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Our ref: SV/2021/111053/01-L01
Your ref: TR010063-000006

Date: 13 August 2021

Dear Madam/Sir

SCOPING CONSULTATION AND NOTIFICATION OF THE APPLICANT'S CONTACT DETAILS AND DUTY TO MAKE AVAILABLE INFORMATION TO THE APPLICANT IF REQUESTED - M5 J10 CHELTENHAM GLOUCESTERHSIRE

Thank you for consulting the Environment Agency (EA) on the above Environmental Impact Assessment (EIA) Scoping Consultation. We have reviewed the EIA Scoping Report dated 05 July 2021 undertaken by Atkins on behalf of Gloucestershire County Council (GCC). We have the following comments on matters within our remit:

FLOOD RISK

With regards the requirements set out in Chapter 8 Road Drainage and the Water Environment, that includes flood risk, we have the following comments to make.

All the relevant sources of flooding and potential impacts have been identified in the Scoping Report that will need to be included within the final Flood Risk Assessment (FRA).

We have already had extensive pre-application discussions with GCC (via their consultants Atkins) regards the hydraulic modelling report which we are awaiting to be submitted to us for its final review.

Initial discussions have also been undertaken with regards the principles of appropriate mitigation. However, these issues can only be progressed once the hydraulic modelling has been signed off and detailed designs submitted.

We are satisfied with the content of the Scoping Report with regards to flood risk, and have no further comments to make.

Our focus, role and remit in this regard relates to fluvial flooding from main river sources. The Lead Local Flood Authority (LLFA) leads on other sources of flooding and surface water drainage matters, including Sustainable Drainage Systems (SuDS).

BIODIVERSITY

The general approach of the Scoping Report aligns with standard practice. The key reports and surveys we would expect to be undertaken have been identified in the Scoping Report, including the requirement for a Water Framework Directive (WFD) Compliance Assessment. We have the following comments on some of the detail of the scoping report. Our focus, role and remit in this regard relates primarily to water based

ecology. For wider biodiversity advice the comments of Natural England, Gloucestershire Wildlife Trust and GCC's biodiversity Officer may all be sought.

We welcome the intention in 4.3.27. to report embedded mitigation in the project description but have requested that assessment of impacts without embedded mitigation is also clarified.

Whilst we welcome Objective 5 for the scheme to deliver a package of measures which is in keeping with the local environment and minimises any adverse environmental impacts there should be a clear commitment to include enhancement which could, at least in part, be characterised as Net Environmental Gain.

We consider it premature, as described in 4.3.48 and elsewhere, to conclude it not likely that the Scheme could give rise to impacts on any European Sites, either for the Scheme alone, or in combination with other plans or projects. This is because the watercourses being affected are in hydrological continuity with the Severn Estuary SAC/Ramsar and there are mechanisms to impact on the designated fish assemblage which use the tributaries of the Severn as functionally linked habitat.

We agree with 7.6.18. that although the impacts have not been characterised in detail at this stage, there is potential for significant effects (i.e. moderate significance or above) on ecological features including Bats, Otter; Breeding and wintering birds, Great crested newt and aquatic habitats and species. The latter however is not limited to the River Chelt, although this is the most significant watercourse. The associated species should include specific reference to notable priority Biodiversity Action Plan (BAP) species, for example eel and brown trout, in their own right; the latter species is suffering a dramatic decline.

We cannot support the conclusion in 7.13.4. that with further baseline information to enable refinement of the current 'likely worst case' assumptions, considered option selection and commitment to appropriate mitigation, it is plausible that the majority of the residual effects on biodiversity would be reduced to a Neutral level. The residual operational impacts will adversely affect connectivity for a wide range of biodiversity including aquatic and riparian species, as well as herptiles, birds and bats. In conjunction with landscape, hydrological, noise and air quality impacts the requirement for mitigation and offsetting should not be underestimated.

The mitigation described in section 7.7.14. regarding the design of the culverts with respect to otters would reduce or minimise the obstruction to connectivity for otter rather that prevent obstruction. Mitigation, including offsetting for otters and other wildlife should make reference to the wetland associated with floodplain compensation and SuDS. There should also be specific reference to improving the connectivity of the culvert under the M5 for otters and other wildlife, including fish. It should also be noted that otters move overland between watercourses.

The proposed draft site boundary (identified by a red line) including any associated development and permanent land Figure 2-5 should not be prematurely fixed so as to exclude the possibility of meaningful and comprehensive habitat compensation and enhancement.

The need to ensure that SuDS design is multifunctional should be further expanded and committed to. In Section 9.7.4. it is `anticipated` that design development would include exploring "naturalistic" formations, utilising underground storage features and introducing well-considered landscaping, which would help to integrate the ponds and

mitigate any significant adverse effect on the character of the landscape due to the introduction of incongruent and potentially intrusive features.

We broadly agree with the key considerations in environmentally sensitive culvert design described in section 7.7.31 and elsewhere, where if a clear span structure is not technically feasible or economically viable but the depth of embedded culvert inverts for all box culverts and piped culverts to allow for the formation of a natural watercourse bed are likely to require a culvert invert to a depth of more than 0.15m to 0.3m below design bed level to minimise the formation of a hydraulic jump, and effectively a weir avoid erosion at the upstream or downstream end of a culvert.

Whilst we agree with 7.9.3. that the need for further bird, otter and aquatic species surveys will be reviewed following the completion of surveys and analysis of survey data the development of mitigation needs to take into account the current, past and future population trends and aspirations, particularly given the lifetime of the scheme. Otter populations, for example, are increasing their range. Therefore their requirements should be considered as standard on watercourses.

Conversely, contrary to policy drivers for restoration of biodiversity many species are at a low point or declining. In other words the current baseline, needs to be interpreted in line with the capacity of the environment to support a greater abundance and diversity of species and habitats including the need not to preclude plans and projects to enhance population resilience and habitat quality.

We agree that the Scheme has the potential to significantly impact the water environment, therefore further assessment is warranted. Appropriate mitigation measures that are proportionate to the significance of impacts however needs to take into account the full range of impacts.

We welcome the conclusion that where river realignments are proposed, the designs should replicate the natural character of the watercourse (which may currently be modified) and be considered appropriate improvements to the hydro-morphological and biological quality of the watercourse.

GROUNDWATER AND SURFACE WATER PROTECTION

The Scoping Report (chapter 10 Geology and Soils) has identified the main issues that will need to be considered during the engineering works. The issues being groundwater, surface water and presence of landfills.

The site works overlie Cheltenham sand and gravel and alluvium overlying charmouth mudstone bedrock for the main with part of the site on Rugby/limestone. The superficial deposits are classified as High vulnerability secondary A aquifer. The mudstone bedrock is classified as medium vulnerability undifferentiated aquifer and the limestone as high vulnerability secondary A aquifer.

The proposed works are not in any source protection zones, and there are no licensed groundwater abstractions within the site area. It does not appear that attempts have been made to locate any private water supplies/abstractions. The Local Councils should be contacted with respect to location of private water supplies and this information should be included in the EIA.

There are 2 surface water abstractions and 28 surface water discharges within the site area. The surface water abstractions seem to be mainly downstream on the River Chelt.

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It is likely that the greatest area for risk with the project (in the context of groundwater and surface water protection) will be to surface water. Two main rivers intersect the study area: The River Chelt to the south of the M5 junction 10 and the Leigh Brook to the north. Both rivers flow in westerly direction joining the River Severn approximately 53km west of the study area. It is important that the proposed development and associated mitigation measures protect and enhance these surface water features, as well as ground water. This is a requirement under the WFD.

Even though there are no licensed groundwater abstractions in the area we consider it is necessary to undertake a Water Features Survey (WFS) within the vicinity of the development as it is not only active de-watering that may impact upon any sources, but if the proposed development were to involve changes to ground conditions or surface water flow paths this could have an effect. There is the potential for shallow and perched groundwater given the number of springs on the Ordnance Survey map for this location. In addition a large part of the area is floodplain.

If dewatering is necessary in the superficial deposits during construction the applicant will have to apply for an abstraction licence which will require a full WFS to be undertaken. The application for an abstraction licence will need to be undertaken well ahead of the construction works commencing. At this stage it is not known which consents, permits and licences may be part of the Development Consent Order (DCO), and which may be separate.

In addition, any excavations for borrow pits should also be subject to the need to carry out a WFS. For example it would be appropriate to check for water features within at least a 100m radius of the borrow pit. This would certainly would be the case if the borrow pit excavation involved excavating into the water table (be it perched or the main water table). Furthermore an abstraction licence would also be needed for any dewatering associated with borrow pits.

The EIA should include all the above assessments associated with any borrow pits as well as the road scheme itself.

I trust the above will assist in determining the Scope of the EIA. Please do not hesitate to contact us if you have any queries. We look forward to working further with GCC and their consultants on this scheme through the next stages.

Yours faithfully

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The Planning Inspectorate:
M5Junction10@planninginspectorate.gov.uk.

Our ref: XA/2024/100064/01
Your ref: TR010063

Date: 22 March 2024

Dear Sir/Madam

The M5 Junction 10 Improvements scheme: Development Consent Order: Relevant representation

1.0 The Environment Agency's Role

1.1 The Environment Agency is an executive non-departmental public body, established under the Environment Act 1995.

1.2 We were established to bring together responsibilities for protecting and improving the environment and to contribute to sustainable development. We take an integrated approach in which we consider all elements of the environment when we plan and carry out our work. This allows us to advise on the best environmental options and solutions, taking into account the different impacts on water, land, air, resources and energy.

1.3 We help prevent hundreds of millions of pounds worth of damage from flooding. Our work helps to support a greener economy by protecting and improving the natural environment for beneficial uses, working with businesses to reduce waste and save money, and helping to ensure that the UK economy is ready to cope with climate change. We will facilitate, as appropriate, the development of low carbon sources of energy ensuring people and the environment are properly protected.

1.4 We have three main roles:

- We are an **environmental regulator** – we take a risk-based approach and target our effort to maintain and improve environmental standards and to minimise unnecessary burdens on businesses. We issue a range of permits and consents.

- We are an **environmental operator** – we are a national organisation that operates locally. We work with people and communities across England to protect and improve the environment in an integrated way. We provide a vital incident response capability.

- We are an **environmental adviser** – we compile and assess the best available evidence and use this to report on the state of the environment. We use our own monitoring information and that of others to inform this activity. We provide technical information and advice to national and local governments to support their roles in policy and decision-making.

1.5 The Environment Agency takes action to conserve and secure the proper use of water resources, preserve and improve the quality of rivers, estuaries and coastal waters and groundwaters through pollution control powers and regulating discharge permits.

1.6 We have regulatory powers in respect of waste management and remediation of contaminated land designated as special sites. We also encourage the remediation of land contamination through the planning process.

1.7 The Environment Agency is the principal flood risk management operating authority. It has the power (but not the legal obligation) to manage flood risk from designated main rivers and the sea. The Environment Agency is also responsible for increasing public awareness of flood risk, flood forecasting and warning and has a general supervisory duty for flood risk management. We also have a strategic overview role for all flood and coastal erosion risk management.

2.0 Scope of these Representations

2.1 These Relevant Representations contain an overview of the project issues, which fall within our remit. They are given without prejudice to any future detailed representations that we may make throughout the examination process. We may also have further representations to make if supplementary information becomes available in relation to the project.

2.2 We have reviewed the Development Consent Order (DCO) application, Environmental Impact Assessment (EIA) and supporting documents submitted as part of the above-mentioned application, following notification of its acceptance for Examination on 16 January 2024. Our main key outstanding issues of concern are listed in tables below under each subject with general comments underneath the tables that need to be addressed before the DCO is granted.

3.0 Draft Development Consent Order

3.1 <u>Schedule 2, Part 1, Requirements</u>
Requirement 3: Environmental Management Plan – The Environment Agency requests that it is added as a specific consultee to the discharge of this requirement so that it can advise on matters within its remit.

<u>Schedule 2, Part 8, Requirements</u>
We concur with Land and groundwater contamination section that we should be consulted on any remedial works.

We suggest you add the wording that is in bold - (5) *Remedial measures must be carried out* ***and validated*** *in accordance with the scheme approved under subparagraph (4).*

<u>Schedule 2, Part 11, Requirements</u>
We would like to be consulted on the detailed design due to the environmental impacts.

<u>Schedule 2, Part 13, Requirements</u>
Flood Compensatory Storage – The Environment Agency requests that it is added as a specific consultee to the discharge of this requirement so that it can advise on matters within its remit.

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Schedule 2, Part 18, Requirements

Discharge of water – we would like to be informed of any permits which are addressed under Water Quality and Flood Risk sections "*The undertaker must take such steps as are reasonably practicable to secure that any water discharged into a watercourse or public sewer or drain under this article is as free as may be practicable from gravel, soil or other solid substance, oil or matter in suspension"*.

4.0 Book of Reference

We can concur that the Environment Agency's does not have any land interest that falls within the red boundary provided.

5.0 Key Issues – Biodiversity

5.1 *Bank Erosion and loss of riparian habitat*		
Chapter 7: Biodiversity	Issue	It is assumed that hard engineered bank protection will be required underneath the new bridge structure, due to an increased likelihood of bank erosion (caused in part by shading acting to remove bankside vegetation). At this stage, the details of the bank protection have not been determined but it has been assumed that the length will equal that of the width of the bridge deck and comprise of hard bank protection (e.g. rip-rap or non-biodegradable geotextile) as a worst case scenario.
Section/pages/table reference: 7.8.11 and 7.8.12.	Impact	This may cause permanent modification and potential localised loss of marginal lamprey ammocoete habitat.
	Solution	A bioengineered "green solution" would be used to transition from the grey bank protection to the natural banks up and downstream of the crossing. At the detailed design stage, further assessment and consultation with the Environment Agency is required to minimise and, where possible, exclude hard engineered or inappropriate bank protection and maximise habitat compensation.

5.2 *Channel shading and disturbance*		
Chapter 7: Biodiversity	Issue	The new high clear span crossing over the River Chelt (West Cheltenham Link Road River Chelt Bridge) will result in permanent localised channel shading and loss of riparian habitat associated with earthworks for the construction of the bridge. The placement and use of the temporary haul bridge during construction may also result in temporary disturbance to riparian habitats and temporary in channel shading and as a result localised loss of aquatic plants and riparian vegetation.
Section/pages/table reference:	Impact	Shading caused by the deck will impact in-channel and riparian vegetation structure under the bridge,

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Table 7-15 Table 8-17		as well as potentially having localised adverse impacts on other species such as aquatic macroinvertebrates and fish through habitat quality reduction. The placement and use of the temporary haul bridge during construction may result in temporary disturbance to riparian habitats and temporary in-channel shading and as a result localised loss of aquatic plants and riparian vegetation. Construction activities such as excavation, plant/material movements and piling to accommodate the new watercourse crossing may result in disturbance to aquatic species.
	Solution	We welcome the implementation of mitigation and enhancement measures upstream of the River Chelt M5 culvert and upstream and downstream of the Link Road Bridge crossings. However, we recommend that proposed bank reprofiling, riparian planting and installation of channel feature be further extended. We believe it is proportionate and desirable to extend the reach of the Chelt that will be subject to hydromorphological and ecological enhancements.

5.3 *Hard engineering and bank protection*		
Environmental Master Plan(EMP)	Issue	The indicative cross-sections in drawing number GCCM5J10 ATK EWE ZZ_PO DR LW 000001 of the reaches up and downstream of the Link Road illustrate an asymmetrical channel with significant additional space for river processes, primarily as a result of lowering the inside bends, up stream of the Link Road in particular. The current iteration shows a relatively uniform bank top (bank full) width which has `smoothed out` to some extent the existing meandering form.
Section/pages/ table reference: Indicative River Chelt Link Road River Cross-Sections GCCM5J10 ATK EWE ZZ_PO DR LW 000001	Impact	The Chelt in particular is very geomorphologically active, particularly between the edges of Cheltenham and the M5, where it is naturalising following historic straightening and re-sectioning. It suffers from excessive incision which needs to be redressed and anticipated in any design.
	Solution	The final iteration of the channel cross sections should show more diversity in gradient in all elements of channel geometry to create an attractive naturalistic channel with improved functionality. In the expectation of further dialogue with the Environment Agency e.g. in the context of Flood Risk Activity Permit (FRAP) /statement of common ground etc we can offer more detailed feedback on all the river enhancement commitments to maximise benefits and optimise the designs of the interventions.

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5.4 *Dean brook, River Swilgate and Hatherley brook*		
Chapters: Environmental Statement	Issue	Dean brook, River Swilgate and Hatherley brook aren't labelled, highlighted or included in the assessment screening outcome. All three are within hydrological catchment of the Severn estuary and support qualifying species of the protected site.
Section/pages/ table reference: Land Plans - APP 2.2 /APP/2.2 LAND PLANS REGULATION 5(2)(i) SHEET1, 2 and 10 OF 16 Appendix 7.12 Aquatic ecology survey – APP 6.15 FIGURE7-12A	Impact	The carriageway and potentially some additional land over Dean brook, River Swilgate and Hatherley brook are within the red line boundary and shown as land to be used temporarily. More clarification/confirmation is needed as to what works are taking place (if any) that might affect this watercourse directly or indirectly and the significance of being in land used temporarily? There doesn't appear to be any planned. Additionality of current proposal to significant legacy environmental impacts of M5; loss of habitat, habitat connectivity and increased risk to otters etc. In additions to culverts and training walls under M5 the Swilgate suffered significant unsympathetic realignment at the toe of the M5. The scale of proposed mitigation on the Chelt itself and ditch network at headwaters of Chelt and headwater ditch network not commensurate with impact.
	Solution	If it is not possible to further extend the order/red line boundary limits on the Chelt to accommodate longer lengths for compensation habitat enhancement, we strongly advocate retrofitting otter passes to all relevant watercourses within redline boundary – scheme wide approach. Opportunities to offer mitigation on these watercourses within the estate of Highways and red line boundary mitigation or enhancement.

5.5 *Leigh Brook*		
Chapters: Chapter 7 Biodiversity	Issue	Impacts to Leigh Brook not adequately characterised or mitigated.
Section/pages/ table reference: Table 7-15 7.8.136. Table 7-16	Impact	The extension Leigh Brook Culvert under the M5 0.02 km of open channel and riparian habitat will be permanently lost due to the extension of the Leigh Brook culvert to accommodate the installation of the two northern slip roads. Construction activities such as excavation and plant/material movements to accommodate the culvert extension and channel realignment, may result in temporary disturbance to other aquatic species and riparian species. Although we agree that the section of the Leigh Brook within and immediately adjacent to the Scheme may not support a significant fish population, due to poor

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		habitat quality and intermittent flow. We do not agree that this will act to limit the presence of key sensitive species, such as migratory eel, as much as stated.
	Solution	Reconsider impacts to Leigh Brook, and proposed mitigation.

5.6 *Otters*		
Chapters: Chapter 7 Biodiversity	Issue	Scheme concludes that there will be no impacts to otters. The proposed culverting operations and realignments although unavoidable will affect otter aquatic and terrestrial habitats.
Section/pages/ table reference: 7.8.78. 7.8.171	Impact	The direct loss of watercourses and associated riparian and bankside as a result of new or extended culverts represents a loss to this (and other) species. Injury/mortality to otters as a result of collision with vehicles. Fragmentation of the ditch network in the upper reaches of the Leigh brook and minor tributaries of the Chelt will have a residual impact.
	Solution	Increase extent of riparian mitigation and enhancement states scheme. We urge caution when assessing degradation impacts to these habitats during construction or operation via pollution events or other causes of degradation relying on embedded mitigation to conclude negligible adverse impact.

5.7 *In-combination effects on Severn Estuary SAC/ Ramsar*		
Chapters: Chapter 7 Biodiversity	Issue	The confluence of the Chelt with the Severn has not been considered.
Section/pages/ table reference: 7.8.34 Table 7-15	Impact	Potential adverse impacts to migrating fish species that use the Chelt and Severn confluence. The permanent modifications to the channel during construction and in the operational phase are also relevant as are risks from pollution incidents and ongoing runoff from the road complex. Whilst we agree that the ephemeral nature of some of the channels is likely to limit the presence of fish including key sensitive species, such as migratory eel their presence cannot be excluded in some flow conditions and there is potential to enhance their value to this species.
	Solution	Further consideration on the confluence of the Chelt with the Severn.

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5.8 *Eels*		
Chapters: Appendix 7.14 Habitat Regulations Assessment – Statement	Issue	Value of watercourses other than the Chelt for eel may have been underestimated. The Leigh Brook and some of the other affected watercourses have some potential to support Catadromous fish namely eel. Eel also routinely frequent heavily modified drainage ditches.
Section/pages/ table reference:	Impact	Potential disturbance, injury or mortality to eels during construction.
	Solution	Consider impacts on eels in other watercourses other than the Chelt.

5.9 *Biodiversity Net Gain*		
Chapters: Appendix 7.18 Biodiversity Net Gain (BNG) Environmental Statement Non-technical summary asp 6.1	Issue	Previous version of BNG Metric (Version 3.0) was used. Inappropriate works classed as enhancement when they should be classed as mitigation. All areas within the temporary working area of the scheme noted as being returned after construction to their pre-works baseline habitat type and condition. The river diversity units, in particular the river and ditches appear to significantly overestimate the actual net gain.
Section/pages/ table reference:	Impact	Risk that overrepresented net gain undermines the need for adequate mitigation and enhancement. Missed opportunity to enhance some areas and features within temporary working area.
	Solution	Re-do metric calculations using latest (official) version, unless agreed with Natural England. Re-assess works to determine if some need to be classed as mitigation. Determine if river diversity unit is being overestimated and ensure that measures required by other drivers including WFD are delivered. A combined meeting with Natural England to gain a better understanding of what has been agreed.

5.10 *Great Crested Newts*		
Chapters 7: Biodiversity	Issue	The scheme proposes to create six attenuation basins and the wetland habitat within the flood storage area which `will be designed to benefit biodiversity, including great crested newts`. The current design does not show much biodiversity enhancement, however, optimise the potential of the attenuation ponds.

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Section/pages/ table reference: Table 7-17	Impact	Lack of available habitat specifically for great crested newt. Risk of amphibian mortality (including great crested newts) associated with traditional gullies.
	Solution	We would recommend you Improve the physical design of the basins to make a meaningful contribution to this species and other wildlife.

6.0 Key Issues – Flood Risk

6.1 *Volume 6. (Appendix 8.1 Flood Risk Assessment Part 1 of 2)*		
2.4.4	Issue	Flood plain compensation
	Impact	To mitigate for losses incurred by the construction of the new junction and link road.
	Solution	A full compensation scheme to be delivered prior to commencement of major engineering works to not only offset the final proposed solution but also minimise impacts during the construction period. Clarification is required from applicant.
5.1.8	Issue	Location of Construction Compounds and temporary stockpiling of material.
	Impact	Compounds should avoid being in Flood Zone 3b and 3a. If it is proposed to locate any compound in Flood Zone 3a then appropriate mitigation should be provided. Stockpiling of material should also be avoided in key out of bank flood flow routes.
	Solution	At present no agreement or detail has been provided as to location of compounds or temporary stockpiling and their duration throughout the works. This will need to be agreed in advance of the commencement of works with suitable mitigation, with further plans/information submitted.
5.4.3	Issue	Flood Management Plan.
	Impact	The Flood Management Plan should outline in detail all mitigation measures required during the construction phase.
	Solution	A Flood Management Plan must be submitted prior to the finalisation of designs and commencement of works and include all relevant mitigation measures.
5.4.26 – 5.4.47	Issue	Provision of flood plain compensation scheme.
	Impact	Failure to provide an appropriate scheme will result in impacts to third parties.
	Solution	Whilst a scheme has been agreed in principle no detail designs have been submitted as would be expected to support the application. Whilst this could be conditioned it would have been preferable to have seen detailed designs submitted.
5.4.95 – 5.4.99	Issue	Right to increase flood levels through the DCO.
	Impact	Where full flood plain compensation cannot resolve all flood risk impacts over the lifetime of the development.

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	Solution	A legal agreement with those landowners affected should be submitted as part of this review based on the evidence set out within the Flood Risk Assessment (FRA) in line with common land drainage law or alternative mitigation provided.

We have reviewed the Flood Risk Assessment (FRA) prepared by Atkins dated December 2023 as set out in Appendix 8.1 of the Environment Statement.
We have no objections to the proposals in principle from a flood risk perspective as the evidence presented to support the Development Consent Order (DCO) meet the requirements set out within the National Planning Policy Framework (NPPS) in relation to flood risk.

6.3 *Flood Risk Vulnerability*
We concur that the overall scheme should be designated as 'Essential Infrastructure' as defined in Annex 3 of the National Planning Policy Framework.

6.4 *Flood Zones*
The alterations to the current motorway junction and proposed new link road are in all flood zones as shown on our Flood Map for Planning (including parts of Flood Zone 3b) and defined in Table 1 of the Flood and Coastal Change section of the National Planning Practice Guidance (NPPG).

6.5 *Sequential Test*
Reference to the sequential test is set out in paragraphs 2.2.15 to 2.2.18 of the FRA and the Environment Agency considers that this is a matter solely for the Inspector to determine, we would make no further comment on this matter.

6.6 *Exception Test*
Whilst Essential Infrastructure can be located within all Flood Zones the notes highlighted to table 2 in paragraph 079 of the National Planning Policy Guidance need to be adhered to as highlighted in paragraph 4.3.11 of the FRA.

6.7 *Flood Risk Information*
The applicant has submitted detailed hydraulic modelling to the Environment Agency as part of pre-application discussions with regards the scheme.
This included a 'baseline' model of the existing situation that was reviewed and 'signed off' as acceptable to use by the Environment Agency in April 2022.
A follow on 'preferred options' model was also submitted for review and signed off by us in June 2023.This final model allowed the applicant to assess the potential impacts of the scheme and propose/test appropriate mitigation measures.

6.8 *Climate Change*
The FRA has identified the correct uplifts to fluvial flooding that should be used to assess the potential impacts of climate change over the lifetime of the development as set out in paragraph 4.4.4.
The impacts have formed part of the previously mentioned hydraulic modelling works.

6.9 *Other Forms of Flooding*
We concur with the conclusions set out within paragraph 3.7 and table 3.3 of the FRA in relation to other forms of flooding.

6.10 *Exemption Test Principles*
Following on from the model reviews the applicant has submitted initial details for flood mitigation proposals to meet the requirements of the principles that must be met as listed in paragraph 079 of the NPPG.

6.11 *Remain operational and safe for users in times of flood.*
The Design Flood Level which includes an appropriate 53% uplift for the potential impacts of climate change over the lifetime of the development has been used and additional freeboards applied to ensure that the link road remains operational along with all flood risk infrastructure such as the flood culverts (which are positioned where key out of bank flood flow routes currently exist in Flood Zone 3b) and river bridge meet appropriate design criteria.

6.12 *Result in no net loss of floodplain storage.*
Whilst appropriate level for level, volume for volume flood plain compensation has been difficult to obtain the overall volume of compensation provided and its location shows that no significant impacts will result from the development.

This has been supported by the detailed preferred option hydraulic modelling. However, where some minor impacts do still occur outside of the proposed compensation areas the applicant must obtain the agreement of the effected landowner as part of the DCO process.

It is also key that any proposed compensation works are undertaken prior to construction of the scheme commencing within the flood plain that would also minimise impacts during the construction phase.

However, the level of detail provided on the final compensation designs is deemed limited and several documents referred to within the FRA such as the Baseline and Scheme Hydraulic Modelling Reports have not been included within the submissions, which contain further relevant details to support the application.

6.13 *Not impede water flows and not increase flood risk elsewhere.*
The proposed design includes flood culverts beneath the carriageway embankment within critical areas of out of bank flood flows within the functional flood plain (Flood Zone 3b).

The new bridge across the River Chelt also takes account of the impacts of climate change, though the description within the FRA and the drawings submitted do not align. The hydraulic modelling also confirms that whilst structures would potentially impact on out of bank flow routes, these impacts can be mitigated for.

Hence it is considered that in principle the above key requirements of the exception test can be passed subject to appropriately worded conditions to ensure the works are delivered.

6.14 *Regulatory Easements and need for other permissions.*
Elements of the proposals will also require the prior separate formal permission of the Environment Agency under the Environmental Permitting Regulations (2016) and it is noted that the DCO does not seek to disapply these requirements.

However, this process is seen as secondary to formal planning permission in relation to the final proposed designs and required mitigation in relation to flood risk, which should have been submitted.

7.0 Key Issues – Flood Risk Modelling and Hydrology

7.1

Section 7.4.1 page 68. Recommendations	Issue	The applicant has identified the need to test the detailed design within the hydraulic model to validate the findings of the flood risk assessment. The Environment Agency agree that this is necessary
	Impact	The detailed design should be tested within the hydraulic model to validate the findings of the flood risk assessment
	Solution	As noted in section 7.4.1 page 68 of the flood risk assessment. The Environment Agency agree that the scheme at detailed design is tested within the hydraulic model to ensure that the detailed design remains consistent with the findings of the flood risk assessment
Hydraulic modelling software version	Issue	The baseline and with scheme models were run using TUFLOW version 2018-03-AE-iSPw64 (GPU) according to the reporting and Jacob's 2021/2022 model reviews. More recent versions of TUFLOW are now available
	Impact	The influence of more recent versions of TUFLOW on hydraulic model results is not likely to be significant, however, there could be slight changes in model results.
	Solution	It would be sensible to test the impact on model results following more recent versions of TUFLOW.

7.2 The hydrological assessment and hydraulic modelling for the baseline and with scheme scenario was reviewed on behalf of the Environment Agency by Jacobs in 2021 and 2022. Following these hydrology and model reviews, comments were addressed by Atkins, and no further action was deemed necessary on the hydrological assessment or the hydraulic model. We consider the modelling to be fit for purpose.

7.3 *Section 4.4.4 page 36. Climate Change.*
The peak river flow allowances for climate change used in the hydraulic modelling are correct in respect to the current guidance and no further action is required. A credible maximum scenario has also been tested in line with current guidance. The credible maximum scenario flow uplift of plus 94% is correct. No action is required by the applicant in respect to the climate change allowances used within the hydraulic model.

7.4 *Section 4.5.4 page 38. Hydraulic model input data.*
The list of hydraulic model input data presented in this section of the flood risk assessment reflects the best available datasets except for the Lidar composite

digital terrain model (DTM) data dated 2019. This was current at the time of the Jacobs' 2021/22 reviews of the hydraulic model; however, more recent composite 1 metre resolution Lidar data is now available dated 2022. Comparisons undertaken by the Environment Agency in March 2024 between the 2019 1 metre resolution composite DTM data used in the hydraulic modelling and the latest available 2022 1 metre resolution composite DTM data reveal no differences. No further action is needed by the applicant with respect to the Lidar data used in the hydraulic model.

7.5 *Section 4.5.5 page 38. Hydrological assessment input data and software.*
Atkins hydrological assessment was reviewed by Jacobs on behalf of the Environment Agency in 2021. The hydrological assessment at the time was considered fit for purpose following this review. Hydrological methods and available data have updated slightly since Atkins undertook their hydrological assessment in 2021.

WINFAP version 5 is now available along with HiFlows database version 12.1, an updated version of the ReFH2.3 software, and new design rainfall data (FEH22). Updates to hydrological software and data are not likely to change the design flow estimates used in the hydraulic modelling significantly. To confirm this, checks have been undertaken by the Environment Agency on the 05 March 2024 using ReFH2.3 (version 4.0.8560) and WINFAP5. For the 100-year scenario for the catchment to the M5 crossing these checks confirm very similar peak flows to those documented by Atkins in their 2022 hydrological assessment. No further action is needed by the applicant with respect to the hydrological calculations and input flows used within the hydraulic model. Atkins hydrological assessment remains current and representative.

7.6 *Section 4.5.6 page 39. Calibration.*
The July 2007 event remains the largest event on record for the River Chelt. The Slate Mill gauge closed in 2010 and hence calibration to more recent flood events is not possible within the modelled reach. Inspection of gauge data on the Chelt further upstream (outside of the model domain) at the Arle level gauge confirms that July 2007 was the largest event upstream also. No further action is needed by the applicant with regards to hydraulic model and hydrological calibration

8.0 Key Issues – Water Quality

8.1 *Volume 6. Chapter 8 – Road Drainage and the Water Environment*		
Section 8.7.47	Issue	This section, and section 8.9.13, states that spillage control measures will contain spillages and prevent pollutants from reaching controlled waters if a spill were to occur. Although these measures reduce the risk of spillages reaching the environment, they are unlikely to be able to prevent serious spills (for example a collision involving a HGV tanker carrying polluting material) from entering a watercourse.
	Impact	The Highways England Water Risk Assessment Tool (HEWRAT) spillage assessment quoted considers the risk of pollution from serious spillages. The assumption that the proposed control measures will prevent any contamination from reaching a watercourse is therefore incorrect.

	Solution	Although the Environment Agency agrees that the output of the HEWRAT appears to suggest a low risk of a pollution occurring as the result of a spillage, it should not be assumed that the pollution will be stopped in the event that one does occur. Therefore, a plan should be in place if an event does occur.

8.2 *Register of Environmental Actions and Commitments*		
WE1	Issue	Action WE1 focuses on minimising deterioration in surface water quality resulting from construction activities. A key protection measure for water quality is the requirement to hold and adhere to an environmental permit to discharge any trade or dewatering effluent, as well as surface water runoff from areas of exposed soil. Securing and adhering such a permit is not reflected within this action.
	Impact	If this action to protect water quality is not linked to the need for an environmental permit, then the proposed mitigation measures (for instance the EMP) may not line up with the permit requirements. This could result in pollution events or permit non-compliance.
	Solution	The commitment to obtain and adhere to an environmental permit for any discharges should be included within action WE1. The 2nd iteration of the EMP should reflect how this will be achieved.

9.0 Key Issues – Groundwater and Contaminated Land

9.1 Volume 6. Chapter 10: Geology and Soils		
10.2.15	Issue	There will be a requirement to manage shallow groundwater and/or rainwater ingress were encountered during excavation and earthworks. Whereas any such small-scale dewatering at a rate of <20 m3/d is excluded from permitting, anything more significant will require an abstraction licence if it doesn't meet any of the exemption criteria given in The Water Abstraction and Impounding (Exemptions) Regulations 2017 (legislation.gov.uk) There may also be permit requirements for the subsequent discharge of any waters, unless covered by an exemption too, e.g. Temporary dewatering from excavations to surface water: RPS 261 - GOV.UK (www.gov.uk).
	Impact	Uncontrolled dewatering and/or discharge activities on-site could have an impact upon nearby linked features, such as local wells, watercourses or wetlands.

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	Solution	We advise the Applicant to seek early pre-application advice from the Environment Agency's National Permitting Service to understand and prepare for any requirements. Our standard position is that we recommend that the Applicant twin tracks the DCO and permit applications. At present this has not been undertaken, therefore at this stage we cannot give any assurances that the current proposals will be granted environmental permits where needed.

9.2 Further to our previous response to the Scoping Study ***(ref. SV/2021/111053/01-L01)*** (response attached) we have now also reviewed the Environmental Statement for this M5 Junction 10 Improvements Scheme, Chapter 10: Geology and Soils, Appendix 10.7 Ground Investigation Report and Appendix 8.2B WFD Groundwater Impact Assessment and would like to comment as follows, again from a perspective of the protection of Controlled Waters only.

9.3 We note that superficial deposits of Cheltenham Sand & Gravel and Alluvium are present in the vicinity of the River Chelt and the Leigh Brook, sections of the M5 and also near the A4019 between the M5 Junction 10 and Cheltenham, at depths of 0.2 - 2.7 m below ground level. These are classed as a Secondary A aquifer and are permeable enough to carry substantial groundwater. The Charmouth Mudstone bedrock (a less valuable / unproductive Undifferentiated Aquifer) underlies the Scheme across the majority of the study area, with the Rugby Limestone Member (Secondary A aquifer) present in the south-west of the area only. Made Ground was merely recorded in the vicinity of the existing roads (M5, A4019 and B4634), embankments and structures, with natural topsoil and agricultural activities present in all of the other locations. We understand that no official records of areas of potentially contaminated land or landfills were identified within the study area and no local abstraction licences (public or private) recorded. Also, there are no statutory environmental designations locally.

9.4 An intrusive ground investigation was undertaken and reported in February 2022. We note that a total of 70 samples were recovered from the area, collected from a range of strata and from depths of between ground level to 5.9 m bgl. No visual indications of contamination were recorded in any of the locations progressed during the investigation and only benzo(a)pyrene was identified above the General Assessment Criteria in soil samples collected from five locations within the existing M5 carriageway footprint. Soil leachate samples and groundwater samples were also collected and assessed against Water Quality Standards (WQS), which did show various concentrations of ammoniacal nitrogen, nitrate, chloride, sulphate, metals and organics in exceedances of the Tier 1 standards. However, it was concluded that there was unlikely to be an unacceptable risk to Controlled Waters receptors from these considering that the identified exceedances of metals and inorganics were marginally above the assessment criteria and generally widespread across the Scheme. The concentrations were

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considered likely to be indicative of natural background concentrations associated with farming and naturally high sulphate derived from the underlying Charmouth Mudstone bedrock. In addition, direct comparison of soil leachate results with Tier 1 WQS does not take into account the dilution and attenuation of contaminants that may occur along the pathway between the source and the nearest receptors and no exceedances of the screening criteria were reported in surface water samples.

9.5 It therefore appears that the area in question is ready for redevelopment without the need for further ground investigations, risk assessment or remedial action first. However, we are mindful that the construction activities themselves could potentially introduce new sources of contamination (e.g. from spillages and leaks), expose extracted soils in stockpiles to enhanced leaching and runoff plus create possible new and more direct pollution pathways through piling and/or installation of drainage. The Applicant therefore should aim to undertake –

- Preparation of piling risk assessments as required in accordance with Environment Agency guidance to assess and manage any risks to Controlled Waters.
- Working methods during construction to manage groundwater and surface water appropriately and ensure that there is no run-off from the works, any material / waste stockpiles and/or storage containers into adjacent surface watercourses in accordance with DEFRA and Environment Agency's guidance.
- Stockpile management (such as water spraying and avoiding over stockpiling to reduce compaction of soil and loss of integrity) and timely removal of stockpiled soil to prevent windblown dust and surface water run-off.
- Implementation of an appropriate Materials Management Plan and Site Waste Management Plan to manage all materials during the construction works.

9.6 Finally, also during the actual future operation of the Scheme there will likely be new sources of contamination introduced such as tyre and vehicle debris, spillages and leaks, road de-icing or indeed chemicals from road traffic accidents, with their possible impacts enhanced by newly installed drainage runs. It is therefore essential that the Scheme will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention to mitigate the risk of contamination to Controlled Waters. We understand a drainage strategy has already been developed to allow for management of volumes and quality of any surface runoff from the highway, including the construction of six attenuation basins along the M5, A4019 and the new link road, and we hope these will indeed be able to contain and lock in any gross pollution when needed, as well as filter out any more diffuse inputs. We also trust such features will be lined where needed and subject to ongoing inspection and maintenance during their lifespan. The design of infiltration SuDS schemes and of their treatment stages can be considered but needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment, considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.

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10.0 Environment Management Plan

10.1		
Chapters: Environment Management Plan (EMP) APP 7.3	Issue	The EMP (1st iteration) sets out the framework for future iterations of the EMP. The preferred option doesn't go far enough to ensure all relevant detail for all requisite mitigation and enhancement.
Section/pages/ table reference:	Impact	Risk of unacceptable residual impacts from scheme.
	Solution	Consult the Environment Agency on 2nd iteration of the EMP – known formerly as the construction EMP, in advance of construction starting.

10.2 The EMP lacks details on how the Applicant will maintain oversight of the environmental performance of the principal contractor and subcontractors. Pollution incidents can occur when there is insufficient oversight of contractors and their adherence to environment management procedures. We recommend the 2nd iteration EMP includes details on how oversight will be achieved, including how the project team will be notified of environmental incidents, how often they will monitor and review the performance of the contractors, and how they will manage contracts to ensure that corrective action can be taken in the event of non-compliance with the EMP.

10.3 Annex B of the EMP lists further plans that will be developed along with the 2nd iteration of the EMP. Although monitoring is mentioned elsewhere in the EMP, there is no reference to an environmental monitoring plan within Annex B. Having a dedicated monitoring plan may allow a clearer monitoring strategy, allowing better environmental performance reviews and swifter, more effective, corrective action to be taken if an issue is identified.

10.4 Section D.5.1 states that watercourses will be checked during periods of high rainfall for any potential discharges of sediment-laden run-off. We welcome this proposal, however it may be worth formalising this requirement within the 2nd iteration to make it clear what the trigger level will be for additional checks/monitoring. This will reduce the risk that the checks are not carried out, which in turn reduces the risk that potential pollution events go unobserved.

10.5 A list of current available best practice and guidance which will be followed by contractors during the construction phase should be included.

11.0 River Basin Management Plan

11.1		
Chapters: Environmental Statement Appendix 8.2A WFD Surface Water Impact Assessment - APP 6.15	Issue	Programmes of measures needed to achieve the environmental objectives in the river basin district is not given due consideration.

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Section/pages/ table reference:	Impact	The scheme could restrict the options for future plans and projects to achieve good ecological status in the Severn Estuary. Risk of unacceptable residual impacts from scheme.
	Solution	Consider programmes of measures for Severn Estuary River Bain Management Plan within WFD Assessment.

12.0 Further representations

12.1 In summary, we can confirm that we have no objections to the principle of the proposed development, as submitted. The issues outlined above are all capable of resolution and we look forward to receiving additional information to resolve our outstanding concerns. We will also continue to engage with the Applicant and review the Statement of Common Ground (SoCG).

12.2 We reserve the right to add or amend these representations, including requests for DCO requirements and protective provisions should further information be forthcoming during the examination on issues within our remit.

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

Yours faithfully

Noreen Nargas (MRTPI)
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