to a higher climate change allowance and the net gain in floodplain storage, it is considered that the mitigation measures proposed are sufficient to offset the impacts of the Scheme and cover for the uncertainty in the model.

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Appendix AM2.4 Ecology Technical Note

A Technical Note reviewing bat roosts, biodiversity implications and habitat restoration including Hanson Restoration Scheme (Bridge Farm quarry).

AM2.4

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT GARDEN TOWN HIGHWAYS INFRASTRUCTURE – A4130 IMPROVEMENT (MILTON GATE TO COLLETT ROUNDABOUT), A4197 DIDCOT TO CULHAM LINK ROAD, AND A415 CLIFTON HAMPDEN BYPASS) COMPULSORY PURCHASE ORDER 2022

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT TO CULHAM THAMES BRIDGE) SCHEME 2022

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT GARDEN TOWN HIGHWAYS INFRASTRUCTURE – A4130 IMPROVEMENT (MILTON GATE TO COLLETT ROUNDABOUT), A4197 DIDCOT TO CULHAM LINK ROAD, AND A415 CLIFTON HAMPDEN BYPASS) (SIDE ROADS) ORDER 2022

AND

THE CALLED-IN PLANNING APPLICATION BY OXFORDSHIRE COUNTY COUNCIL FOR THE DUALLING OF THE A4130 CARRIAGEWAY, CONSTRUCTION OF THE DIDCOT SCIENCE BRIDGE, ROAD BRIDGE OVER THE APPLEFORD RAILWAY SIDINGS AND ROAD BRIDGE OVER THE RIVER THAMES, AND ASSOCIATED WORKS BETWEEN THE A34 MILTON INTERCHANGE AND THE B4015 NORTH OF CLIFTON HAMPDEN, OXFORDSHIRE (APPLICATION NO: R3.0138/21

PLANNING INSPECTORATE REFERENCE:

APP/U3100/V/23/3326625 and NATTRAN/SE/HAO/286 (DPI/U3100/23/12)

Technical Note prepared by

PAUL MAXWELL WADE

(Biodiversity: bat roosts, biodiversity implications and habitat restoration including Hanson Restoration Scheme (Bridge Farm quarry))

Table of Contents

1 INTRODUCTION AND QUALIFICATIONS

1.1 I am Professor Paul Maxwell Wade, a Chartered Environmentalist and a Chartered Ecologist .. I am a Technical Director at AECOM and have been with AECOM for nine years. I hold a BSc (Hons) in Applied Ecology and a PhD in Ecology. I am a Fellow of the Chartered Institute of Ecology and Environmental Management (FCIEEM).

1.2 I have 40 years' experience as a professional ecologist, 25 years in Higher Education and 15 years as an ecological consultant. My current role is primarily the delivery of ecology appraisals with an emphasis on biodiversity including for highways projects from initial conception to the planning application stage, to the pre-construction stage. I have worked on highways schemes being consented under the Town and Country Planning Act 1990 and under the Planning Act 2008.

Scope of Technical Note

1.3 The purpose of this technical note is to explain the biodiversity assessments of the Scheme that have been undertaken, in particular to explain the implications of the Scheme with respect to:

1.3.1 bats roosts;

1.3.2 biodiversity; and

1.3.3 habitat restoration and in particular the Hanson Restoration Scheme (also known as the Bridge Farm restoration).

1.4 This technical note should be read in conjunction with:

1.4.1 Environmental Impact Assessment proof of evidence, prepared by Alex James Maddox of AECOM; and

1.4.2 Chapter 9 of the Environmental Statement [CD B.1] and associated appendices in particular Appendix 9.9 - Report on Surveys for Bats [CD A.17], Appendix I– Report on Biodiversity [CD C.2] and the Outline Landscape and Biodiversity Management Plan [CD A.11].

2 APPRAISAL OF BAT ROOST POTENTIAL

2.1 All bat species and their roosts are legally protected in the UK under the Habitats and Species Regulations, which implemented the EC Directive 92/43/EEC (the Habitats Directive). In addition, four UK bat species are listed in Annex II of the Habitats Directive, which requires sites to be designated in member states for their protection. Bats and their roosts are also protected under the Wildlife and Countryside Act 1981 (as amended).

2.2 On the basis of a Preliminary Ecological Appraisal (PEA), comprising a desk study and field surveys of the biodiversity of the proposed Scheme undertaken from January 2020 onwards, it was determined that a survey was needed focussing on the potential of features such as trees and buildings to support bats roosts (see Appendix 9.1 of Chapter 9 - Biodiversity [CD A.17]).

2.3 A Preliminary Roost Assessment (PRA) was completed in the period April to October 2020 of land within the Scheme boundary and up to 100 metres from it, where access was available. An assessment was undertaken of buildings, other structures and mature trees, following guidance as described in the Bat Conservation Trust (BCT)'s 'Bat Surveys for Professional Ecologists: Good Practice Guidelines; (Collins, 2016). The PRA identified 23 buildings and other structures and 126 trees across the Site as having bat roost suitability.

2.4 Following this, buildings and other structures and trees with the potential to support roosting bats were surveyed based on the standard method for bat emergence and, or re-entry surveys to determine if a potential roost feature was used by bats and, where present, to characterise the roost. The method was as described in the BCT guidelines (Collins, 2016).

2.5 Three species of bat, (Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Brown Long-eared bat (*Plecotus auritus*), were confirmed to be roosting within trees and buildings within and adjacent to the Scheme.

2.6 These comprised roosts in eight buildings and three trees, consisting of day, night and feeding roosts used by small numbers (1-7 individuals) of common and widespread species of bat, all assessed to be of local importance with respect to roosts using evaluation criteria set out in 'Valuing Bats in Ecological Impact Assessment' Wray et al. (CIEEM 'In Practice' journal No. 70, 2010)and the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018).

2.7 The Scheme will have a minor adverse impact on bat roosts with an overall 'Slight' level of effect which can be mitigated through the Outline Environmental Management Plan (OEMP) (Appendix 4.2 of Environmental Statement) and the Construction Environmental Management Plan (CEMP). None of the surveyed bat roosts will be directly impacted, i.e., lost by the Scheme.

2.8 The OEMP includes the following:

2.8.1 Pre-construction surveys must be undertaken by the Principal Contractor (ecology) to ascertain if new bat roosts exist within or immediately adjacent to the Scheme boundary. Should any such new roosts be found or known roosts put at risk (for example, due to changes in the Scheme design), the Principal Contractor (ecology) will be responsible for the application to Natural England for a European Protected Species Mitigation Licence (EPSML) in order to facilitate the works.

2.8.2 Any bat roosts identified, or trees not previously assessed for survey will be subject to preconstruction surveys and included in the licence (where applicable). The Principal Contractor (ecology) (named licensee) will be responsible for ensuring that all works detailed within the licence are carried out in accordance with the method statements. The named ecologist on the ESPML is to advise the licensee and supervise any works.

2.8.3 Any works affecting bat roosts, or structure or tree hosting such roost, will follow detailed methods and precautions outlined in the EPSML Method

Statement and licence conditions, and under the direction and supervision of the named licensed ecologist in the EPSML. This may also be licensed under the Bat Earned Recognition Licence approach (a faster/more streamlined route to a mitigation licence).

2.8.4 Where bat roosts are being retained within 50 metres of the Scheme boundary, and in respect of replacement, modified, translocated or new roosts, the following methods should be incorporated:

a) Exclusion zones to be established and maintained.
b) Any works within 20 metres of a confirmed roost shall be carried out under the supervision of, or following the advice of, an appropriate specialist.
c) Measures shall be applied to maintain dark conditions within 20 metres of identified roosts, including measures to avoid light spill from construction lighting and avoiding night-time working.
d) Works affecting bat roosts shall only commence on receipt of suitable method statements, licences, permits or other relevant approvals.

2.8.5 Works involving felling or maintenance of trees with potential for bat roosts will follow best practice methods to protect bats and their roosts. This shall include the following:

a) Any works within 20 metres of a confirmed bat roost in a tree will follow the precautions listed above.
b) All trees within 20 metres of the works area will be inspected by a Natural England licenced bat ecologist from the ground and categorised for their potential to support bat roosts, in accordance with the current best practice.
c) Trees which have no, or low suitability, can be section felled.
d) Trees which are moderate or high suitability will be re-inspected by a Natural England bat licensed ecologist, in line with current best practice guidance, and further surveys may be required.
e) Any confirmed roosts will require a Natural England EPSML to be obtained prior to felling.
f) Works affecting bat roosts shall only commence on receipt of suitable method statements, licences, permits or other relevant consents.

2.9 There are currently no bat roosts that will be impacted either directly or indirectly by the Scheme and there is no necessity to apply to Natural England for any licence.

3 BIODIVERSITY ENHANCEMENT

3.1 Biodiversity enhancement for the Scheme will be achieved through both specific species and some specific habitat initiatives and achieving biodiversity net gain. The former are referred to in Chapter 9 Biodiversity and relevant species-specific appendices, for example Appendix 9.11 - Report on Surveys for Riparian Mammals.

3.2 Consideration had been given to achieving biodiversity net gain from the outset of the project. Following updates to the landscape planting, the purpose of which was to maximise planting across the site following comments from stakeholders to increase planting, an updated BNG assessment and report was produced and submitted as Appendix I to the Regulation 25 Response April 2023 [CD C.2]. This updated BNG assessment was undertaken to quantify the overall effect of the Scheme on biodiversity and to inform the requirement for habitat creation and enhancement. The Scheme aimed to achieve at least a 10% net gain in biodiversity for all three components: habitat, hedgerow and river.

3.3 The method for the assessment used Biodiversity Metric 3.1 in accordance with the accompanying guidance at that time and best practice principles. The trading rules within Biodiversity Metric 3.1 prevent the trading down of habitat distinctiveness. Under the trading rules, losses of habitat are to be compensated for, on a “like for like” or “like for better” basis. The trading rules within Biodiversity Metric 3.1 were satisfied for each distinctiveness level for BNG assessment for the Scheme (Table 1).

Table 1. Trading rules summary

Distinctiveness group	Trading rule	Trading satisfied
High	Same habitat required	Yes
Medium	Same broad habitat or a higher distinctiveness required	Yes
Low	Same distinctiveness or better required	Yes

3.4 All pre-development baseline habitats, and habitats retained, enhanced, or created included within the proposed Scheme were included in the BNG assessment. Full details of the method and analysis can be found in Regulation 25 Response April 2023, Appendix I Revised Biodiversity Net Gain Assessment.

3.5 The Scheme is predicted to result in a net on-site gain of 146 habitat units (23%), 14 hedgerow units (41%) and <1 river unit (1%) (Table 2).

Table 2. Summary of results for area and linear habitat units; baseline and post-development

Area or linear units	Pre-development baseline	Post-development baseline	Total net unit change	Total net % change
Habitat	627	773	146	23
Hedgerow	33	47	14	41
River	21	21 (23 through TOE)	<1 (4 through TOE)	1 (10 through TOE)

3.6 Further habitat mitigation would be required to achieve a minimum of a 10% net gain in river units. To achieve this in association with the Scheme, river habitat creation and, or enhancement would need to achieve a minimum of 23 river units in total, or an additional 2 river units on top of current proposals. Potential mitigation measures for river habitats were investigated, but it was identified that achieving this within the Scheme boundary is not feasible. Therefore, a quote for the additional 2 river units was sourced from the Trust for Oxfordshire’s Environment (TOE).

3.7 The outputs of the metric are dependent on all created and retained and enhanced habitats meeting the target conditions, subject to the criteria outlined within Natural

England's Biodiversity Metric 3.1 guidance documents. Management methods to meet the target condition for each habitat will be outlined within an overarching Landscape and Ecology Masterplan for the Scheme.

3.8 It is concluded that the Scheme meets the aspiration to achieve at least a net gain of 10% in biodiversity for habitat, hedgerow and river units.

4 HABITAT RESTORATION

4.1 Chapter 9- Biodiversity is supported by a Landscape and Biodiversity Management Plan (LBMP) [CD A.11], the purpose of which is to set out the key measures required to avoid, mitigate and compensate for impacts and effects to terrestrial and aquatic habitats and landscape due to the construction and operation of the Scheme. The LBMP will also provide management prescriptions aimed at ensuring the Scheme delivers biodiversity benefits over the long term (see 3.0 Biodiversity Enhancement above).

4.2 The LBMP includes landscape and biodiversity enhancement measures which will include habitat restoration.

Table 3. Landscape and biodiversity enhancement measures

Enhancement	Key landscape elements (LE)*
Grassland with Bulbs	Grassland with Bulbs (LE1.2) will be established mainly in areas of high pedestrian use and highway verges to increase the visual amenity and enhance the sense of a gateway/entrance.
Low Growing Species Rich Grassland	Low Growing Species Rich Grassland (LE1.3) will be established mainly on highway verges, visibility splays and roundabouts, and will provide biodiversity, visual and amenity benefits throughout the Scheme. Wet flower-rich grassland approximating to MG4/MG5 grassland is proposed in the Hanson Restoration area.
Native broad-leaved woodland	Woodland (LE 2.1) is proposed in areas where large areas of structural planting will assist to screen views of the Scheme from the neighbouring landscape and provide biodiversity and landscape integration benefits. Wet woodland is proposed to the west of the Scheme in the Hanson Restoration area.
Native woodland edge	Woodland edge (LE 2.2) is used throughout the Scheme as a margin to areas of woodland, and as scrub planting. The purpose of woodland edge is to integrate these areas into the surrounding landscape while also providing a valuable resource for wildlife.
Native Shrub Planting	Native Shrub Planting (LE 3.2) species have been proposed to soften the road landscape, provide visual screening and replace vegetation lost to the Scheme. They are also intended to provide an increase in visual amenity and enhance the sense of gateway/entrance in strategic areas across the Scheme.
Groundcover/ Shrubs	Intended to provide an increase in visual amenity and enhance the sense of gateway/entrance in strategic areas across the Scheme. Groundcover/shrubs are to be established to create a sense of place and add seasonal interest around these gateway areas while also enriching the biodiversity of the landscape (similar to LE3.1 Ornamental amenity shrub mix with ground cover).
Native species hedgerows with trees	Native species hedgerows with trees (LE 4.4) will provide visual screening as well as valuable habitat and food source for local wildlife.
Individual trees	Individual trees (LE5.1) provide an additional layer of vegetation and structure within the landscape as well as screening views.
Marginal planting	Marginal planting (LE 6.1) will provide habitat with a diversity of species along the water's edge of the 10 balancing ponds. Reedbed is proposed in the Hanson Restoration area.
Wetland meadow	Wetland meadow (LE 6.4) within the boundaries of the 10 balancing ponds will provide additional species of grass and flowers within the Scheme.

Enhancement	Key landscape elements (LE)*
Sedum Blanket	Sedum blanket (LE 3.3) will be used at the Thames Crossing Bridge and also at the Appleford Railway Sidings Crossing, which will provide a green planted carpet to help mitigate the visual effects of the bridge structures.
Acoustic Barriers with climbing vegetation	Climbing vegetation will be provided at selected acoustic barrier locations to provide visual mitigation from the Scheme.

*** = Landscape elements as in** Design Manual for Roads and Bridges (DMRB) LD117 Landscape Design

4.3 During construction there will be impacts on wetland habitats associated with the Hanson Restoration Scheme (also known as the Bridge Farm quarry) due to crossing and displacement, e.g. for the Didcot to Culham River Crossing, and, in certain situations, shading by embankment and viaduct piers, namely:

a. areas of standing water and reed beds and reed fringes in the Culham finger lakes;
b. wet woodland occupying slightly higher ground rising out on the fingers, and at the higher western ends of those fingers that remain above winter flood levels, namely areas of existing tree and scrub vegetation;
c. dry lake margins intended to be managed as wet flower-rich grassland approximating to MG4/MG5 grassland, interspersed with clumps of tree along shorelines; and
d. areas of standing water.

4.4 Additionally, approximately 19% (0.7ha) of the unnamed lake at the Appleford Siding, together with parts of three ponds, will be lost through the Scheme. The unnamed lake supports European Eel, Bullhead and nine other fish species, and habitat will be lost for these species.

4.5 Compensatory habitat creation and replacement will ensure that at least like-for-like habitat is created in line with the Hanson Restoration Scheme and for the unnamed lake. The former will include riparian enhancement along the corridor between the Culham finger lakes and the River Thames, including the planting of marginal trees and riparian vegetation, and the reconfiguration of proposed habitats in the Hanson Restoration Scheme area (see the LBMP).

4.6 During the operation phase, the effects of increased shading on the Culham finger lakes and the unnamed lake will be negligible. In the case of the Culham finger lakes, this is due to the alignment of the viaduct (north - south) and the width and height (approximately 4 metres above ground level in the centre of each span) of the viaduct in relation to the size of the water body. Nevertheless, areas of reedbed and other habitats in the Hanson Restoration Area may need to be relocated away from the viaduct, piers and embankment to maintain the equivalent total habitats within the area. In the case of the unnamed lake, there are no aquatic macrophytes to shade, although a reduction in algae in the water due to shading may allow some shade tolerant aquatic macrophytes to benefit.

4.7 Based on high-level conversations between the Applicant and Hanson, the currently approved restoration plan for the Hanson Restoration Scheme (Bridge Farm quarry) would be amended following the approval of the HIF 1 Scheme. The Applicant would work with Hanson to amend the restoration scheme to meet Hanson's and the Applicant's requirements. A Section 73 application would be submitted by Hanson to amend the Hanson Restoration Scheme, once a way forward has been agreed and the detail worked out.

4.8 An OEMP (Appendix 4.2 of the ES, see ES Addendum April 2023) has been prepared for the Scheme to manage any environmental effects of the Scheme and to demonstrate

compliance with environmental legislation. The Principal Contractor (PC) will prepare a CEMP which will be based on, and incorporate, the content and requirements of the LBMP and OEMP as necessary.

4.9 The combination of the LBMP and OEMP will ensure that enhancements to biodiversity designed into the Scheme along with measures to avoid, mitigate and compensate biodiversity features will be implemented and that a minimum biodiversity net gain of 10% will be attained.

5 CONCLUSION AND SUMMARY OF TECHNICAL NOTE

5.1 This technical note has explained the implications of the Scheme with respect to:

5.1.1 bats roosts;

5.1.2 biodiversity; and

5.1.3 habitat restoration and in particular the Hanson Restoration scheme (also known as the Bridge Farm restoration).

5.2 There are currently no bat roosts that will be impacted either directly or indirectly by the Scheme and there is no necessity to apply to Natural England for any licence.

5.3 The Scheme meets the aspiration to achieve at least a net gain of 10% in biodiversity for habitat, hedgerow and river units.

5.4 The combination of the Landscape and Biodiversity Management Plan, Outline Environmental Management Plan and the Construction Environmental Management Plan will ensure that enhancements to biodiversity designed into the Scheme along with measures to avoid, mitigate and compensate biodiversity features will be implemented and that a minimum biodiversity net gain of 10% will be attained.

PAUL MAXWELL WADE, BSc (Hons), PhD, FCIEEM, CEcol

30 January 02024

Appendix AM2.5 EA comments June 2023

Comments received from the Environment Agency in June 2023 that confirm their objection on biodiversity grounds is removed following inclusion of planning conditions.

creating a better place

Environment Agency

Ms Emily Catcheside
Oxfordshire County Council
Planning Implementation
County Hall New Road
Oxford
Oxfordshire
OX1 1ND

Our ref: WA/2021/129485/03-L01
Your ref: R3.0138/21

Date: 02 June 2023

Dear Ms Catcheside

The dualling of the A4130 carriageway (A4130 widening) from the Milton Gate junction eastwards, including the construction of three roundabouts; - a road bridge over the great western mainline (Didcot Science Bridge) and realignment of the A4130 north east of the proposed road bridge including the relocation of a lagoon; - construction of a new road between Didcot and Culham (Didcot to Culham River Crossing) including the construction of three roundabouts, a road bridge over the Appleford railway sidings and road bridge over the river Thames; - construction of a new road between the B4015 and A415 (Clifton Hampden bypass), including the provision of one roundabout and associated junctions; and - controlled crossings, footways and cycleways, landscaping, lighting, noise barriers and sustainable drainage systems

Land between Didcot to Clifton Hampden

Thank you for re-consulting us on the above application following the submission of additional details. We have reviewed the applicant's Regulation 25 Response (April 2023), the applicant's response to Environment Agency BNG comments (April 2023) and the amended landscape masterplan.

In our previous response, we stated our concerns that insufficient attempt to provide enhancements throughout the scheme on local watercourses within the application area had been provided.

Having considered the additional information submitted, we acknowledge the constraints the applicant has outlined in relation to watercourse enhancements in areas beyond their control. While we remain disappointed that additional physical improvements to the Moor Ditch have not been forthcoming, we recognise that landscape and biodiversity enhancements are being proposed including protection and enhancement of water features where feasible; a small biodiversity net gain in river units; off-site compensation; protection and enhancement of areas along the river

Did you know the Environment Agency has a **Planning Advice Service**? We can help you with all your planning questions, including overcoming our objections. If you would like our help please email us at planning_THM@environment-agency.gov.uk

Thames, alongside additional landscaping measures as now proposed within the revised landscape masterplan. On balance, while we remain disappointed that further enhancements to local watercourses are absent from the proposal, we acknowledge that the applicant has done enough to satisfy the majority of policy requirements and therefore withdraw our outstanding objection.

Environment Agency position
The proposed development will be acceptable if the following conditions are included on the planning permission's decision notice. Without these conditions we would object to the proposal due to its adverse impact on the environment.

As you are aware, the discharge and enforcement of planning conditions rests with your authority. You must therefore be satisfied that the proposed conditions meet the requirements of the 6 tests in paragraph 56 of the National Planning Policy Framework.

Please notify us immediately if you are unable to apply our suggested conditions to allow further consideration and advice.

Condition 1
The development shall be carried out in accordance with the submitted flood risk assessment (Didcot Garden Town HIF 1 Scheme Environmental Statement Volume III Appendix 14.1: Flood Risk Assessment (FRA) September 2021 by AECOM Limited) and the following mitigation measures it details:

- Table 4.1: Mitigation measures proposed for the Didcot to Culham River Crossing
- Table 4.4: Mitigation measures proposed for Moor Ditch and tributaries
- Table 4.6: Mitigation measures proposed for Clifton Hampden Bypass

And mitigation measures shown in the accompanying technical notes:

- Flood Risk Technical Note by AECOM dated 20 July 2022
- Flood Risk Technical Note: Additional Information Addendum by AECOM, reference RIV_PD-ACM-EWE-SW_ZZ_ZZ_ZZ-TN-FR-0002, dated 08/12/2022

These mitigation measures shall be fully implemented and subsequently in accordance with the scheme's timing/ phasing arrangements. The measures detailed above shall be retained and maintained thereafter throughout the lifetime of the development.

Reason(s)
To ensure the development remains safe and to prevent flooding elsewhere by ensuring that compensatory storage of flood water and flood mitigation is provided. This is in line with paragraph 167 of the National Planning Policy Framework.

Condition 2
No development shall take place until such time as a scheme for level for level compensatory storage, has been submitted to, and approved in writing by, the planning authority. The scheme shall include measures to identify how the compensatory storage and any altered or proposed culverts will be inspected and maintained throughout the lifetime of the development.

The approved scheme shall be fully secured, implemented, and subsequently maintained, in accordance with the scheme's timing/phasing arrangements, or within any other period as may subsequently be agreed, in writing, by the planning authority

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throughout the lifetime of the development.

Reason(s)
To ensure that there are no detrimental impacts to flood storage or flood flow routes. This is in line with paragraph 167 of the National Planning Policy Framework.

Note to planning authority: The submission has shown that level for level compensatory storage can be provided. This condition is required to ensure changes made at the detailed design phase of the Scheme are captured and secured.

Condition 3
If, during development, contamination not previously identified is found to be present at the site then no further development (unless otherwise agreed in writing with the local planning authority) shall be carried out until a remediation strategy detailing how this contamination will be dealt with has been submitted to, and approved in writing by, the planning authority. The remediation strategy shall be implemented as approved.

Reason(s)
To ensure that the development does not contribute to and is not put at unacceptable risk from or adversely affected by unacceptable levels of water pollution from previously unidentified contamination sources at the development site. This is in line with paragraph 174 of the National Planning Policy Framework.

Condition 4
No drainage systems for the infiltration of surface water to the ground are permitted other than with the written consent of the planning authority. Any proposals for such systems must be supported by an assessment of the risks to controlled waters. The development shall be carried out in accordance with the approved details.

Reason(s)
To ensure that the development does not contribute to and is not put at unacceptable risk from or adversely affected by unacceptable levels of water pollution from previously unidentified contamination sources at the development site. This is in line with paragraph 174 of the National Planning Policy Framework.

Condition 5
No development shall take place until a Construction Environment Management Plan (CEMP) is submitted to and approved in writing by the Planning Authority.

The CEMP shall include the following elements:

- Measures to be employed to avoid or reduce impacts on species and habitats and to avoid peak fish migration and spawning seasons
- Details of fish rescue and translocation
- Pollution control measures
- Bio security measures to prevent the spread of invasive species
- Timing of the works across the river Thames
- Timing of and proposed scope of contact with Environment Agency waterways officers through the period of works adjacent to and across the river Thames
- Details of any proposed restriction to the width or navigable height of the river Thames
- Details of any proposed restriction or closure of navigation of the river Thames
- Details of any barges, floating plant or other vessels to be used during the works adjacent to and across the river Thames

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- Measures to be employed during construction adjacent to and across the river Thames to minimise environmental impacts (considering both potential disturbance and pollution)
- Details of measures to ensure any damage or disturbance to the towpath, banks or riverbed of the river Thames will be repaired following completion of the works

Reason(s)
To ensure that the development protects the natural environment and is prevented from contributing to unacceptable levels of pollution. This is in line with paragraph 174 of the National Planning Policy Framework.

Condition 6
No development shall take place until a landscape and ecological management plan, including long-term design objectives, management responsibilities and maintenance schedules for all landscaped areas, has been submitted to, and approved in writing by, the local planning authority. The landscape and ecological management plan shall be carried out as approved and any subsequent variations shall be agreed in writing by the local planning authority.

The scheme shall include the following elements:

- details of maintenance regimes
- details of any new habitat created on-site
- details of treatment of site boundaries and/or buffers around water bodies
- details of management responsibilities

Reason(s)
To ensure that the development protects the natural environment and delivers biodiversity enhancement. This is in line with paragraph 174 and 180 of the National Planning Policy Framework.

Advice to Planning Authority

Sequential test
What is the sequential test and does it apply to this application?
In accordance with the National Planning Policy Framework (paragraph 162), development in flood risk areas should not be permitted if there are reasonably available alternative sites, appropriate for the proposed development, in areas with a lower risk of flooding. The sequential test establishes if this is the case.
Development is in a flood risk area if it is in Flood Zone 2 or 3, or it is within Flood Zone 1 and your strategic flood risk assessment shows it to be at future flood risk or at risk from other sources of flooding such as surface water or groundwater.

The only developments exempt from the sequential test in flood risk areas are:

- Householder developments such as residential extensions, conservatories or loft conversions
- Small non-residential extensions with a footprint of less than 250sqm
- Changes of use (except changes of use to a caravan, camping or chalet site, or to a mobile home or park home site)
- Applications for development on sites allocated in the development plan through the sequential test, which are consistent with the use for which the site was allocated.

Avoiding flood risk through the sequential test is the most effective way of addressing

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flood risk because it places the least reliance on measures such as flood defences, flood warnings and property level resilience.

Who undertakes the sequential test?
It is for you, as the local planning authority, to decide whether the sequential test has been satisfied, but the applicant should demonstrate to you, with evidence, what area of search has been used. Further guidance on the area of search can be found in the planning practice guidance here .

What is our role in the sequential test?
We can advise on the relative flood risk between the proposed site and any alternative sites identified - although your strategic flood risk assessment should allow you to do this yourself in most cases. We won't advise on whether alternative sites are reasonably available or whether they would be suitable for the proposed development. We also won't advise on whether there are sustainable development objectives that mean steering the development to any alternative sites would be inappropriate. Further guidance on how to apply the sequential test to site specific applications can be found in the planning practice guidance here.

Exception test
The exception test should only be applied as set out in flood risk table 3 of the Planning Practice Guidance (PPG) following application of the sequential test. The exception test should not be used to justify the grant of planning permission in flood risk areas when the sequential test has shown that there are reasonably available, lower risk sites, appropriate for the proposed development.

In those circumstances, planning permission should be refused, unless you consider that sustainable development objectives make steering development to these lower risk sites inappropriate as outlined in PPG (ref ID: 7-033-20140306).

Our role in the exception test
The exception test is in two parts, described in the NPPF (paragraph 164). In order for the test to be passed it must be demonstrated that

1. The development would provide wider sustainability benefits to the community that outweigh flood risk; and

2. The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Paragraph 165 of the NPPF makes clear that both parts need to be met for the test to be satisfied. It is for the applicant to demonstrate this.

We provide advice on the second part of the test, but it is for you, as the local planning authority, to consider the first part of the test, accounting for the findings of the flood risk assessment and our flood risk advice, and to determine whether the test, overall, has been satisfied. Development that does not satisfy both parts of the exception test should be refused.

Where the flood risk assessment shows the development will be safe throughout its lifetime without increasing flood risk elsewhere
Even where a flood risk assessment shows the development can be made safe throughout its lifetime without increasing risk elsewhere, there will always be some

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remaining risk that the development will be affected either directly or indirectly by flooding. You will need to weigh these risks against any wider sustainability benefits to the community.

Flood warning and emergency response
We do not normally comment on or approve the adequacy of flood emergency response procedures accompanying development proposals, as we do not carry out these roles during a flood. Our involvement with this development during an emergency will be limited to delivering flood warnings to occupants/users covered by our flood warning network.

The planning practice guidance (PPG) to the National Planning Policy Framework states that, in determining whether a development is safe, the ability of residents and users to safely access and exit a building during a design flood and to evacuate before an extreme flood needs to be considered. One of the key considerations to ensure that any new development is safe is whether adequate flood warnings would be available to people using the development.

In all circumstances where warning and emergency response is fundamental to managing flood risk, we advise local planning authorities to formally consider the emergency planning and rescue implications of new development in making their decisions. As such, we recommend you refer to 'Flood risk emergency plans for new development' and undertake appropriate consultation with your emergency planners and the emergency services to determine whether the proposals are safe in accordance with paragraph 167 of the NPPF and the guiding principles of the PPG.

Advice to Applicant

Other permits and licences

Flood Risk Activity Permit
The Environmental Permitting (England and Wales) Regulations 2016 require a permit or exemption to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- In the floodplain of a main river if the activity could affect flood flow or storage and potential impacts are not controlled by a planning permission

For further guidance please visit https://www.gov.uk/guidance/flood-risk-activities-environmental-permits or contact our National Customer Contact Centre on 03708 506 506 (Monday to Friday, 8am to 6pm) or by emailing enquiries@environment-agency.gov.uk.

The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

Accommodations Licence
The Environment Agency is the navigation authority for the River Thames, a public river

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regulated by statute. Successive Thames Conservancy Acts have declared it unlawful for any person to install an accommodation in or over the public river without a licence from us.

The proposed development will need an Accommodations Licence under Section 60 of the Thames Conservancy Act 1932. Enquiries can be sent by email to THAMESACCOMS@environment-agency.gov.uk.

For further guidance please visit River Thames: accommodation licensing requirements - GOV.UK (www.gov.uk).

Closing comments
In accordance with the planning practice guidance (determining a planning application, paragraph 019), please notify us by email within two weeks of a decision being made or application withdrawn. Please provide us with a URL of the decision notice, or an electronic copy of the decision notice or outcome.

Should you require any additional information, or wish to discuss these matters further, please do not hesitate to contact me on the number below.

Yours sincerely

Miss Sarah Green
Sustainable Places - Planning Advisor

Direct dial 0208 474 9253
Direct e-mail planning_THM@environment-agency.gov.uk

End

Appendix AM2.6 Rapid Health Impact Assessment Review Checklist signpost document

A document produced by the Applicant for the LPA, which outlines how health has been taken into account in the Environmental Statement.

OXFORDSHIRE HEALTH IMPACT ASSESSMENT

Rapid HIA Review Checklist:
Didcot Garden Town HIF 1 Scheme
Environmental Statement – Volume I

Chapters reviewed
Chapter 13: Population and Human Health
Chapter 6 Air Quality
Chapter 10: Noise and vibration

	CRITERIA	GRADING ADEQUATE (A) FURTHER INFORMATION NEEDED (F) INADEQUATE (I)	COMMENTS • WHAT'S MISSING? • ARE THERE ANY WEAKNESSES/WHAT NEEDS STRENGTHENING? • WHAT'S HELPFUL OR COMPLETED WELL?
	Section 1: Description of the proposed development		
1.1	There is a clear description of the project being assessed including: • Aims and objectives of the proposed development; • Physical characteristics of the site of the proposed development and surrounds; • Characteristics of the proposed development once operational; and • Timescales and durations of the construction and operational phases of the proposed development.	A	Chapter 13 of the Environmental Statement considers the potential impacts of the Scheme on community health and wellbeing.
1.2	Policy context for the project has been set out, noting any relevant health and wellbeing policies.	A	Yes – relevant sections of NPPF, PPG and local planning policies. The population and human health assessment has been undertaken in accordance with the following guidance: □ DMRB LA 104: Environmental assessment and monitoring (Ref 13.17); and □ DMRB LA 112: Population and human health (Ref 13.16).
	Section 2: Identification of population groups affected by the development		

	CRITERIA	GRADING ADEQUATE (A) FURTHER INFORMATION NEEDED (F) INADEQUATE (I)	COMMENTS • WHAT'S MISSING? • ARE THERE ANY WEAKNESSES/WHAT NEEDS STRENGTHENING? • WHAT'S HELPFUL OR COMPLETED WELL?
2.1	A process to identify groups of the population likely to be affected by the proposed development has been undertaken.	A	e.g. With the exception of Sandford and the Wittenhams, which has a childhood obesity prevalence of 20.4%, the prevalence of childhood obesity in the 2018 electoral wards within the study area aligns with VoWHDC and SODC and hence is well below the national average. Over the 5-year period between 2013/14 and 2017/18 (Ref 13.22) hospital admissions for COPD in VoWHDC and SODC were significantly lower than the national average (100.0 standardised admission ratio8 (SAR)). With the exception of Sandford and the Wittenhams, which had an emergency hospital admission for COPD SAR of 107.7, the rates of emergency hospital admissions for COPD across the 2018 electoral wards were well below the national average. SMRs for deaths by respiratory diseases in the 2018 electoral wards of Didcot West (122.1) and Sandford and the Wittenhams (142.8) are above the national average (100.0) Dat for life expectancy not healthy life expectancy. Provided data on deprivation – none of the LSOAs are in the most deprived 10%
2.2	Evidence to support the inclusion of identified groups has been provided, this might be presented as a Population Profile and could include quantitative and qualitative information.	A	WCH National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient WCH route. Little/ no potential for substitution. Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs PRoW and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys,
	Section 3: Identification of geographical area and associated health priorities		

	CRITERIA	GRADING ADEQUATE (A) FURTHER INFORMATION NEEDED (F) INADEQUATE (I)	COMMENTS • WHAT'S MISSING? • ARE THERE ANY WEAKNESSES/WHAT NEEDS STRENGTHENING? • WHAT'S HELPFUL OR COMPLETED WELL?
3.1	A process to identify the geographical scope of the assessment has been undertaken.	A	The study area has been defined as the extent of land within the Site boundary and an area extending 500 m beyond those limits (the 500 m study area). Where likely impacts of the Scheme are identified beyond the 500 m study area, the affected receptors have been included within the baseline assessment and assessment of effects. The human health study area aligns with the study area outlined for land use and accessibility impacts. In addition to this area, a population-level baseline study area is appropriate due to the availability of human health data across the local authorities and wards that will be affected by the Scheme. Accordingly, the following local authority administrative areas comprise the human health study area: □ VoWHDC; and □ SODC. Scheme specific human health impacts, such as the closure of PRoW, have only been identified within the 500 m study area. Within the human health assessment, specific wards are referenced to provide a more localised analysis of human health indicators. Serious road traffic incidents within 2 km of the Site boundary have been analysed to build an understanding of road network safety
3.2	Health priorities for the affected geographic scope are identified for inclusion in the assessment. Any additional priority themes are also identified for inclusion should they be considered relevant.	A	The following key aspects of human health have been considered: • Access to and severance from community facilities, education facilities, • recreational facilities and health facilities; • Access to and severance from open space, green space, blue space and play • space; • Use of Walking, cycling and horse riding routes; • Air quality • Noise and vibration.

	CRITERIA	GRADING ADEQUATE (A) FURTHER INFORMATION NEEDED (F) INADEQUATE (I)	COMMENTS • WHAT'S MISSING? • ARE THERE ANY WEAKNESSES/WHAT NEEDS STRENGTHENING? • WHAT'S HELPFUL OR COMPLETED WELL?
	Section 4: Assessment of health		
4.1	**Baseline**		
4.1.1	There should be a narrative which interprets the data collected in the context of the HIA.	A	A qualitative assessment of human health has been undertaken in accordance with LA 112 (Ref 13.16). This has involved establishing the sensitivity of a community/ population based on a health profile developed within a defined human health study area (see Section 13.5.9), and reporting this on a scale of low, medium or high.13.4.26 Changes to health determinants as a result of the Scheme have been identified and determined using information from other assessments undertaken as part of the EIA of the Scheme, for example the air quality and the noise and vibration assessment.13.4.27 The likely health outcomes1 as associated with the Scheme have been identified in line with the categories outlined in Table 13.7, based on the sensitivity of a community/ population and changes to health determinants likely to occur as a result of the Scheme.
4.1.2	The HIA uses robust data sources which could include other key environmental or technical specialists involved in the proposed development	A	Relevant data sources have been referenced, including: Baseline health information received from EHOs– to inform the assessment of effects on human health; □ Public data sources including Public Health England (PHE) and the Office for National Statistics (ONS) – to determine existing health conditions in the health baseline study area; □ Walking, Cycling and Horse-Riding Assessment and Reviews The 2018 electoral wards analysed as part of this baseline include Drayton, Blewbury and Harwell, Didcot West, Didcot North East, Sutton Courtenay, and Sandford and the Wittenhams. Table 13.21 presents human health statistics
4.2	**Evidence**		
4.2.1	The sources of evidence used are relevant to the project and scale of the HIA.	A	
4.2.2	Evidence and data sources used are clearly referenced.	A	
4.2.3	The quality and depth of evidence is sufficient to inform the assessment of likely impacts.	A	
4.2.4	There is some critical assessment of the literature used.	N/A	
4.2.5	Any limitations of the evidence collected are highlighted and a rationale provided.	N/A	

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4.3	**Stakeholder Engagement**		
4.3.1	Evidence of discussion with the appropriate Local Authority Officer to agree a proportionate approach to stakeholder engagement is provided, and this approach has been followed.	A	EHOs and PROW. No public health engagement but not in initial scope
4.3.2	The report identifies all stakeholder groups relevant to the health assessment for the proposed development.	A	A public consultation was held from 20th March to 30th April 2020 on the feasibility design of the Scheme. Relevant WCHAR stakeholders were sent a targeted questionnaire to capture their views on the feasibility designs and needs of the users they represent.
4.3.3	The range of stakeholders and the variety of groups that were engaged has been recorded.	A	
4.3.4	The methods of engagement were appropriate, and their effectiveness evaluated.	A	
4.3.5	There is evidence that information gathered from stakeholders has been used to inform and influence the assessment.	A	e.g. The Didcot to Culham River Crossing Scheme section has been designed, where possible, further to the west of Appleford village. This will reduce the potential for both noise and air quality impacts at sensitive residential receptors in Appleford Village and at Zouch Farm.
4.4	**Health effects**		
4.4.1	Any positive impacts, or opportunities to maximise health and wellbeing outcomes, are identified and how they were identified is presented clearly.	A	Noise Impacts Air Quality Impacts Mobility Impacts **Road Safety** the improvements being made to the road network within the study area, the Scheme is anticipated to improve road safety for both vehicular travellers and for WCHs.
4.4.2	Any negative impacts, gaps or unintended consequences are identified and how they were identified is presented clearly.	A	
4.4.3	It is made clear how each impact identified is supported by the evidence gathered. The strength and sources of evidence for each impact is clearly communicated.	A	
4.4.4	It is clear who will be impacted, with affected populations explicitly identified, and any potential inequalities in the distribution of impacts are identified.	A	
4.5	**Summary**		

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4.5.1	A conclusion is provided summarising the key outcomes and messages from the assessment, any recommendations to manage health effects, and supporting evidence.	A	
4.5.2	Any recommendations for further action identify who is responsible for taking forward the action.		See below

Conclusions of the reviewer:

Didcot Garden Town HIF 1 Scheme
Environmental Statement – Volume I

The public health team have reviewed the following chapters in the environmental statement in order to assess the impact of the scheme on human health and wellbeing:

- Chapter 13: Population and Human Health
- Chapter 6 Air Quality
- Chapter 10: Noise and vibration

It is noted that at the time of the scoping review for the environmental impact assessment in 2020, there was no requirement for a separate Health Impact Assessment to be undertaken of major infrastructure schemes. However, the relevant chapters in the environmental statement provide sufficient information for an assessment of the impacts of the scheme, positive, negative and neutral, on health and wellbeing. Our comments address the impact of the scheme on the following:

- Air Quality
- Noise and Vibration
- Physical Activity
- Access to nature, green and blue spaces
- Connectivity and climate impact

Air Quality
The applicant confirms that there are no AQMAs within the study area, although there are potentially some concerns about neighbouring areas such as the Abingdon AQMA (3 miles away). The AQA identifies sensitive receptors and states that these were chosen based on the areas where pollutant concentrations were likely to be highest. As no receptors are predicted to experience an exceedance of the objective for annual mean NO2, a conclusion of no likely significant air quality effects is recorded for the construction traffic impacts. However, due to the scale of the Scheme and the presence of public exposure receptors close to the Site boundary, e.g., residential properties and education facilities, there is potential for adverse air quality effects during the construction of the Scheme in relation to construction dust and plant equipment. Proposed mitigation measures must be implemented in full – see below.

Noise and Vibration

The Scheme will result in changes to the levels of traffic congestion on the road network through the redistribution of traffic. The assessment provides detailed information on how the redistribution of traffic will change the air quality and ambient noise environments at different receptors across the study areas resulting in a positive, negative or neutral outcome on the health of local communities. The assessment concludes that in total, 187 residential buildings in the study area are anticipated to experience a minor, moderate or major increase in traffic noise levels in the opening year, and 1,862 a decrease, based on the façade with the greatest magnitude of change. There will remain a number of properties which will experience a significant adverse impact from this scheme but will not benefit from the Noise Insulation Regulations 1975.

Given that one of the receptors is negatively affected both during the construction and operational phases is a nursery, additional information is requested to identify any additional mitigations that are possible to reduce adverse impacts on air quality and noise in the short and long term.

Mitigations
During the construction phase, a number of properties have been identified that will suffer Significant Observable Adverse Effect and vibration annoyance. A Construction Environmental Management Plan (CEMP) is mentioned as a way of minimising any air quality related effects of the dust and to reduce noise and vibration impact generated during construction. Given that the population health assessment has identified that a number of sensitive receptors will be adversely impacted during the construction phase, it is essential that effective monitoring is undertaken to ensure that the Noise and Vibration Management Plan (NVMP) and the Dust Management Plan are being fully implemented and adhered to in order to mitigate potential noise and vibration impacts.
It is recommended that the results of surveys including physical measurements and observational checks and audits to ensure that BPM should be publicly accessible.

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	Physical Activity The Scheme will provide new footpaths/ cycleways and aims to improve safety along the road. In order to maximise use of this cycling and walking infrastructure, trees, shrubs and hedges should visually separate the road from the cycle and pedestrian paths alongside the road. *It is recommended that current levels of planting need to be enhanced to make this cycling and walking environment more attractive and to ensure that the local population increase active travel and participation in recreational activities.* It is noted that temporary closure of multiple sections of PRoW will reduce the amount of opportunities to undertake physical exercise. *In order to minimise the negative outcomes on health during the construction phase, clear signage of rerouting of PRoWs and advance publicity regarding these changes is essential.* **Access to natural green and blue spaces** Access to green and public space is important for both physical health and mental wellbeing. Construction of this scheme will result in the loss of over 50,000m2 tree cover and no detail is provided relating to the impact on hedgerows and other planting. In addition, although green infrastructure is mentioned as a way of mitigating air pollution, the applicant does not provide any detail as to how any proposed green infrastructure will affect air quality. *It is recommended that the level of planting is enhanced in order to minimise adverse impacts on biodiversity, improve air quality and encourage use of new active travel infrastructure.* **Connectivity and climate change mitigation** This proposal will deliver key transport infrastructure, relieve congestion and improve connectivity and will support new housing and employment growth. As such it has the potential to improve human health. It is noted that where temporary or permanent access to private property or housing, community land and assets including open space and nature; community recreational and healthcare infrastructure as well as development land, and businesses, is severed as a result of the Scheme, appropriate alternative temporary or permanent access will be provided. *In order to ensure that the scheme positively mitigates against climate change it is important that the scope and biodiversity of planting is maximised.*		

Noise Assessment

Key Measure: Noise pollution caused by traffic (during both construction and operation)

Consideration	Grading	Comment
Baseline Include a description of the baseline as applicable to the theme, likely to include; • Proximity and location of noise agglomerations and potential sources of noise; • Current levels of traffic and congestion; Sources likely to include Noise Action Plans26 , Defra Air Quality Background maps27, Department of Transport traffic count data28 , England Noise and Air Quality Viewer29	A	The Noise and Vibration Assessment identifies relevant national and local policy and standards that seek to ensure that new development does not impact adversely on health and wellbeing. The assessment identifies 21 relevant sensitive receptors and considers the impact of construction and operational noise on them. This includes residential properties, nurseries, schools, places of worship and community centres and health centre. It is appropriate that the assessment has focussed on a selection of the closest identified potentially sensitive receptors, the reported impacts are, therefore, typical of the worst affected receptors such that all potentially significant effects have been identified. ES Chapter 10: Noise and Vibration identifies likely significant adverse noise and vibration effects during construction at the following receptors: □ Premier Inn Hotel at the Milton Interchange; □ New Farm by the A4130; □ Valley Park; □ Great Western Park; □ Hill Farm, Hartwright House and Level Crossing Cottage between Didcot and Appleford; □ The western edge of Appleford (Main Road, south, and Chambrai Close); □ A single property to the north west of Appleford; □ The east of Sutton Courtenay; □ Zouch Farm; □ Culham Station; □ Fullamoor Barns, Fullamoor Cottages and two further cottages to the east; □ Culham Science Centre Nursery and Preschool; □ The northern edge of Clifton Hampden; and

		Two properties to the north of Clifton Hampden. No END quiet areas or potential END quiet areas have been identified in the study area, similarly no 'tranquil areas' as referred to in the NPPF have been identified. However, publicly accessible open spaces, which may be prized for their recreational and amenity value, have been identified based on the national OS green space and Parks and Gardens data sets and Local Authority 'accessible countryside' areas. Two 'Noise Important Areas' (NIA) (those areas most exposed to noise) for road noise and one for rail noise were identified in round three of the DEFRA noise mapping in the study area. The two road noise NIAs are located on the A415 in Clifton Hampden to the west of the junction with Watery Lane (ID 13243) and on the A34 to the south of the junction with the A4130 at Milton Interchange (ID 4187). Regarding the NIA on the A34, responsibility lies with Highways England, the NIA on the A415 is the responsibility of OCC.
• Inclusion of design measures that minimise the impact of noise	A	Low noise surfacing, noise barriers and scheme alignment have been proposed to reduce adverse impacts from noise. However, there is a need to consider the design of such barriers, in sensitive locations such as Clifton Hampden, a conservation area.
Inclusion of mitigation measures during construction		As part of the CEMP a specific Noise and Vibration Management Plan (NVMP) will be developed. It is noted that the NVMP will includes relevant noise criteria, proposed surveys and a range of range of Best Practicable Means (BPM) associated with mitigating potential noise and vibration impacts. It is also noted that surveys will be required which will include physical measurements and observational checks and audits to ensure that BPM are being employed at all times.

• Proximity and location of Noise Action Important Areas (NIAs) and noise agglomerations		Acoustic Barriers: There are no detailed updates to proposed mitigation now that the Farmhouse has been included within the assessment. The proposed acoustic noise barrier to the west of the Clifton Hampden and the edge of the village conservation area does not appear to be supported by justification or alternatives that would have less potential visual impact. These could be improved with further design consideration.
Landscape design of development, tree cover and green infrastructure		A dark green acoustic barrier on the bridge will be viewed against the sky and will stand out making it more intrusive. The proposed 3m high acoustic barriers beside the road leading from Didcot to the River Thames Crossing are likely to be visually intrusive.
Proximity of residential units to industrial uses or uses generating late night noise can cause nuisance		N/A
Potential improvement to health and wellbeing		The Scheme results in reductions in traffic noise levels along existing roads which are bypassed by the Scheme including individual properties along the existing minor roads to the east and west of the Scheme through the villages of Sutton Courtenay, Culham and Long Wittenham, and the A415 east of Culham Station and the A415 and B4015 in Clifton Hampden. In addition, the Scheme results in a reduction in traffic noise east of Clifton Hampden through the village of Burcot, and in the centre of Appleford at facades of properties facing onto the B4016, both of which experience a reduction in traffic with the Scheme in operation.
Conclusions		The Scheme will result in changes to the levels of traffic congestion on the road network through the redistribution of traffic. The redistribution of traffic will change the air quality and ambient noise environments at different receptors across the study area (see ES Chapter 6: Air Quality and ES Chapter 10: Noise and Vibration). This will result in a positive, negative or neutral outcome on the health of local communities.

		A number of sensitive receptors that will benefit from a decrease in noise level (181 in daytime, 126 at night) significantly higher than those with adverse impact (6 in daytime, 5 at night). In total, 187 (176+5+6) residential buildings in the study area are anticipated to experience a minor, moderate or major increase in traffic noise levels in the opening year, and 1,862 a decrease (1092+589+181), based on the façade with the greatest magnitude of change. In the short and long term the Premier Inn on the A4130 near Milton Interchange is anticipated to experience a moderate increase in both the daytime and night-time. In addition, the Culham Science Centre nursery is also anticipated to experience a moderate increase in the long term . Hill Farm & Hartwright House between Didcot and Appleford will experience a significant adverse impact due to the major increase in predicted noise. It is noted that they may qualify for noise insulation works under the Noise Insulation Regulations Aecom's response indicates that there is little further that can be done to mitigate the noise impacts of the proposed development. This suggests that there will remain a number of properties which will experience a significant adverse impact from this development but will not benefit from the Noise Insulation Regulations 1975. Given that one of the receptors affected is a nursery, additional information is requested to identify any additional mitigations are possible to reduce adverse impacts in the short and long term. The decision process will have to balance this negative impact against the benefits that the development is expected to bring.

Physical Activity

Key Measure: does the scheme promote physical activity

Consideration	Grading	Comment
Baseline Access to open space (including play space and sports facilities) Local authority area information from the Sport England Active Lives database (https://activelives.sportengland.org/) Ability to walk and cycle to work or other community facilities Access barriers (e.g. financial cost to participate or transport)	A	There are 31 PRoW routes which are made up of 65 PRoW sections with distinct route codes, located within the study area. The 65 PRoW sections comprise of 45 footpaths, 10 bridleways, eight byways with restricted traffic and two byways open to all traffic (BOAT). See also section on open spaces
Opportunities for physical activity	A	The cycle and pedestrian ways beside the roads are important in providing sustainable links between Didcot and villages to the north as well as linking the town and residential areas with employment sites at its northern and western edges. The Scheme provides new footpaths/ cycleways infrastructure, and improves safety along the road, which could encourage the local population to increase active travel and participation in recreational activities It is noted that temporary closure of existing PRoW is expected during the construction of the Scheme. The closure of multiple sections of PRoW will temporarily reduce the amount of opportunities to undertake physical exercise. The construction of the Scheme is therefore assessed to have a negative outcome on health in terms of physical activity.
Facilitated access to open and natural space	A	There are nine publicly accessible open spaces within

		the study area. The assessment identifies their distance from the site boundary, on site facilities and access points In addition to the publicly accessible open spaces identified in Table 13.10, the River Thames is an area of blue space. The River Thames, known alternatively in parts as the River Isis, is a river that flows through southern England including London. There are no recreational facilities such as boat hire or repair located on this section of the River Thames, however, this section is still used by private vessels for recreational activities. Recreational usage of the River Thames within the study area is identified in Table 13.25
Infrastructure (built and transport) that incentivises and supports physical activity	A	Trees and hedges should visually separate the road from the cycle and pedestrian paths alongside the road. The planting comprising shrub planting and occasional trees is weak and will not achieve the aims above or the expectation in paragraph 131 of the NPPF that streets should be tree lined
Opportunities for leisure activities including informal activities such as gardening or food growing	A	See above and the assessment identified 8 recreational facilities within the study area
Conclusion		The Scheme will provide new footpaths/ cycleways infrastructure, and aims to improve safety along the road. In order to maximise use of this cycling and walking infrastructure, trees, shrubs and hedges should visually separate the road from the cycle and pedestrian paths alongside the road. *It is recommended that current levels of planting need to be*

		enhanced to ensure that the local population increase active travel and participation in recreational activities It is noted that temporary closure of multiple sections of PRoW will reduce the amount of opportunities to undertake physical exercise. *In order to minimise the negative outcomes on health during the construction phase, clear signage of rerouting of PRoWs and advance publicity regarding these changes is essential.*

Access to Nature

Key measure: Does the scheme promote access to natural, ecologically functioning spaces, including water, grassland, woodland/trees?

Consideration	Grading	Comment
Baseline Functioning ecological nature network • Open space provision (including play space and sports facilities), accessible natural green space standards • Public rights of way, as well as other informal walking, cycling and horse riding routes • Population density • Distance to local accessible green space • Overcrowding • IMD – Living Environment Domain	A	
Accessibility to natural green and blue spaces and places	A	There will be over 50,000m2 more tree cover lost than planted. No figures are given for hedgerows, the loss and replacement of these should also be quantified. There has been very little increase in planting compared to the previous proposals. The opportunity to plant more woodland in line with the government's aim to plant more trees is lost
Consideration of community barriers to access		It is noted that where temporary or permanent access to private property or housing, community land and assets including open space and nature;

		community, recreational and healthcare infrastructure as well as development land, and businesses, is severed as a result of the Scheme, appropriate alternative temporary or permanent access will be provided.
Use/greening of existing built infrastructure		Trees and hedges should visually separate the road from the cycle and pedestrian paths alongside the road. The planting comprising shrub planting and occasional trees is weak and will not achieve the aims above or the expectation in paragraph 131 of the NPPF that streets should be tree lined
Design of existing environments including footpath and cycle ways to maintained green spaces and places		The A4130 needs to be tree and hedge lined with opportunities taken to plant trees in the central reservation. The proposals lack ambition in this respect. Tree and hedge planting will help screen the road in views from new housing on sites allocated for housing on the southern side of the A4130 and act as a noise buffer.
Temporary or permanent diversion and/or closure of walking, cycling or horse riding routes		It is noted that where temporary or permanent access to private property or housing, community land and assets including open space and nature; community, recreational and healthcare infrastructure as well as development land, and businesses, is severed as a result of the Scheme, appropriate alternative temporary or permanent access will be provided. Appropriate signage for all closures and diversion of PRoW will be used to inform pedestrians, equestrians and cyclists of changes with sufficient notice provided.
Conclusion		Access to green and public space is important for both physical health and mental wellbeing. Construction of this scheme will result in the loss of over 50,000m2 tree cover and no detail is provided relating to the impact on hedgerows and other planting. *It is recommended that the level of planting is enhanced in order to minimise adverse impacts on biodiversity and encourage use of new active travel infrastructure.*

Design

Key Measure: does the design promote connectivity, safety and address climate change, mitigation and delivery of net zero?

Consideration	Grading	Comment
Baseline		
The design, layout, delivery and maintenance of the scheme adopts measures to tackle the impacts of climate change e.g. use of SUDS as flood protection	FI	The proposals contain limited information on how SUDS will be designed including to benefit biodiversity. Further information is required in relation to these matters.
The scheme creates a safe environment which promotes good physical and mental health with routes which are both safe and perceived to be safe i.e. personal and traffic safety e.g. natural surveillance, speed restrictions in residential areas	A	Although note the need for enhanced planting to promote a sense of safety
Infrastructure enhances and protects connectivity between communities, destinations and places e.g. enhanced connectivity between homes, businesses and services, community spaces and the '20 minute neighbourhood'		This proposal will deliver key transport infrastructure, relieve congestion and improve connectivity and will support new housing and employment growth. The access to nine residential properties, which are all located off the A415 Abingdon Road, will change as a result of the Scheme but will increase the length of journey by less than a few minutes. As part of the Scheme, the current entrance to CSC will be replaced by a roundabout that better connects the entrance of the site to the A415 Abingdon Road and the new Clifton Hampden Bypass road. During construction it is expected that the existing level of access to the CSC will be maintained as far as is possible to do so, with temporary access points being provided where necessary. This may increase usual journey times by a few minutes for users of the site. No accessibility or

		severance issues have been identified for community, educational, recreational or health facilities as a result of the construction of the Scheme.
The scheme promotes social interaction between a wide range of users at different times e.g. connection between movement network and public spaces	A	It is noted that where temporary or permanent access to private property or housing, community land and assets including open space and nature; community, recreational and healthcare infrastructure as well as development land, and businesses, is severed as a result of the Scheme, appropriate alternative temporary or permanent access will be provided.
The scheme seeks to minimise adverse impacts on human health	A	The Scheme alignment has been designed to maintain or increase the distance between properties and traffic where possible. A key objective of the Scheme is to redistribute traffic away from local villages and sensitive receptors, to mitigate against noise and air quality impacts.
Conclusion		This proposal will deliver key transport infrastructure, relieve congestion and improve connectivity and will support new housing and employment growth. As such it has the potential to improve human health. It is noted that where temporary or permanent access to private property or housing, community land and assets including open space and nature; community, recreational and healthcare infrastructure as well as development land, and businesses, is severed as a result of the Scheme, appropriate alternative

		temporary or permanent access will be provided. *In order to ensure that the scheme positively mitigates against climate change it is important that the scope and biodiversity of planting is maximised.*

Air Quality

Key Outcome Measure – does the scheme impact adversely on air quality?

Consideration	Grading	Comment
Baseline Proximity and location of AQMAs Current levels of traffic congestion COPD and asthma indicators Sources likely to include DEFRA AQ information website and local authority monitoring reports	A	The AQA lists the AQMAs in South and Vale, of which Abingdon's AQMA is closest to, but not within, the study area (3km away). Culham Parish Council refer to Abingdon's AQMA in their comments, but the applicant restates the fact that the AQMA is outside of the study area. The AQA refers to sensitive receptors and states that these were chosen based on the areas where pollutant concentrations were likely to be highest. Current levels of traffic congestion The AQA does not refer to specific levels of traffic congestion in the study area but it does acknowledge that the construction of the proposed roads, bridges and roundabouts are partly intended to relieve unsustainable congestions between Clifton Hampden and Milton Interchange, thereby reducing emissions and the idling or slow-moving vehicles in heavy traffic. COPD and asthma indicators Details are provided in the population health chapter. Plenty of references to Defra and the AQA also mentions the fact that the districts use diffusion tubes to monitor air quality.

Air pollution caused by traffic both during construction and operations	A	The magnitude of change in NO2 concentrations due to construction traffic is predicted to be imperceptible at all selected public exposure receptors modelled for the construction phase. As no receptors are predicted to experience an exceedance of the objective for annual mean NO2, a conclusion of no likely significant air quality effects is recorded for the construction traffic impacts. **Current levels of traffic congestion** The AQA does not refer to specific levels of traffic congestion in the study area but it does acknowledge that the construction of the proposed roads, bridges and roundabouts are partly intended to relieve unsustainable congestions between Clifton Hampden and Milton Interchange, thereby reducing emissions and the idling or slow-moving vehicles in heavy traffic.
Provision of green infrastructure to protect sensitive receptors	FI	The AQA refers to NPPF which includes mention of the importance of green infrastructure in air quality management: "Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement." *However, it doesn't go on to state how green infrastructure will incorporated into this application.*
Construction impacts such as dust and odours	A	The AQA summarises the types of activities that have the potential to generate dust during construction phase, including movement of vehicles, earthworks, demolition, excavation, surfacing works and installation of furniture/vegetation, among others. The AQA also states that any effects on human health would be temporary (during construction) and can be minimised by the application of industry standard mitigation measures as part of the Construction Environmental Management Plan

		(CEMP). We would expect a dust management plan to be included here.
Opportunities to increase active travel		The AQA refers to SODC's long term strategy which includes air quality objectives which encourage active travel, further details as to how the scheme will promote active travel are provided in the chapter on population health.
Conclusion	A	The AQA identifies sensitive receptors and states that these were chosen based on the areas where pollutant concentrations were likely to be highest. As no receptors are predicted to experience an exceedance of the objective for annual mean NO2, a conclusion of no likely significant air quality effects is recorded for the construction traffic impacts. However, due to the scale of the Scheme and the presence of public exposure receptors close to the Site boundary, e.g. residential properties and education facilities, there is potential for adverse air quality effects during the construction of the Scheme in relation to construction dust and plant equipment. Proposed mitigation measures must be implemented in full – see below.

Appendix AM2.7 Email dated 20 January 2023 from Healthy Place Shaping team for SODC and VoWHDC

A consultation email from the Healthy Place Shaping team for SODC and VoWHDC which sets out their assessment of how health has been accounted for in the Environmental Statement.

District: South and Vale
Planning Ref: R3.0138/21
Team: Healthy Place Shaping
Officer's Name: Rosie Rowe and John Lee
Officer's Title: Head of Healthy Place Shaping and Health Improvement Practitioner
Date: 20/01/2023

Once completed please email your comments to emily.catcheside@oxfordshire.gov.uk

Comments

Didcot Garden Town HIF 1 Scheme
Environmental Statement – Volume I

The public health team have reviewed the following chapters in the environmental statement in order to assess the impact of the scheme on human health and wellbeing:

- Chapter 13: Population and Human Health
- Chapter 6 Air Quality
- Chapter 10: Noise and vibration

It is noted that at the time of the scoping review for the environmental impact assessment in 2020, there was no requirement for a separate Health Impact Assessment to be undertaken of major infrastructure schemes. However, the relevant chapters in the environmental statement provide sufficient information for an assessment of the impacts of the scheme, positive, negative and neutral, on health and wellbeing. Our comments address the impact of the scheme on the following:

- Air Quality
- Noise and Vibration
- Physical Activity
- Access to nature, green and blue spaces
- Connectivity and climate impact

Air Quality
The applicant confirms that there are no AQMAs within the study area, although there are potentially some concerns about neighbouring areas such as the Abingdon AQMA (3 km away). The AQA identifies sensitive receptors and states that these were chosen based on the areas where pollutant concentrations were likely to be highest. As no receptors are predicted to experience an exceedance of the objective for annual mean NO2, a conclusion of no likely significant air quality effects is recorded for the construction traffic impacts. However, due to the scale of the Scheme and the presence of public exposure receptors close to the Site boundary, e.g., residential properties and education facilities, there is potential for adverse air quality effects during the construction of the Scheme in relation to construction dust and plant equipment.

Proposed mitigation measures must be implemented in full – see below.

Noise and Vibration
The Scheme will result in changes to the levels of traffic congestion on the road network through the redistribution of traffic. The assessment provides detailed information on how the redistribution of traffic will change the air quality and ambient noise environments at different receptors across the study areas resulting in a positive, negative or neutral outcome on the health of local communities. The assessment concludes that in total, 187 residential buildings in the study area are anticipated to experience a minor, moderate or major increase in traffic noise levels in the opening year, and 1,862 a decrease, based on the façade with the greatest magnitude of change. There will remain a number of properties which will experience a significant adverse impact from this scheme but will not benefit from the Noise Insulation Regulations 1975.

Given that one of the receptors is negatively affected both during the construction and operational phases is a nursery, ***additional information*** *is requested to identify any additional mitigations that are possible to reduce adverse impacts on air quality and noise in the short and long term on Culham Science Centre Nursery and Preschool.*

Mitigations
During the construction phase, a number of properties have been identified that will suffer Significant Observable Adverse Effect and vibration annoyance. A Construction Environmental Management Plan (CEMP) is mentioned as a way of minimising any air quality related effects of the dust and to reduce noise and vibration impact generated during construction. Given that the population health assessment has identified that a number of sensitive receptors will be adversely impacted during the construction phase, it is essential that effective monitoring is undertaken to ensure that the Noise and Vibration Management Plan (NVMP) and the Dust Management Plan are being fully implemented and adhered to in order to mitigate potential noise and vibration impacts.

It is recommended that the results of surveys including physical measurements and observational checks and audits to ensure that BPM should be publicly accessible.

Physical Activity
The Scheme will provide new footpaths/ cycleways and aims to improve safety along the road. In order to maximise use of this cycling and walking infrastructure, trees, shrubs and hedges should visually separate the road from the cycle and pedestrian paths alongside the road.

It is recommended that current levels of planting need to be enhanced to make this cycling and walking environment more attractive and to ensure that the local population increase active travel and participation in recreational activities.

It is noted that temporary closure of multiple sections of PRoW will reduce the amount of opportunities to undertake physical exercise.

In order to minimise the negative outcomes on health during the construction phase, clear signage of rerouting of PRoWs and advance publicity regarding these changes is essential.

Access to natural green and blue spaces
Access to green and public space is important for both physical health and mental wellbeing. Construction of this scheme will result in the loss of over 50,000m2 tree cover and no detail is provided relating to the impact on hedgerows and other planting. In addition, although green infrastructure is mentioned as a way of mitigating air pollution, the applicant does not provide any detail as to how any proposed green infrastructure will affect air quality.

It is recommended that the level of planting is enhanced in order to minimise adverse impacts on biodiversity, improve air quality and encourage use of new active travel infrastructure.

Connectivity and climate change mitigation
This proposal will deliver key transport infrastructure, relieve congestion and improve connectivity and will support new housing and employment growth. As such it has the potential to improve human health. It is noted that where temporary or permanent access to private property or housing, community land and assets including open space and nature; community recreational and healthcare infrastructure as well as development land, and businesses, is severed as a result of the Scheme, appropriate alternative temporary or permanent access will be provided.

In order to ensure that the scheme positively mitigates against climate change it is important that the scope and biodiversity of planting is maximised.

Appendix AM2.8 Extract from the HUDU Planning for Health Rapid Health Impact Assessment Tool (2019)

An extract of the Rapid Health Impact Assessment Matrix.

Section 1 – HUDU Rapid Health Impact Assessment Matrix

The assessment matrix is designed to rapidly assess the likely health impacts of development plans and proposals, including planning frameworks and masterplans for large areas, regeneration and estate renewal programmes and outline and detailed planning applications. It should be used prospectively at the earliest possible stage during plan preparation, or prior to the submission of a planning application to inform the design, layout and composition of a development proposal.

The matrix does not identify all issues related to health and wellbeing, but focuses on the built environment and issues directly or indirectly influenced by planning decisions. It is generic and should be localised for specific use. Not all the issues or assessment criteria may be relevant and the user is encouraged to prioritise specific actions which focus on key impacts.

The assessment matrix identifies eleven topics or broad determinants. Under each topic, Section 2 of the tool identifies examples of planning issues which are likely to influence health and wellbeing and the section also provides supporting information and references.

Health impacts may be short-term or temporary, related to construction or longer-term, related to the operation and maintenance of a development and may particularly affect vulnerable or priority groups of the population. This should be indicated in the details / evidence section. Where an impact is identified, actions should be recommended to mitigate a negative impact or enhance or secure a positive impact.

Name of assessor / organisation: .....

Name of project (plan or proposal): .....

Planning reference (if applicable): .....

Location of project: .....

Date of assessment: .....

1 Housing design and affordability

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal seek to meet all 16 design criteria of the Lifetime Homes Standard or meet Building Regulation requirement M4 (2)?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal address the housing needs of older people, ie extra care housing, sheltered housing, lifetime homes and wheelchair accessible homes?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include homes that can be adapted to support independent living for older and disabled people?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal promote good design through layout and orientation, meeting internal space standards?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include a range of housing types and sizes, including affordable housing responding to local housing needs?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal contain homes that are highly energy efficient (eg a high SAP rating)?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

2 Access to health and social care services and other social infrastructure

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal retain or re-provide existing social infrastructure?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal assess the impact on health and social care services and has local NHS organisations been contacted regarding existing and planned healthcare capacity?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include the provision, or replacement of a healthcare facility and does the facility meet NHS requirements?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal assess the capacity, location and accessibility of other social infrastructure, eg primary, secondary and post 19 education needs and community facilities?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal explore opportunities for shared community use and co-location of services?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

3 Access to open space and nature

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal retain and enhance existing open and natural spaces?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
In areas of deficiency, does the proposal provide new open or natural space, or improve access to existing spaces?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal provide a range of play spaces for children and young people?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal provide links between open and natural spaces and the public realm?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Are the open and natural spaces welcoming and safe and accessible for all?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal set out how new open space will be managed and maintained?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

4 Air quality, noise and neighbourhood amenity

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal minimise construction impacts such as dust, noise, vibration and odours?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal minimise air pollution caused by traffic and energy facilities?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal minimise noise pollution caused by traffic and commercial uses?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

5 Accessibility and active travel

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal address the ten Healthy Streets indicators?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal prioritise and encourage walking, for example through the use of shared spaces?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal prioritise and encourage cycling, for example by providing secure cycle parking, showers and cycle lanes?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal connect public realm and internal routes to local and strategic cycle and walking networks?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include traffic management and calming measures to help reduce and minimise road injuries?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Is the proposal well connected to public transport, local services and facilities?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal seek to reduce car use by reducing car parking provision, supported by the controlled parking zones, car clubs and travel plans measures?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal allow people with mobility problems or a disability to access buildings and places?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

6 Crime reduction and community safety

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal incorporate elements to help design out crime?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal incorporate design techniques to help people feel secure and avoid creating 'gated communities'?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include attractive, multi-use public spaces and buildings?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Has engagement and consultation been carried out with the local community and voluntary sector?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

7 Access to healthy food

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal facilitate the supply of local food, for example allotments, community farms and farmers' markets?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Is there a range of retail uses, including food stores and smaller affordable shops for social enterprises?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal avoid contributing towards an over-concentration of hot food takeaways in the local area?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

8 Access to work and training

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal provide access to local employment and training opportunities, including temporary construction and permanent 'end-use' jobs?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal provide childcare facilities?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include managed and affordable workspace for local businesses?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include opportunities for work for local people via local procurement arrangements?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

9 Social cohesion and inclusive design

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal consider health inequalities by addressing local needs through community engagement?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal connect with existing communities, ie layout and movement which avoids physical barriers and severance and land uses and spaces which encourage social interaction?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal include a mix of uses and a range of community facilities?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal provide opportunities for the voluntary and community sectors?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal take into account issues and principles of inclusive and age-friendly design?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

10 Minimising the use of resources

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal make best use of existing land?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal encourage recycling, including building materials?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal incorporate sustainable design and construction techniques?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

11 Climate change

Assessment criteria	Relevant?	Details/evidence	Potential health impact?	Recommended mitigation or enhancement actions
Does the proposal incorporate renewable energy?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal ensure that buildings and public spaces are designed to respond to winter and summer temperatures, for example ventilation, shading and landscaping?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal maintain or enhance biodiversity?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	
Does the proposal incorporate sustainable urban drainage techniques?	☐ Yes ☐ No ☐ N/A		☐ Positive ☐ Negative ☐ Neutral ☐ Uncertain	

Appendix AM2.9 Appendix 3 of the Oxfordshire Health Impact Assessment Toolkit

A checklist to be used by local authorities to assess submitted Health Impact Assessments for completeness and quality, according to the Oxfordshire Health Impact Assessment Toolkit

Appendix 3: Rapid HIA Review Checklist

	CRITERIA	GRADING ADEQUATE (A) FURTHER INFORMATION NEEDED (F) INADEQUATE (I)	COMMENTS • WHAT'S MISSING? • ARE THERE ANY WEAKNESSES/WHAT NEEDS STRENGTHENING? • WHAT'S HELPFUL OR COMPLETED WELL?
	Section 1: Description of the proposed development		
1.1	There is a clear description of the project being assessed including: • Aims and objectives of the proposed development; • Physical characteristics of the site of the proposed development and surrounds; • Characteristics of the proposed development once operational; and • Timescales and durations of the construction and operational phases of the proposed development.		
1.2	Policy context for the project has been set out, noting any relevant health and wellbeing policies.		
	Section 2: Identification of population groups affected by the development		
2.1	A process to identify groups of the population likely to be affected by the proposed development has been undertaken.		
2.2	Evidence to support the inclusion of identified groups has been provided, this might be presented as a Population Profile and could include quantitative and qualitative information.		
	Section 3: Identification of geographical area and associated health priorities		
3.1	A process to identify the geographical scope of the assessment has been undertaken.		
3.2	Health priorities for the affected geographic scope are identified for inclusion in the assessment. Any additional priority themes are also identified for inclusion should they be considered relevant.		
	Section 4: Assessment of health		
4.1	**Baseline**		
4.1.1	There should be a narrative which interprets the data collected in the context of the HIA.		
4.1.2	The HIA uses robust data sources which could include other key environmental or technical specialists involved in the proposed development		
4.2	**Evidence**		

	CRITERIA	GRADING ADEQUATE (A) FURTHER INFORMATION NEEDED (F) INADEQUATE (I)	COMMENTS • WHAT'S MISSING? • ARE THERE ANY WEAKNESSES/WHAT NEEDS STRENGTHENING? • WHAT'S HELPFUL OR COMPLETED WELL?
4.2.1	The sources of evidence used are relevant to the project and scale of the HIA.		
4.2.2	Evidence and data sources used are clearly referenced.		
4.2.3	The quality and depth of evidence is sufficient to inform the assessment of likely impacts.		
4.2.4	There is some critical assessment of the literature used.		
4.2.5	Any limitations of the evidence collected are highlighted and a rationale provided.		
4.3	**Stakeholder Engagement**		
4.3.1	Evidence of discussion with the appropriate Local Authority Officer to agree a proportionate approach to stakeholder engagement is provided, and this approach has been followed.		
4.3.2	The report identifies all stakeholder groups relevant to the health assessment for the proposed development.		
4.3.3	The range of stakeholders and the variety of groups that were engaged has been recorded.		
4.3.4	The methods of engagement were appropriate, and their effectiveness evaluated.		
4.3.5	There is evidence that information gathered from stakeholders has been used to inform and influence the assessment.		
4.4	**Health effects**		
4.4.1	Any positive impacts, or opportunities to maximise health and wellbeing outcomes, are identified and how they were identified is presented clearly.		
4.4.2	Any negative impacts, gaps or unintended consequences are identified and how they were identified is presented clearly.		
4.4.3	It is made clear how each impact identified is supported by the evidence gathered. The strength and sources of evidence for each impact is clearly communicated.		
4.4.4	It is clear who will be impacted, with affected populations explicitly identified, and any potential inequalities in the distribution of impacts are identified.		

	CRITERIA	GRADING ADEQUATE (A) FURTHER INFORMATION NEEDED (F) INADEQUATE (I)	COMMENTS • WHAT'S MISSING? • ARE THERE ANY WEAKNESSES/WHAT NEEDS STRENGTHENING? • WHAT'S HELPFUL OR COMPLETED WELL?
4.5	**Summary**		
4.5.1	A conclusion is provided summarising the key outcomes and messages from the assessment, any recommendations to manage health effects, and supporting evidence.		
4.5.2	Any recommendations for further action identify who is responsible for taking forward the action.		
	Conclusions of the reviewer: *(Commentary on the overall quality of the HIA identifying key strengths and weaknesses)*		