

High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 5: Technical appendices

Water Framework Directive compliance assessment (WR-001-000)



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High Speed Two (HS2) Limited, Two Snowhill Snow Hill Queensway Birmingham B4 6GA

Telephone: 08081 434 434

General email enquiries: HS2enquiries@hs2.org.uk

Website: www.hs2.org.uk

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1 Introduction

1.1 Background

- This document is an appendix to the water quality assessment which forms part of Volume 5 of the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES). This report is a route-wide report and covers the following community areas (CA):
 - CA1: Fradley to Colton;
 - CA2: Colwich to Yarlet;
 - CA3: Stone and Swynnerton;
 - CA4: Whitmore Heath to Madeley; and
 - CA5: South Cheshire
- This appendix comprises an addendum to the Water Framework Directive (WFD) compliance assessment presented in the High Speed Two (HS2) Phase 2a (West Midlands Crewe) Environmental Statement (ES)¹ published in July 2017 (the main ES), as well as the Supplementary Environmental Statement (SES1) and Additional Provision Environmental Statement (AP1 ES) published in March 2018².
- 1.1.3 The WFD compliance assessment (referred to hereafter as 'the original WFD assessment') was published in Volume 5, Appendix WR-001-000³ of the main ES. An addendum to the original WFD assessment, which reported the WFD implications of the AP1 revised scheme, was included in the SES1 and AP1 ES Volume 5, Appendix WR-001-000⁴. This document therefore comprises the second addendum to the original WFD assessment.
- 1.1.4 In order to differentiate between the proposals originally described in the main ES and subsequent changes, the following terms are used:
 - 'the original scheme' the Bill scheme submitted to Parliament in July 2017, which was assessed in the main ES;
 - 'the SES1 scheme' the original scheme with the changes described in the SES1 that are within the existing powers of the Bill, submitted to Parliament in March 2018;

¹ HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement

² HS2 Ltd (2018), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary Environmental Statement and Additional Provision Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2a-supplementary-environmental-statement-and-additional-provision-environmental-statement

³ HS₂ Ltd (2017), High Speed Two (HS₂) Phase 2a (West Midlands - Crewe), Environmental Statement, Volume 5, Route-wide Water Framework Directive compliance assessment. Available online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627161/E65A_WR-001-000_Part_1_WEB.pdf and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627163/E65A_WR-001-000_Part_2_WEB.pdf

⁴ HS2 Ltd (2018), High Speed Rail (West Midlands - Crewe), Supplementary Environmental Statement and Additional Provision Environmental Statement, Volume 5: Technical appendices, Water Framework Directive compliance assessment addendum. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692655/G30_WFD_framework_WR-oo1-oo0_WEB.pdf

- 'the AP1 revised scheme' the original scheme as amended by the SES1 changes and AP1 submitted to Parliament in March 2018;
- 'the SES2 scheme' the original scheme with the changes described in the SES2 that are within the existing powers of the Bill; and
- 'the AP2 revised scheme' the original scheme as amended by the SES2 changes and AP2 amendments.

1.2 Purpose of this addendum

1.2.1 The purpose of this addendum is to report on any changes or updates to environmental information and scheme design or assumptions that have occurred since publication of the main ES and SES1 and AP1 ES, which will result in a change in effects and/or the introduction of new effects on WFD status and status objectives.

1.3 Assessment methodology

1.3.1 The assessment method for deriving effects on WFD status and status objectives is outlined in Section 3 and Annex B of the original WFD assessment in the main ES³.

2 Part 1: Supplementary Environmental Statement 2

2.1 New environmental baseline information relevant to WFD

2.1.1 No new environmental baseline data that is relevant to the WFD has been derived that were not reported in the main ES.

2.2 Changes to design or construction assumptions which do not require changes to the Bill

2.2.1 Since submission of the Bill, the need to make changes to the design or construction assumptions has been identified. The changes that do not require a change to the Bill are detailed in SES2. Those relevant to the WFD assessment are summarised in the section below.

Borrow pit hydrogeological modelling (CA1)

- 2.2.2 Since submission of the Bill, additional information relating to the likely ground conditions in the vicinity of all the borrow pits in the Fradley to Colton area has become available. For three of these borrow pits, this indicated that useful aggregates may be present to a maximum depth greater than originally estimated. The new information for the fourth borrow pit (at Blithbury, located to the north of the River Trent viaduct) confirmed that the previous assessment of the maximum depth of aggregates there was as originally estimated.
- 2.2.3 Since submission of the Bill, more detailed hydrogeological models have been developed of the areas around each borrow pit. These models have been used to inform the scope of a ground investigation. They provide an improved, but very precautionary estimate of the areas where groundwater levels could potentially be affected by the AP2 revised scheme. They assume that the borrow pits are excavated, one at a time, to their maximum depth over their full areas and are fully dewatered.
- 2.2.4 For the following borrow pits a maximum depth of 18m has been assumed:
 - Kings Bromley South, located either side of Crawley Lane and to the south of Ashby Sitch, both sides of the route of the Proposed Scheme;
 - Kings Bromley North, located adjacent to the realigned A515 Lichfield Road;
 and
 - Kings Bromley North, located adjacent to the realigned Shaw Lane.
- 2.2.5 For the borrow pit at Blithbury, located to the north of the River Trent viaduct, a maximum depth of 15m is assumed.
- 2.2.6 Initial outputs from a preliminary ground investigation indicates that suitable aggregate may not actually be present to these maximum depths. This further reinforces the conservative and precautionary nature of the assessment of temporary dewatering impacts and effects.

- The general approach to excavation and the restoration proposals are set out in the Borrow pits restoration strategy⁵. Ground permeability in the areas around the borrow pits is based on the British Geological Survey (BGS) mapping data⁶. Conservatively high permeability values have been selected with the aim of ensuring that the maximum potential extent of the impacts is identified.
- This new information has necessitated a review of the potential for adverse effects on local water bodies. Those watercourses that are located within the potential zone of groundwater influence of the borrow pits, for which effects were not reported in the hybrid Bill, are summarised in Table 1. These relate to the three borrow pits at Kings Bromley South and Kings Bromley North, located in the Fradley to Colton area (CA1). The location of these watercourses is shown on map number WR-03-101 in the Volume 5: Water resources and flood risk Map Book in the main ES. Further details of the predicted maximum zone of groundwater influence from these borrow pits are provided in of the SES2 and AP2 ES Appendix Volume 5: Water resources assessment CA1 report (see SES2 and AP2 ES Appendix WR-002-001).

⁵ HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Borrow pits restoration strategy.* Available online at: https://www.gov.uk/government/publications/hs2-phase-2a-environmental-statement-volume-5-borrow-pits-restoration-strategy

⁶ British Geological Survey (2000), The physical properties of minor aquifers in England and Wales: Hydrogeology Group Technical Report WD/00/04, Environment Agency R&D Publication 68

Table 1: WFD surface water bodies / watercourses scoped into the WFD assessment potentially affected by dewatering of the borrow pits (not previous reported at hybrid Bill)

WFD water body (ID)	Watercourse	Borrow pit potentially affecting watercourse not previously reported at hybrid Bill (WFD assessment reference ID)
Pyford Brook Catchment (GB104028047250)	Pyford Brook	Kings Bromley South, located either side of Crawley Lane and to the south of Ashby Sitch, both sides of the route of the AP2 revised scheme (WFD-BPo1)
Bourne-Bilson Brook Catchment	Bourne Brook	Kings Bromley South, located either side of Crawley Lane and to the south of Ashby Sitch, both sides of the route of the AP2 revised scheme (WFD-BPo1)
(GB104028047270)		Kings Bromley North, located adjacent to the realigned Shaw Lane (WFD-BPo ₃)
Trent and Mersey Canal, summit to	Trent and Mersey Canal	Kings Bromley South, located either side of Crawley Lane on the east and to the south of Ashby Sitch, both sides of the route of the AP2 revised scheme (WFD-BPo1)
(GB70410142)		Kings Bromley North, located adjacent to the realigned A515 Lichfield Road (WFD-BP02)
		Kings Bromley North, located adjacent to the realigned Shaw Lane (WFD-BPo ₃)
Trent from Moreton Brook to	Unnamed trib of River Trent	Kings Bromley North, located adjacent to the realigned A515 Lichfield Road (WFD-BP02)
(GB104028047290)	(IVID LOKT) I	Kings Bromley North, located adjacent to the realigned Shaw Lane (WFD-BPo3)
Catchment (GB104028047250) Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) Trent and Mersey Canal, summit to Alrewas (GB70410142) Trent from Moreton Brook to River Tame Bourne Brook Mersey Canal Unnamed trib of River Trent (MB to RT) 1	Kings Bromley North, located adjacent to the realigned A515 Lichfield Road (WFD-BP02)	
	(MD to KT) 2	Kings Bromley North, located adjacent to the realigned Shaw Lane (WFD-BPo ₃)

2.3 Assessment of effects on WFD surface water bodies

Baseline conditions of affected watercourses

The baseline conditions of the watercourses affected by the SES2 scheme are described in the original WFD assessment, Volume 5, Appendix WR-001-000 of the main ES.

Embedded mitigation

- 2.3.2 Mitigation has been embedded within the design, construction methodology and operational phase of the SES2 scheme in order to reduce any adverse impacts on the water environment as far as is reasonably practicable. This mitigation ensures that the scheme is, where possible, inherently compliant with the objectives of the WFD for both surface water and groundwater bodies. This embedded mitigation is described in Section 6.2 of the WFD assessment, Volume 5, Appendix WR-001-000 of the main ES.
- 2.3.3 Following construction, the areas excavated as borrow pit will be restored to the existing levels and land use (as detailed within the Borrow pits restoration strategy, Volume 5: Appendix CT-009-000 of the main ES). Based on the restoration strategy, it is assumed that the material used to backfill the borrow pits will be of lower permeability than the material extracted. Drainage measures will be designed to control groundwater levels and to sustain baseflow to affected watercourses.

Effects on current status

- A detailed impact assessment has been undertaken to identify the magnitude of the effects on the current status of the quality elements of the Pyford Brook Catchment (GB104028047250), Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270), Trent and Mersey Canal, summit to Alrewas (GB70410142), and Trent from Moreton Brook to River Tame (MB to RT) (GB104028047290) surface water bodies. This is in relation to the new SES2 information regarding the potential zone of groundwater influence associated with the dewatering of borrow pits during the construction phase.
- 2.3.5 A revised detailed impact assessment table for each of these water bodies is provided in Annex A of this addendum. These tables note any difference from the original WFD assessment in red. The SES2 information introduces new adverse (amber) effects, with a risk of deterioration of the current status of a number of the quality elements, within each of these water bodies. This is described below.
- The three borrow pits at Kings Bromley South (located either side of Crawley Lane on the east and to the south of Ashby Sitch), Kings Bromley North (located adjacent to the realigned A515 Lichfield Road), and Kings Bromley North (located adjacent to the realigned Shaw Lane) will involve the excavation of floodplain river terrace deposits or glaciofluvial deposits (to a maximum depth of 18mbgl). Depending on the permeability of the underlying strata between the watercourse and the borrow pit, dewatering activities associated with these borrow pit excavations may result in some reductions in the volume of baseflow within Pyford Brook, Bourne Brook, an Unnamed tributary of River Trent (MB to RT) 1 and an Unnamed tributary of River Trent (MB to RT) 2 during the construction phase. This, in turn, may result in associated adverse effects on aquatic biota, physicochemical water quality and hydromorphological regime not previously reported in the original WFD assessment. These effects are considered to have the potential to cause a deterioration in the status of one or more quality elements within these watercourses.
- 2.3.7 Current evidence suggests that the Trent and Mersey Canal has a puddle clay liner⁷. It should in principle therefore be unaffected. The local geology is such that temporary reductions in groundwater level will not cause subsidence and the risk of structural damage occurring to the canal is negligible. If the canal is unlined, local reductions in groundwater level would have potential to induce greater losses of water though its bed and banks. Until this has been confirmed in consultation with the Canal and River Trust (CRT), adverse effects on aquatic biota, physicochemical water quality and the hydromorphological regime of the canal have been identified. These effects are considered to have the potential to cause a deterioration in the status of one or more quality elements of this water body.
- 2.3.8 Consequently, additional mitigation measures (beyond those already embedded in the SES2 scheme) will be required to manage groundwater baseflow to the watercourses, and the Trent and Mersey Canal, during the construction phase. These are described in the section below.

⁷ Institution of Civil Engineers (2018), *Trent and Mersey canal*. Available online at: https://www.ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do/trent-and-mersey-canal

Additional mitigation requirements to reduce the risk of deterioration of current status

The ground investigation now in progress will provide detailed information on the permeability of the ground in the areas adjacent to the borrow pits, which will allow the hydrogeological models to be updated. If these continue to identify potential impacts on surrounding watercourses (including those reported in the WFD assessment in the main ES and those summarised in Table 1 of this report), then additional mitigation measures will be incorporated into the design in order to avoid and/or mitigate the adverse impacts of dewatering of the borrow pits. These mitigation measures will be designed in consultation with the Environment Agency. As well as those measures listed in the original WFD assessment, these measures may include excavating the material from (and backfilling) the borrow pits in phases to reduce the groundwater zone of influence, and/or augmenting flow in the watercourses using water abstracted from the borrow pit excavations.

Residual effects on current status

2.3.10 The implementation of the additional mitigation measures described above will ensure that there are no residual adverse (amber) effects with a potential risk of deterioration in status on the Pyford Brook Catchment (GB104028047250), Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270), Trent and Mersey Canal, summit to Alrewas (GB70410142), and Trent from Moreton Brook to River Tame (GB104028047290) surface water bodies from the borrow pits.

Effects on status objectives

- The Environment Agency's river basin management plan (RBMP) Cycle 2 'reasons for not achieving good status' (RNAG) and 'programme of measures' (PoM) datasets for the relevant surface water bodies affected by the route are provided in Annex F2.1 (Table 43) and F2.2 (Table 45) of the original WFD assessment, respectively.
- The data for the Pyford Brook Catchment (GB104028047250), Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) and Trent from Moreton Brook to River Tame (GB104028047290) surface water bodies have been screened against the new SES2 information regarding the potential zone of groundwater influence associated with dewatering of the borrow pits during the construction phase. No RNAG or PoM data is provided for the Mersey Canal, summit to Alrewas (GB70410142) water body, as this water body has already achieved its Good Overall Status objective under the WFD.
- 2.3.13 The new SES2 information is not expected to result in any risks of the route preventing the future achievement of the status objectives of the relevant water bodies. A summary of this screening assessment is provided below.

Reasons for not achieving good status

2.3.14 The existing RNAG for the Pyford Brook Catchment (GB104028047250) water body relate to: point source and diffuse course pollution from waste water treatment works, agricultural land, and urban areas impacting upon ammonia (phys-chem), phosphate, dissolved oxygen and macrophytes and phytobenthos status.

- 2.3.15 The existing RNAG for the Bourne-Bilson Brook Catchment (trib of Trent)
 (GB104028047270) water body relate to: point source and diffusion course pollution
 from waste water treatment works, agricultural land, and urban areas impacting upon
 phosphate and macrophytes and phytobenthos status.
- 2.3.16 The existing RNAG for Trent from Moreton Brook to River Tame (GB104028047290) water body relate to: point source and diffuse course pollution from waste water treatment works, agricultural land, and urban areas impacting upon phosphate and macrophytes and phytobenthos status; and physical modifications associated with agricultural land and urban/transport development impacting upon fish status.
- 2.3.17 The proposed borrow pits will not affect point or diffuse sources of pollution, or involve any physical modification of watercourses, within these water body catchments.

Programme of measures

- 2.3.18 The PoM for the Pyford Brook Catchment (GB104028047250) water body relate to the control/management of point source inputs from waste water treatment works. This involves a requirement for additional treatment to reduce concentrations of phosphate from the Lichfield sewage treatment works. The proposed borrow pits will not impact upon the implementation of these measures.
- No PoM have been identified by the Environment Agency for the Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) and Trent from Moreton Brook to River Tame (GB104028047290) water bodies as part of the RBMP Cycle 2.

2.4 WFD compliance

No deterioration of current status

- The assessment has identified new adverse (amber) effects on watercourses within the Pyford Brook Catchment (GB104028047250), Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270), Trent and Mersey Canal, summit to Alrewas (GB70410142), and Trent from Moreton Brook to River Tame (GB104028047290) surface water bodies as a result of the new SES2 information (Table 2). These effects are anticipated to cause a potential risk of deterioration in current status of these water bodies, requiring the implementation of additional mitigation measures beyond those embedded within the current design and construction methodology of the SES2 scheme.
- 2.4.2 It is anticipated that these impacts can be mitigated to ensure that there is no residual risk of deterioration of the current status of the relevant water bodies.
 These measures may include, but will not be limited to, one or more of the following:
 - excavating the material from (and backfilling) the borrow pits in phases to reduce the groundwater zone of influence;
 - augmenting flow in the watercourses using water abstracted from the borrow pit excavations;
 - implementing a wider buffer strip, or shallower batter on the excavations;
 - installation of groundwater cut off structures;

- adoption of wet working techniques that avoid the need for dewatering;
 and/or
- creation of a new, temporary lined channel and/or diversion.
- 2.4.3 These measures will be developed in detail with the Environment Agency following completion of ongoing ground investigations and subsequent update of hydrogeological modelling.
- The implementation of these additional mitigation measures will ensure that there are no residual risks of deterioration of the current status of the relevant surface water bodies as a result of the potential adverse effects of dewatering the borrow pits on nearby watercourses.
- 2.4.5 The SES2 scheme is therefore considered to remain compliant with no deterioration of current status objective of the WFD.

Table 2: SES2 changes to the risk of deterioration of overall status of relevant WFD surface water bodies

Water body (ID)	Risk of deterioration	on of overall status of	water body		Compliance
	Original assessment (pre additional mitigation)	Original assessment (post additional mitigation)	SES2 (pre additional mitigation)	SES2 (post additional mitigation)	(original scheme + SES2)
Pyford Brook Catchment (GB104028047250)	Yellow	n/a	Amber	Yellow	Remains compliant
Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270)	Amber	Yellow	Amber	Yellow	Remains compliant
Trent and Mersey Canal, summit to Alrewas (GB70410142)	Green	n/a	Amber	Yellow	Remains compliant
Trent from Moreton Brook to River Tame (GB104028047290)	Amber	Yellow	Amber	Yellow	Remains compliant

No prevention of future status objectives

- 2.4.6 The assessment has screened the new SES2 information against the available RNAG and PoM data for the Pyford Brook Catchment (GB104028047250), Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) and Trent from Moreton Brook to River Tame (GB104028047290) surface water bodies. The new SES2 information does not result in any new risks of the route preventing the future achievement of the status objectives of the relevant water bodies.
- The SES2 scheme is therefore considered to remain compliant with the no prevention of future status objective of the WFD.

3 Part 2: Additional Provision 2 Environmental Statement

3.1 Summary of amendments relevant to WFD

- 3.1.1 The following types of amendments are proposed in the AP2 revised scheme:
 - engineering amendments;
 - · minor utility amendments; and
 - other amendments requiring changes to Bill powers.
- 3.1.2 A summary of these amendments, together with a detailed description of the engineering amendments, is provided in Part 2 (AP2) of the SES2 and AP2 ES Volume 2, Community area reports 1-5. Those relevant to the WFD assessment are described in the sections below.

Additional Provision 2 changes relevant to WFD

3.1.3 Two AP2 amendments have been scoped in as having the potential to have effects on WFD status and status objectives. Table 3 summarises the amendments that have the potential to impact upon the WFD status and status objectives of the relevant WFD water bodies. These amendments are described below.

Amendments affecting Bourne Brook

- 3.1.4 An AP2 amendment is located on Bourne Brook, within the 'Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270)' surface water body.
- 3.1.5 The route within the original scheme intersected Common Lane, with a section of the road to be permanently stopped-up on both sides of the route. Common Lane is an unclassified road that provides access to a number of farm buildings in the vicinity of Bromley Hayes. Accommodation access for farm vehicles will be maintained under the Kings Bromley viaduct reducing the need for farm-related traffic to divert via Crawley Lane and the A515 Lichfield Road. However, the stopping-up will lead to an increase in travel distance of up to 4km for general traffic and result in a minor adverse traffic delay effect, which is significant. The AP2 amendment has therefore been implemented to address the concerns in this area related to vehicle movements in addition to connectivity for non-motorised users (NMUs).
- 3.1.6 The amendment sees an extension of Common Lane to the A515 Lichfield Road realignment, which will require a new set of 13m long culverts to cross the Bourne Brook. This amendment is shown in map CT-06-202 in the SES2 and AP2 ES Volume 2, CA1 Map Book.

Amendments affecting Unnamed tributary of Meece Brook 3

3.1.7 An AP2 amendment is located on a previous unaffected, unnamed tributary of Meece Brook (referred to hereafter as 'Unnamed tributary of Meece Brook 3'), within the Meece Brook from Source to Chatcull Brook (GB104028053080) surface water body. In the absence of field survey data at this stage, this watercourse is considered on a

- precautionary basis to be a moderate value receptor at the location of the access road crossing, and has been scoped into the WFD assessment.
- As part of the amendments, Severn Trent Water Ltd's (STWL) Whitmore borehole will be taken out of their distribution network temporarily due to the potential for contamination during construction activities. Three existing STWL sites have been identified to provide alternative supply to Whitmore borehole and new treatment plants at each site are proposed in the AP2 revised scheme.
- The amendments include a new treatment plant, access road and parking area for operation and maintenance tasks located adjacent and to the rear of the existing Mill Meece treatment plant. Drainage attenuation and mitigation planting has been included as part of the amendment. The access road will cross the Unnamed tributary of Meece Brook 3 with an approximately 21m long culvert. This amendment is shown in map CT-06-225-L3 in the SES2 and AP2 ES Volume 2, CA3 Map Book.

Table 3: Summary of new scheme components proposed under the AP2 revised scheme, with the potential to effect WFD status and status objectives

WFD water body (ID)	Watercourse	Scheme component type	Scheme component name	Design details	Approximate location (NGR)	AP2 WFD assessment addendum ID
Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270)	Bourne Book	Culvert	-	Approx. culvert length: 13m; Approx. culvert diameter: 1.2m	SK 11944 15554	WFD-AP2-01
Meece Brook from Source to Chatcull Brook (GB104028053080)	Unnamed tributary of Meece Brook 3	Culvert	-	Approx. culvert length: 21m; Approx. culvert diameter: 1.2m	SJ 82999 34008	WFD-AP2-02

3.2 Assessment of effects on WFD surface water bodies

Baseline condition of affected watercourses

- The baseline conditions of Bourne Brook is described in the original WFD assessment, Volume 5, Appendix WR-001-000 of the main ES. This includes the area where the new culvert is proposed under the AP2 revised scheme.
- 3.2.2 The Unnamed tributary of Meece Brook 3 was not assessed in the original WFD assessment and the existing condition is currently unknown. The watercourse has therefore been scoped in for detailed impact assessment in this WFD assessment Addendum on a precautionary basis. The watercourse falls within the Meece Brook from Source to Chatcull Brook (GB104028053080) surface water body catchment. The watercourse flows south-westward from the A519 Newcastle Road north of the village Mill Meece (at approximately SJ 83387 34494) to the existing STWL Mill Meece site. The watercourse then enters a culvert under the WCML and is assumed to continue within a culvert to its confluence with Meece Brook.

Embedded mitigation

- 3.2.3 Mitigation has been embedded within the design, construction methodology and operational phase of the AP2 revised scheme in order to minimise any effects on the water environment and to ensure that the scheme is, where possible, inherently compliant with the objectives of the WFD for both surface water and groundwater bodies. This is described in Section 6.2 of the original WFD assessment.
- 3.2.4 Culvert lengths have been reduced as far as reasonably practicable and, where possible, culverts have been designed to be perpendicular to associated track and road crossings to minimise culvert lengths and reduce potential shading effects. The invert level of each culvert is to be buried below the existing bed level of the watercourse. This is to reduce disruption to sediment transfer and to allow build-up of natural substrate, whilst culvert dimensions have been sized to minimise impacts on flow continuity.
- The detailed design of all culverts is to be developed in general accordance with CIRIA7 and Environment Agency guidance and will ensure appropriate low-flow water depths and velocities for fish passage. The detailed design will, where reasonably practicable, aim to incorporate hydromorphological improvements on the river channel, which will be undertaken immediately upstream and downstream of the culvert to compensate for footprint loss.

Effects on current status

- A detailed impact assessment has been undertaken to identify the magnitude of the effects of the AP2 revised scheme on the current status of the quality elements of the Bourne-Bilson Brook Catchment (trib of Trent) (GB GB104028047270) and Meece Brook from Source to Chatcull Brook (GB104028053080) surface water bodies, in relation to the amendments outlined in Table 3.
- 3.2.7 A revised detailed impact assessment table for each of these water bodies is provided in Annex A of this addendum. These tables note in red any difference from the original WFD assessment. The AP2 revised scheme is not expected to introduce any new effects that pose a risk of deterioration of the current status of the quality elements of either water body.
- 3.2.8 The new culvert on Bourne Brook proposed under the AP2 revised scheme will introduce shading and footprint impacts that will cause a new minor, localised adverse (yellow) effect on the biological, physicochemical and hydromorphological quality elements of the watercourse. An overall adverse (amber) effect on a number of the quality elements of the Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) water body, with a risk of status deterioration, was reported in the original WFD assessment and as a result of the SES2 revised scheme (see Table 2). This is due to the potential impacts of dewatering of the borrow pits at Kings Bromley North on the baseflow of Bourne Brook and Crawley Brook during the construction phase. This overall effect at the water body scale is therefore expected to remain the same under the AP2 revised scheme.
- 3.2.9 The new culvert on the Unnamed tributary of Meece Brook 3 proposed under the AP2 revised scheme will introduce shading and footprint impacts that will cause a minor, localised adverse (yellow) effect on the biological, physicochemical and

hydromorphological quality elements of this previously unaffected watercourse. An overall minor, localised adverse (yellow) effect on a number of the quality elements of the Meece Brook from Source to Chatcull Brook (GB104028053080) water body, with no change in status when balanced against the embedded mitigation, was reported in the original WFD assessment. This is driven by the impacts of several small culverts and an underbridge proposed on the Unnamed tributary of Meece Brook 2 watercourse. Whilst the AP2 revised scheme will increase the amount of culverting proposed within the water body by 21m (to a total of 51m), this is not expected to increase the overall effect of the scheme to adverse (amber) with a risk of status deterioration at the water body scale. The overall effect at the water body scale is therefore expected to remain the same under the AP2 revised scheme.

Additional mitigation requirements to reduce the risk of deterioration of current status

3.2.10 No additional mitigation is deemed required to reduce the risk of deterioration of current status of the Bourne-Bilson Brook Catchment (trib of Trent)

(GB104028047270) or Meece Brook from Source to Chatcull Brook (GB104028053080) water bodies as a result of the AP2 revised scheme.

Effects on future achievement of status objectives

- 3.2.11 The Environment Agency's RBMP Cycle 2 RNAG and PoM data for the Bourne-Bilson Brook Catchment (trib of Trent) (GB GB104028047270) and Meece Brook from Source to Chatcull Brook (GB104028053080) surface water bodies have been screened against the new scheme components proposed under the AP2 revised scheme as outlined in Table 3.
- 3.2.12 The AP2 revised scheme is not expected to result in any risks of the route preventing the future achievement of the status objectives of the relevant water bodies. A summary of the assessment findings is provided below.

Reasons for not achieving good status

- 3.2.13 The RNAG for the Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) water body relate to point source and diffuse source pollution from waste water treatment works, agricultural land, and urban areas impacting upon phosphate and macrophytes and phytobenthos status. The new culvert on Bourne Brook proposed under the AP2 revised scheme will not impact upon point and diffuse sources of pollution within the water body.
- The RNAG for the Meece Brook from Source to Chatcull Brook (GB104028053080) water body relate to diffuse source pollution from mixed agricultural land and urban areas impacting upon dissolved oxygen and macrophyte and phytobenthos status. The new culvert on the unnamed tributary of Meece Brook 3 proposed under the AP2 revised scheme will not impact upon point and diffuse sources of pollution within the water body.

Programme of measures

No PoM have been identified by the Environment Agency for the Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) water body as part of the RBMP Cycle 2.

3.2.16 The PoM for the Meece Brook from Source to Chatcull Brook (GB104028053080) water body relate to the control/management of abstractions for water supply and of point source inputs from waste water treatment works. This involves a requirement for modifications to compensation releases (flow augmentation) and for additional treatment to reduce concentrations of phosphate from the Baldwin's Gate sewage treatment works. The new access road culvert on the unnamed tributary of Meece Brook 3 under the AP2 revised scheme will not impact upon the implementation of these measures.

Additional mitigation requirements to reduce the risk of prevention of status objectives

3.2.17 No additional mitigation is deemed required to reduce the risk of prevention of status objectives of the Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) or Meece Brook from Source to Chatcull Brook (GB104028053080) water bodies as a result of the AP2 revised scheme.

3.3 WFD compliance

No deterioration of current status

- 3.3.1 The assessment has identified a new minor, localised adverse (yellow) effect on Bourne Brook and the Unnamed tributary of Meece Brook 3 located within the Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) and Meece Brook from Source to Chatcull Brook (GB104028053080) surface water bodies, respectively, as a result of the AP2 revised scheme. These effects are not anticipated to cause a deterioration in current status of either water body (see Table 4).
- 3.3.2 The AP2 revised scheme is therefore considered to be compliant with the no deterioration of current status objective of the WFD.

Table 4: AP2 changes to the risk of deterioration of overall status of relevant WFD surface water bodies

Water body (ID)	Risk of deterioration	on of overall status of	water body		Compliance
	Original assessment (pre additional mitigation)	Original assessment (post additional mitigation)	AP2 (pre additional mitigation)	AP2 (post additional mitigation)	(original scheme + SES2)
Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270)	Amber	Yellow	Amber	Yellow	Remains compliant
Meece Brook from Source to Chatcull Brook (GB104028053080)	Yellow	n/a	Yellow	n/a	Remains compliant

No prevention of future status objectives

The assessment has screened the AP2 revised scheme against the available RNAG and PoM datasets for the Bourne-Bilson Brook Catchment (trib of Trent)

(GB104028047270) or Meece Brook from Source to Chatcull Brook (GB104028053080) surface water bodies. The AP2 revised scheme is not anticipated to impact on the pressures identified by the Environment Agency that are currently restricting these

- water bodies from achieving their good status objective, or to inhibit the implementation of measures derived to date to address these pressures.
- The AP2 revised scheme is therefore considered to be compliant with the no prevention of future status objective of the WFD.

4 Conclusion

- 4.1.1 This WFD assessment Addendum provides an indication of the likely compliance of the SES2 and AP2 revised scheme at the time the assessment was prepared.
- The assessment has concluded that the new SES2 information, regarding the 4.1.2 potential zone of groundwater influence associated with dewatering of the borrow pits during the construction phase, will cause a new risk of deterioration in the current status of the Pyford Brook Catchment (GB104028047250), Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270), Trent and Mersey Canal, summit to Alrewas (GB70410142), and Trent from Moreton Brook to River Tame (GB104028047290) surface water bodies. It is currently anticipated that it should be possible to develop the means of mitigating these impacts, to ensure that there is no residual risk of deterioration of the current status of the relevant water bodies. These measures may include excavating the material from (and backfilling) the borrow pits in phases to reduce the groundwater zone of influence, and/or augmenting flow in the watercourses using water abstracted from the borrow pit excavations. These measures will be developed in detail with the Environment Agency following completion of ongoing ground investigations and subsequent update of hydrogeological modelling.
- The assessment has concluded that the AP2 revised scheme will not cause a deterioration of the current status of the relevant Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) or Meece Brook from Source to Chatcull Brook (GB104028053080) surface water bodies, or prevent these water bodies from achieving its status objectives.
- 4.1.4 The AP2 revised scheme will therefore remain compliant with the objectives of the WFD.
- 4.1.5 No instances where an Article 4.7 test is required have been identified in this assessment.

5 References

British Geological Survey (2000), The physical properties of minor aquifers in England and Wales: Hydrogeology Group Technical Report WD/00/04, Environment Agency R&D Publication 68

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Institution of Civil Engineers (2018), *Trent and Mersey canal*. Available online at: https://www.ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do/trent-and-mersey-canal

Annex A: Revised detailed impact assessment tables

Table 5: Revised Detailed Impact Assessment - Pyford Brook Catchment (trib of Trent) (GB104028047250)

	ody: Pyford Brook Catchment (trib o		chment (trib of Trent) (GB104028	,047 <u>230</u> j	Detailed Impact Assessm	ent				D	etailed Impact Assessment Results		
Water body ID:	GB104028047250	Watercourse (EIA receptor value):			Pyford Brook (High)								
Hydromorphological designation:	Not A/HMWB	Scheme component:	WFD-PYB-W-01-01 Viaduct	WFD-PYB-W- Access road o		Borrow pit - Kings Bromley South, located eit					Additional mitigation requirements		
Overall Status:	Bad	Description of scheme component:	Pyford Brook Viaduct; Approx. viaduct width: 15m; Approx. viaduct length: 180m; Viaduct height: 10m	Approx. culvert length: 10m; Appro	x. culvert diameter: 0.9m	Approx. total borrow pit surface area: 0.37km ² ; Assumed maxi	mum excavation depth: 18m; Excavation material: sand and gravel; Approx. dis 270m; Approx. total catchment area of watercourse: 28.7km ²	stance from borrow pit to watercourse (at nearest point):	Cumulative effects - effects on				WFD compliance
Status Objective:	Good by 2027	Summary of embedded mitigation:	Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce shading impact.	Culvert length has been reduced as far as reasonably practicable. Invert of culvert to be buried maintain natural substrate. Culvert sized to minimise impact on flow continuity. Detailed do guidance and to ensure appropriate low flow water depths and velocities for fish passage. Hupstream and downstream of the culvert to	esign to be developed in general accordance with CIRIA and Environment Agency ydromorphological improvements to be undertaken to river channel immediately	watercourse and the borrow pit excavation, there is the potential after dewatering and excavation activities will be required to prot land use in accordance with the Phase 2a Borrow Pits Agricult	burses and borrow pits. Excavation will not take place in this zone. Depending of for dewatering and excavation activities to affect watercourse flow regime. The ect the integrity of these watercourses. Following construction, the areas excavarial Restoration Strategy. The materials used to backfill the borrow pit as part of a Drainage measures will be designed to control groundwater levels and to sust	nerefore, site investigation and monitoring before during and vated as borrow pit will be restored to the existing levels and of the restoration plan are assumed to consist of a lower		Overall effect on element	Construction	Residual effect on element	outcome - potential for deterioration of current status
WFD	Classification Elements	2015 Status Status Objective	Shading	Footprint Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint	Changes in flow velocity and volume due to dewatering	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream			Construction Operation		
ıts	Macrophytes and Phytobenthos - combined	Moderate Good by 2027	Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measurable change in quality element	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent shadichannel. Localised adverse effect phytobenthos anticipated (duphotosynthetic activity), but no element when balanced against references.	regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx.1.3% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects anticipated on macrophyte and phytobenthos habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macrophytes and phytobenthos habitat. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel leading to changes in river processes and habitat upstream and downstream. No likely effects anticipated on macrophyte and phytobenthos. No measurable change in quality element.		Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	Additional mitigation measures for the management of groundwater baseflow to the Pyford Brook during the construction phase will be required to ensure that there is no significant impact on the water environment. Mitigation measures will be designed in detail following ground investigation and monitoring of surface	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.	
Biological Quality Elemer	Macroinvertebrates	Bad Good by 2027	Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measurable change in quality element	I anticipated but no change in diality diamont when I and adjustic vegetation) but n	regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quality	within vicinity of watercourse (approx. 1.3% of catchment area of watercourse). No direct physical impact on river channel or		leading to changes in river processes and habitat upstream and downstream. No likely effects anticipated	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body (e.g. restrictive structures significantly affecting biological continuity). Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.	Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	water and groundwater levels and in consultation with the Environment Agency. Mitigation could take the form of: • excavation of material from (and backfilling) the borrow pit in phases to reduce the groundwater zone of influence; • augmentation of flow in the watercourse using water abstracted from the borrow pit excavation; • a wider buffer strip, or shallower batter on the	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.	Compliant - no change in biological status of water body
	Fish	-	Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measurable change in quality element	Localized adverse effects on fish anticipated, but no	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measurable change in quality element.	watercourse) No direct physical impact on river channel or	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fish habitat. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality element		Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	excavations; • installation of a groundwater cut off; • adoption of wet working techniques that avoid the need for dewatering; • creation of a new lined channel and temporary diversion.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.	
	Dissolved oxygen	Bad Good by 2021	Some minor, localised and periodic shading of river channel (with potential associated reduction in photosynthetic activity by aquatic flora). However negligible effect on dissolved oxygen concentrations anticipated. No measurable change in quality element.	range di salah di sa	cr and localised impact tions (due to reduced regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	vicinity of watercourse (approx. 1.3% of catchment area of watercourse). No direct physical impact on river channel or	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on dissolved oxygen, but no change in quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effect anticipated on dissolved oxygen concentrations. No measurable change in quality element		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
	рН	High Good by 2015	Element is insensitive to impact	Element is insensitive to impact Element is insensitive	e to impact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact. No measurable change to quality element		N/A	
cal Quality Elements	Phosphate	Bad Good by 2021	Element is insensitive to impact	Element is insensitive to impact Element is insensitive	e to impact Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 1.3% of catchment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised and temporary adverse effects on phosphate concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required. None required.	N/A	Compliant - no change in physicochemical status of water body
Physicochemi	Ammonia (phys-chem)	Bad Good by 2021	Element is insensitive to impact	Element is insensitive to impact Element is insensitive	e to impact Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx.1.3% of catchment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on ammonia concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	water body all occur upstream of confluence with this water body.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
	Temperature	High Good by 2015	Some minor, localised and periodic shading of river channel. However negligible effect on water temperature anticipated. No measurable change in quality element.	Localised but permanent shading channel. Potential to lead to mine on water temperature. Locali anticipated, but no change in q balanced against mitigation emb	or and localised impact is insensitive to impact Element is insensitive to impact uality element when	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
Specific Pollutants	Ammonia, Copper, Triclosan, Zinc	High by 2015	N/A - Specific pollutants effects screened out for scheme component	N/A - Specific pollutants effects screene	ed out for scheme component	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on specific pollutant concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on specific	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.	Localised and temporary adverse effect anticipated when scheme	y		
	Quantity and dynamics of water flow			Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx.1.3% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on quantity and dynamics of water flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the quantity and dynamics of water flow. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on quantity and dynamics of flow. No measurable change in quality element.		Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.	
nts	Connection to groundwater bodies			Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	e to impact Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in connection to groundwater bodies as a result of dewatering activities. Potential adverse effects on the connection to groundwater bodies. There is a risk that a change in status could occur. Requires additional mitigation.	Element is insensitive to impact		Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	Additional mitigation measures for the management of groundwater baseflow to the Pyford Brook during the construction phase will be required to ensure that there is no significant impact on the water environment. Mitigation	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.	
gical Quality Eleme	River continuity	Supports Good Supports Good by 2015	N/A - Hydromorphology effects screened out for scheme component	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Element is insensitive.	e to impact Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 1.3% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effect anticipated on river continuity. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream	and the second s	take the form of: • excavation of material from (and backfilling) the borrow pit in phases to reduce the	N/A	Compliant - no change in hydromorphological status of water body
Hydromorpholo	River depth and width variation			Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Element is insensitive.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality element	watercourse). No direct physical impact on river channel. No	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the river depth and width variation. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on river depth and variation. No measurable change in quality element	water body all occur upstream of confluence with this water body.	Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	groundwater zone of influence; • augmentation of flow in the watercourse using water abstracted from the borrow pit excavation; • a wider buffer strip, or shallower batter on the excavations; • installation of a groundwater cut off; • adoption of wet working techniques that avoid the need for dewatering;	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.	
	Structure and substrate of the river bed			Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measurable change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx.1.3% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on river substrate (due to a potential increase in siltation), but no change in quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	creation of a new lined channel and temporary diversion.	N/A	
	Structure of the riparian zone			Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Element is insensitive.	e to impact Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 1.3% of catchment area of watercourse). No direct physical impact on riparian zone. No likely effects anticipated on structure of riparian zone. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	

ed Detailed Impact Assessment - Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270)	
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Table 6: Revised Detailed Impact Assessment - Bo Surface water body: Bourne-Bilson Brook Catchment (trib of Tr	Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) f Trent)									Detailed Impact Assessme	nent										Detailed Impact Assessment Results	
Water body ID: GB104028047270					Bourne Bro	ook (High)									Crawley Brook (Moderate)						
Hydromorphological designation: Not A/HMWB	Scheme component: WFD-BRN-W-01-01 Viaduct Borrow pit - Kings Brom		f the Borrow pit - Kings Bromley North, located adjacent to the re	ealigned A515 Lichfield Road Borrow pit -			WFD-BRN-W-01-02 Daylighting (of existing highway culvert)	WFD-BRN-V Highway realign:	V-01-03 nent culvert			WFD-BRN-T-02-01 Highway realignment culvert	WFD-BRN-T-02-02 Viaduct	WFD-BRN-T-02-03 Realignment	Borrow pit - Kings Bromley North, lo	WFD-BP02 ecated adjacent to the realigned A515 Lichfield Road	WFD-BP03 Borrow pit - Kings Bromley North, located adjacent to the	realigned Shaw Lane	WFD-BRN-T-02-04 Highway realignment culvert		Additional mitigation requirem	nents
Overall Status: Moderate	Component: Kings Bromley Viaduct; Approx. viaduct width: 15m; Approx. viaduct length: 980m; Approx viaduct height: 6m Approx. total borrow pit surface of the borrow pit s	rea: 0.37km²; Assumed maximum excavation depth: 18m; Excavation material: sand and gravel; Approx. distance from borrow watercourse (at nearest point): 535m; Approx. total catchment area of watercourse: 37.54km²	w pit to Approx. total borrow pit surface area: 0.16km²; Assumed maximum excavation depth: 18m; Excavation n watercourse (at nearest point): 145m; Total catchment area of w	naterial: sand and gravel; Approx. distance from borrow pit to atercourse: 37.54km ² Approx. total borrow pit surface area: 0.24km ² water	Assumed maximum excavation depth: 18m; Excavation material: sand and gravel; Approx. of ourse (at nearest point): 525m; Total catchment area of watercourse: 37.54km ²	. distance from borrow pit to Approx. existing cu	Ivert length: 9m; Approx. existing culvert dimensions: approximately 3.5m x 2.5m	Approx. culvert length: 10m; App	ox. culvert diameter: 0.9m	Approx. culvert length: 13m; Approx. culvert o	t diameter: 1.2m	Approx. culvert length: 10m; Approx. culvert diameter 0.9m	Kings Bromley Viaduct; Approx. viaduct width: 15m; Approx. viaduct length: 980m; Approx. viaduct height: 6m	Approx. total length of new realigned channel: 60m; Approx. total length of existing channel: 55m; Tota		vation depth: 18m; Excavation material: sand and gravel; Approx. distance from borrow pit to m; Approx. total catchment area of watercourse: 4.97km ²	otal borrow pit surface area: 0.24km²; Assumed maximum excavation depth: 18m; Excavation mate watercourse (at nearest point): 50m; Approx. total catchment area of w	erial: sand and gravel; Approx. distance from borrow pit to watercourse: 4.97km²	Approx. culvert length: 10m; Approx. culvert diameter: 0.9m	Cumulative effects - effects on element	Overall effect on element	WFD compliance Outcome - potentia
Status Objective: Good by 2027	Summary of embedded mitigation: Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce shading impact. A 50m buffer zone is incorporat underlying strata between a waregime. Therefore, site investigation watercourses. Following construction of the current materials.	ed between nearby watercourses and borrow pits. Excavation will not take place in this zone. Depending on the permeability of tercourse and the borrow pit excavation, there is the potential for dewatering and excavation activities to affect watercourse ation and monitoring before during and after dewatering and excavation activities will be required to protect the integrity of to cition, the areas excavated as borrow pit will be restored to the existing levels and land use in accordance with the Phase 2a Eagy. The materials used to backfill the borrow pit as part of the restoration plan are assumed to consist of a lower permeabilities. Drainage measures will be designed to control groundwater levels and to sustain baseflow to the watercourse.	A 50m buffer zone is incorporated between nearby watercourses and borrow pits. Excavation will not to underlying strata between a watercourse and the borrow pit excavation, there is the potential for dewater Therefore, site investigation and monitoring before during and after dewatering and excavation activities Following construction, the areas excavated as borrow pit will be restored to the existing levels and land Restoration Strategy. The materials used to backfill the borrow pit as part of the restoration plan are assur Drainage measures will be designed to control groundwater levels and to sus	A 50m buffer zone is incorporated between nunderlying strata between a watercourse and underlying strata between a watercourse and underlying strata between a watercourse and use in accordance with the Phase 2a Borrow Pits Agricultural need to consist of a lower permeability than the current material. tain baseflow to the watercourse.	the borrow pit excavation, there is the potential for dewatering and excavation activities to itoring before during and after dewatering and excavation activities will be required to prose excavated as borrow pit will be restored to the existing levels and land use in accordance ials used to backfill the borrow pit as part of the restoration plan are assumed to consist of measures will be designed to control groundwater levels and to sustain baseflow to the war	g on the permeability of the to affect watercourse flow otect the integrity of these ce with the Phase 2a Borrow of a lower permeability than patercourse.	within daylighting footprint, equivalent to reaches upstream and downstream of existing culvert	Culvert length has been reduced as far as reasonably practicable. Invert of culvert to transfer and maintain natural substrate. Culvert sized to minimise impact on flow co Environment Agency guidance and to ensure appropriate low flow water depths and versiver channel immediately upstream and downstream	be buried 300mm below the existing bed level to reduce disruption to sediment ntinuity. Detailed design to be developed in general accordance with CIRIA and ocities for fish passage. Hydromorphological improvements to be undertaken to of the culvert to compensate for footprint loss.	lvert length has been reduced as far as reasonably practicable. Invert of culvert to be buried 30 ansfer and maintain natural substrate. Culvert sized to minimise impact on flow continuity. Det ronment Agency guidance and to ensure appropriate low flow water depths and velocities for firiver channel immediately upstream and downstream of the culve	300mm below the existing bed level to reduce disruption to sediment etailed design to be developed in general accordance with CIRIA and fish passage. Hydromorphological improvements to be undertaken to vert to compensate for footprint loss.	educed as far as reasonably practicable. Invert of culvert to be buried 300mm below the existing bed level to reduce d tural substrate. Culvert sized to minimise impact on flow continuity. Detailed design to be developed in general accor ace and to ensure appropriate low flow water depths and velocities for fish passage. Hydromorphological improveme river channel immediately upstream and downstream of the culvert to compensate for footprint loss.	Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce shading impact.	The length of watercourse realignments has been reduced as far as reasonably practicable. Design of the new channel will a capacity and incorporation of appropriate features equivalent to those lost along the existing channel footprint. Where natural enhance hydromorphological condition over the existing condition where reasonably practicable (provided this is compatible and drainage functions). In addition, the design of the new channel will allow for a 10m wide buffer zone for the implementation	A 50m buffer zone is incorporated between nearby watercourses and bunderlying strata between a watercourse and the borrow pit excavation, the attercourses, the design will aim to the watercourses' flood risk and finarginal/riparian improvements. A 50m buffer zone is incorporated between nearby watercourses and bunderlying strata between a watercourse and the borrow pit excavation, the areas excavated as borrow pit will be restored. Restoration Strategy. The materials used to backfill the borrow pit as part of Drainage measures will be designed to control.	torrow pits. Excavation will not take place in this zone. Depending on the permeability of the here is the potential for dewatering and excavation activities to affect watercourse flow regime. A 50m underlying and excavation activities will be required to protect the integrity of these watercourses. Therefore to the existing levels and land use in accordance with the Phase 2a Borrow Pits Agricultural for the restoration plan are assumed to consist of a lower permeability than the current material. Restoration of groundwater levels and to sustain baseflow to the watercourse.	ouffer zone is incorporated between nearby watercourses and borrow pits. Excavation will not take strata between a watercourse and the borrow pit excavation, there is the potential for dewatering site investigation and monitoring before during and after dewatering and excavation activities will construction, the areas excavated as borrow pit will be restored to the existing levels and land use Strategy. The materials used to backfill the borrow pit as part of the restoration plan are assumed Drainage measures will be designed to control groundwater levels and to sustain	place in this zone. Depending on the permeability of the and excavation activities to affect watercourse flow regime. I be required to protect the integrity of these watercourses. En accordance with the Phase 2a Borrow Pits Agricultural to consist of a lower permeability than the current material. In baseflow to the watercourse.	as far as reasonably practicable. Invert of culvert to be buried 300mm below the existing bed level to reduce disruption ubstrate. Culvert sized to minimise impact on flow continuity. Detailed design to be developed in general accordance and to ensure appropriate low flow water depths and velocities for fish passage. Hydromorphological improvements to priver channel immediately upstream and downstream of the culvert to compensate for footprint loss.	other WFD water bodies other WFD water bodies with CIRIA and be undertaken	Construction	Operation Operation
WFD Classification Elements 2015 Status	tus Status Objective Shading Footprint	Changes to water body hydromorphology lead changes in flow velocity and volume due to dewatering changes in river processes and habitats upstre downstream	eam and Footprint Changes in flow velocity and volume due to dewa	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Changes to water body hy Changes in flow velocity and volume due to dewatering changes in river processes down	hydromorphology leading to es and habitats upstream and enstream Footprint / creation of new habitats enstream	Changes to water body hydromorph Shading changes in river processes and habita downstream	ology leading to s upstream and Footprint Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Changes to water body hydron changes in river processes and downstream	orphology leading to bitats upstream and Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	ation of new habitats Footprint Changes in flow v	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint Changes in flow velocity and volume due to dewater	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Changes to water body hydromorpholo Shading changes in river processes and habitats of downstream	ogy leading to upstream and		
Macrophytes and Phytobenthos - combined Moderate	Good by 2027 Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measurable change in quality element. Localised and temporary excar agricultural land within vicinit (approx.1% of catchment area of direct physical impact on river of zone. No likely effects anticipated phytobenthos habitat. No measuratelement.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macrophytes and phytobenthos habitat. There is a risk that a change in status could occur. Requires additional mitigation. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream. No likely effects anticipated macrophytes and phytobenthos. No measurable in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects anticipated on macrophyte and phytobenthos habitat. No measurable change in quality element. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed ma excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed ma excavation in flow regime downstream as a result dewatering activities. Potential adverse effects macrophytes and phytobenthos habitat. There is a a change in status could occur. Requires additionally the status could occur.	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Localised improvement in macrophyte and phytobenthos habit anticipated, but no change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macrophyte and phytobenthos habitat anticipated, but no change in quality element. Localised but permanent improphydromorphology regime. However anticipated on river processes and rephytobenthos habitat upstream and measurable change in quality	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element. Localised but permanent shart channel. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality photosynthetic activity), but element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and hytobenthos anticipated, but no change in quality ment when balanced against mitigation embedded in the scheme. Localised but permanent shading of section channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduptoosynthetic activity), but no change element when balanced against mitigation in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element. 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However negligible effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedded change in quality	to hydromorphology anticipated on river channel. However negligible effect on macrophytes and phytobenthos habitat vert. No measurable ement. Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measurable change in quality element.	Creation of 60m of new realigned channel, with incorporated hydromorphological and parian/marginal habitat improvements (resulting in met gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element. Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream. No measurable change in quality element. Creation of incorporated hydromorphological and hydromorphological regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream. No in macrophytes and phytobenthos habitat upstream and downstream. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects anticipated on macrophyte and phytobenthos habitat, but no ge in quality element. Localised and temporary excavation of area of agricultural land within vicinity of watercourse). No direct physical impact on river channel or riparian zone. No likely effects anticipated on macrophyte and phytobenthos habitat. No measurable change in quality element.	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Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macrophytes and phytobenthos habitat. There is a risk a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel leading to changes in river processes and habitat upstream and downstream. No likely effects anticipated on macrophytes and phytobenthos. No measurable change in quality element. Localised but permanent loss of Localised adverse effects on phytobenthos anticipated, but measurable change element when balanced again the solution.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent changes to hydregime. However negligible effect anticipation embedded change in quality element. Localised but permanent changes to hydregime. However negligible effect anticipation embedded change in quality element.	romorphology pated on river enthos habitat lo measurable .	Adverse effect anticipated when scheme component effects insidered in combination. When balanced against mitigation bedded in the scheme, there remains a risk that there could be ange in the status of the quality element. Requires additional mitigation. Additional mitigation measures for the management of groundwater baseflow to the Bourne Brook and Crawley Brook watercourses during the construction phase will be required to	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Biological Quality Elements Macroinvertebrates High	Good by 2015 Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measurable change in quality element. Localised and temporary exca agricultural land within vicinit (approx. 1% of catchment area of direct physical impact on river of zone. No likely effects and macroinvertebrate habitat. No minor quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macroinvertebrate habitat. There is a risk that a change in status could occur. Requires additional mitigation. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macroinvertebrate habitat. There is a risk that a change in status could occur. Requires additional mitigation.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects anticipated on macroinvertebrate habitat. No measurable change in quality element. Localised and temporary excavation of area of floor (assumed maximum excavation depth: 18mbgl). Potential adverse et macroinvertebrate habitat. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes and habitat upstream and downstream. No likely effects anticipated on macroinvertebrates. 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There is a risk that a change in status could occur. Requires additional mitigation. Change in quantum excavation of area of floodplain (assumed maximum excavation depth: 2 zone leading to changes in upstream and downs: 2 anticipated on macroinvertebrate habitat. 2 Change in quantum excavation depth: 2 zone leading to changes in upstream and downs: 2 anticipated on macroinvertebrate habitat. 2 Change in quantum excavation depth: 2 zone leading to changes in upstream and downs: 2 anticipated on macroinvertebrate habitat. 3 anticipated on macroinvertebra	Removal of existing 10m culvert. Localised but permanent increase in open river habitat. Localised to permanent increase in open river habitat. Localised to permanent increase in open river habitat. Localised but permanent in macroinvertebrate habitat anticipate but no change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macroinvertebrate habitat anticipated (including due to a increase in riparian and aquatic vegetation), but no change in quality element. Localised but permanent improphydromorphology regime. However anticipated on river processes and macroinvertebrate anticipated anticipa	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent sha channel. Localised ad macroinvertebrates anticipated admacroinvertebrates anticipated but no change in quality element when a grant no change in quality element when but no change in quality element when a grant no c	ding of section of river verse effects on ted (including due to a and aquatic vegetation), ment when balanced ded in the scheme. Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. channel. Localised adverse effects on macroinvertebrates ticipated, but no change in quality element when anced against mitigation embedded in the scheme. Localised but permanent shading of section channel. 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However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quality element. Localised but permanent localised but permanent localised adverse effects anticipated, but no change balanced against mitigation of the process of the proces	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrates in quality element when embedded in the scheme. Localised but permanent change regime. However negligible effects on macroinvertebrates anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent change regime. However negligible effects on macroinvertebrates anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	to hydromorphology anticipated on river the habitat upstream neasurable change in int. Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measurable change in quality element.	Creation of 60m of new realigned channel, with incorporated hydromorphological and parian/marginal habitat improvements (resulting in met gain of river channel). Localised improvement is macroinvertebrate habitat, but no change in quality element. Creation of incorporated but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element.	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No likely effects anticipated on macroinvertebrates. No measurable change in quality element Localised but permanent loss of Localised adverse effects on manufacture and downstream and downstream. No likely effects anticipated on macroinvertebrates. No measurable change in quality element scheme.	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrates ality element when mbedded in the mbedded in the Localised but permanent changes to hyd regime. However negligible effect anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body (e.g. restrictive structures significantly affecting biological continuity). Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.	ensure that there is no significant impact on the water environment. Mitigation measures will be designed in detail following ground investigation and monitoring of surface water and groundwater levels and in consultation with the Environment Agency. Mitigation could take the form of: • excavation of material from (and backfilling) the borrow pit in phases to reduce the groundwater zone of influence; • augmentation of flow in the watercourse using water abstracted from the borrow pit excavation; • a wider buffer strip, or shallower batter on the excavations; • installation of a groundwater cut off; • adoption of wet working techniques that avoid	None required. Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures. Compliant - no change in bi status of water body
Fish -	Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measurable change in quality element. Localised and temporary exca agricultural land within vicinit (approx. 1% of catchment area of direct physical impact on river of zone. No likely effects anticipated measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fish habitat. No ity element. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fish habitat. There is a risk that a change in status could occur. Requires additional mitigation.	Localised and temporary excavation of area of floodplain (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects anticipated on fish habitat. No measurable change in quality element. Localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed matercourse). Potential for temporary excavation depth: 18mbgl). 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Potential adverse effects on fish habitat. There is a risk that a change in status could occur. Requires additional mitigation. No direct physical impact ozone leading to changes in upstream and downstanticipated on fish. No meler	Removal of existing 10m culvert. Localised but permanent increase in open river habitat. Localised measurable change in quality ement Removal of existing 10m culvert. Localised but permanent increase in open river habitat. Localised improvement in fish habitat, but no change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in fish habitat anticipated (including due to a increase in riparian and aquatic vegetation), but no change in quality element. Localised but permanent improphydromorphology regime. However in anticipated on river processes and upstream and downstream. No meas quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent shad of channel. Localised adversed adverse effects on fish anticipated, but no change in quality element when balanced against quality element when balanced against embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. calised adverse effects on fish anticipated, but no hange in quality element when balanced against mitigation embedded in the scheme. Localised but permanent shading of culver of channel. Localised adverse effects anticipated (including due to a reduction riparian and aquatic vegetation), but no quality element when balanced against rembedded in the scheme.	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However negligible effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation of culvert. No measurable change in quality element when balanced against mitigation of culvert.	Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measurable change in quality element.	Creation of 60m of new realigned channel, with incorporated hydromorphological and parian/marginal habitat improvements (resulting in met gain of river channel). Localised improvement in fish habitat, but no change in quality element. Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element. Creation of hydromorphological regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in in fish habitat in fish habitat upstream and downstream.	direct physical impact on river channel or riparian	Dorary excavation of area of agricultural ity of watercourse (assumed maximum oth: 18mbgl). Potential for temporary ow regime downstream as a result of vities. Potential adverse effects on fish a risk that a change in status could occur. Universe additional mitigation. No direct physical impact on river channel or riparian agricult (approx. 4 direct physical impact on river processes and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality element measurable change in quality and in the process of the physical impact on river channel or riparian agriculting agriculting agriculting agriculting to changes in river processes and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality zone. No likely effects anticipated on fish. When the process is a specific physical impact on river channel or riparian agriculting agriculting agriculting agriculting to changes in river processes and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality agriculting a	Localised and temporary excavation of area of aural land within vicinity of watercourse 8% of catchment area of watercourse). No sical impact on river channel or riparian kely effects anticipated on fish habitat. No asurable change in quality element. Localised and temporary excavation of area of agricultand within vicinity of watercourse (assumed maxim excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fit habitat. There is a risk that a change in status could on Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality element Localised but permanent loss of Localised adverse effects on fish change in quality mitigation embedded in the cur.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated, but no n balanced against the scheme. Localised but permanent changes to hyd regime. However negligible effect anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent changes to hyd regime. However negligible effect anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation of culvert. No measurable change in quality element when balanced against mitigation of culvert.	romorphology pated on river d downstream ality element.	Adverse effect anticipated when scheme component effects insidered in combination. When balanced against mitigation bedded in the scheme, there remains a risk that there could be ange in the status of the quality element. Requires additional mitigation.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Dissolved oxygen High	Some minor, localised and periodic shading of river channel (with potential associated reduction in photosynthetic activity by aquatic flora). However, negligible effect on dissolved oxygen concentrations anticipated. No measurable change in quality element. Localised and temporary excal agricultural land within vicinit (approx. 1% of catchment area of direct physical impact on river of zone. No likely effects on dissometed in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on dissolved oxygen, but no change in quality element when balanced against mitigation embedded in the scheme. No direct physical impact on river channel or river channel or river processes up and downstream. No likely effect anticipate dissolved oxygen concentrations. No measurement when balanced against mitigation embedded in the scheme.	Localised and temporary loss of area of floodplain (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects on dissolved oxygen. No measurable change in quality element. Localised and temporary excavation of area of floodplain (assumed maximum excavation depth: 18mbgl). Por temporary reduction in flow regime downstreat result of dewatering activities. Potential localised and temporary excavation of area of floodplain (assumed maximum excavation depth: 18mbgl). Por temporary reduction in flow regime downstreat result of dewatering activities. Potential localised and temporary excavation of area of floodplain (assumed maximum excavation depth: 18mbgl). 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Por temporary adverse effects on dissolved oxygen, localised and temporary excavation of area of floodplain (assumed maximum excavation of a section of a s	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effect anticipated on dissolved oxygen concentrations. No measurable change in quality element Localised and temporary loss of area of flood (approx. 0.6% of catchment area of watercours direct physical impact on river channel or riparian zone. No likely effects on dissolved oxygen. The measurable change in quality element.	Localised and temporary excavation of area of floodplain (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on dissolved oxygen, but no change in quality element when balanced against mitigation embedded in the scheme. No direct physical impact zone leading to changes in and downstream. No like dissolved oxygen concerns the change in quality element when balanced against mitigation embedded in the scheme.	t on river channel or riparian in river processes upstream ikely effect anticipated on entrations. No measurable quality element	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in dissolved oxygen concentrations (due to increased photosynthetic activity by aquatic flora), but no change in quality element. Localised but permanent changes to he regime. However negligible effect antiprocesses and dissolved oxygen coupstream and downstream. No meas quality element.	Localised but permanent shad of channel. Potential to lead impact on dissolved oxygen reduced photosynthetic actions arable change in embedded in the change in embedded in the change i	ing of culverted section to minor and localised concentrations (due to vity by aquatic flora). ipated, but no change in ced against mitigation e scheme. Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent shading of culver of channel. Potential to lead to minor and impact on dissolved oxygen concentration reduced photosynthetic activity by aqual Localised adverse effects anticipated, but in quality element when balanced against in embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element. Element is insensed but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised but permanent change regime. However negligible effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Some minor, localised and periodic shading of river channel (with potential associated reduction in photosynthetic activity by aquatic flora). However, negligible effect on dissolved oxygen concentrations anticipated. No measurable change in quality element.	Creation of 60m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measurable change in quality element. Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstream and downstream. No measurable change in quality element. Creation of incorporated hydromorphological regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstream and downstream. No measurable change in quality element.	Localised and temporary loss of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects on dissolved oxygen. No measurable change in quality element. Localised and temporary loss of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects on dissolved oxygen. No measurable change in quality element. Localised and temporary loss of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects on dissolved oxygen. No measurable change in quality element.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effect anticipated on dissolved oxygen, but no change in nt when balanced against mitigation mbedded in the scheme. No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effect anticipated on dissolved oxygen concentrations. No measurable change in quality element	Localised and temporary excavation of area of agricultural and vicinity of watercourse (approx. 4.8% of area of watercourse). No direct physical ariver channel or riparian zone. No likely issolved oxygen. No measurable change in quality element. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maxim excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on dissolved oxygen, but no change quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effect anticipated on dissolved oxygen concentrations. No measurable change in quality element	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised but permanent changes to hyd regime. However negligible effect anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	romorphology pated on river tream and le change in	calised adverse effect anticipated when scheme component ects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	N/a
ements	Good by 2015 Element is insensitive to impact Localised and temporary excar agricultural land within vicinit (approx. 1% of catchment area Localised and temporary reduction activity, with potential associated application of organic and in However negligible effect anticipe concentrations. No measurable element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised and temporary adverse effects on phosphate change in quality Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element. Localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result dewatering activities. Potential localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result dewatering activities. Potential localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result dewatering activities. Potential localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). 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Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element. Localised and temporary excavation of area of agricultural land within vicinity of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Element is insensitive to impact Corary excavation of area of agricultural ity of watercourse (assumed maximum oth: 18mbgl). Potential for temporary ow regime downstream as a result of ties. Potential localised and temporary phosphate concentrations, but no change ent when balanced against mitigation inbedded in the scheme. Element is insensitive to impact activity, application concentrations.	Element is insensitive to impact Elemen	Element is insensitive to impact tural um by for early to be an e	to impact Element is insensitive to impact Element is insensitive to impact to impact Element is insensitive to impact Element is insensitive to impact	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.	calised adverse effect anticipated when scheme component exts considered in combination. No change in quality element when balanced against mitigation embedded in the scheme. None required.	N/a None required. Compliant - no change physicochemical status of body
Ammonia High	Good by 2015 Element is insensitive to impact activity, with potential associa application of organic and incention to the impact application of organic and incention to the impact application of organic and incention to the impact activity, with potential associa application of organic and incention to the impact activity, with potential associated application of organic and incention to the impact activity, with potential associated application of organic and incention to the impact activity activity activity.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on ammonia concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element. Localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation depth: 18mbgl). Potential for tem	Localised and temporary excavation of area agricultural land within vicinity of watercome (approx. 0.6% of catchment area of watercome (approx. 0.6% of catc	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on ammonia concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	ensitive to impact Element is insensitive to impact	Element is insensitive to impact Element is insensitive to in	npact Element is insensitive to impact Element is insensit	ve to impact Element is insensitive to impact	Element is insensitive to impact Element is insensitive to impac	Element is insensitive to impact Element is insens	nsitive to impact Element is insensitive to impact Element is insensiti	to impact Element is insensitive to impact	Creation of incorporated ri Element is insensitive to impact Element is insensitive to impact Element is insensitive to impact and nutrier anticipate measur	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Localist agricult (approx. Localised but temporary ammonia concentrations, but no change ent when balanced against mitigation mbedded in the scheme. Localist agricult (approx. Localised agricult (approx. Localised activity, application) application concentrations.	Localised and temporary excavation of area of grad land within vicinity of watercourse (4.8% of catchment area of watercourse). and temporary reduction in agricultural with potential associated reductions in tion of organic and inorganic fertilizer. negligible effect anticipated on ammonia ations. No measurable change in quality element. Localised and temporary excavation of area of agricultural within vicinity of watercourse (assumed maxim excavation depth: 18mbgl). 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Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary excavation of area of agricultural excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities.	tural um by f Element is insensitive to impact Element is insensitive ange in	to impact Element is insensitive to impact Element is insensitive to imp	act Loc effect w	calised adverse effect anticipated when scheme component exts considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	N/a
Temperature High	Good by 2015 Some minor, localised and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measurable change in quality element. Element is insensitive to the state of the state	Element is insensitive to impact Element is insensitive to impact	Element is insensitive to impact Element is insensitive to impact	Element is insensitive to impact Element is insensitive to impact	Element is insensitive to impact Element is inse	ensitive to impact Element is insensitive to impact	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in water temperature, but no change in quality element.	Localised but permanent shad of channel. Potential to lead impact on water temperature. I anticipated, but no change in balanced against mitigation en	ing of culverted section to minor and localised cocalised adverse effects quality element when abedded in the scheme.	Localised but permanent shading of culver of channel. Potential to lead to minor and impact on water temperature. Localised ad anticipated, but no change in quality elembalanced against mitigation embedded in the state of the	rerted section and localised adverse effects Element is insensitive to impact Element is insensitiv	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Some minor, localised and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measurable change in quality element.	Element is insensitive to impact Element is insensitive to impact Eler	t is insensitive to impact Element is insensitive to impact Eleme	ent is insensitive to impact Element is insensitive to impact	Element is insensitive to impact Element is insensitive to impact	Element is insensitive to impact Element is insensitive	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	act Eog	calised adverse effect anticipated when scheme component exts considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	N/a
Specific Pollutants Copper, Triclosan, Zinc High	High by 2015 N/A - Specific pollutants effects screened out for scheme design component Element is insensitive to scheme design component	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on specific pollutant concentrations, but no change in quality element when balanced against mitigation embedded in the scheme. No direct physical impact on river channel or in zone leading to changes in river processes up and downstream. No likely effects anticipate specific pollutant concentrations. No measurement.	Localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed man excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result dewatering activities. Potential localised but temporary excavation of area of agrilland within vicinity of watercourse (assumed man excavation depth: 18mbgl). Potential for temporary excavation of area of agrilland within vicinity of watercourse (assumed man excavation depth: 18mbgl). Potential for temporary excavation of area of agrilland within vicinity of watercourse (assumed man excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result dewatering activities. Potential localised but temporary excavation of area of agrilland within vicinity of watercourse (assumed man excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result dewatering activities. Potential localised but temporary excavation of area of agrilland within vicinity of watercourse (assumed man excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result dewatering activities. Potential localised but temporary excavation of area of agrilland within vicinity of watercourse (assumed man excavation depth: 18mbgl). Potential for temporary dewatering activities. Potential localised but temporary excavation depth: 18mbgl) and 18mbgl of a support of a sup	Cultural kimum rary It of porary s, but no itigation The polar of the	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on specific pollutant concentrations, but no change in quality element when balanced against mitigation embedded in the scheme. No direct physical impact of zone leading to changes in and downstream. No like specific pollutant concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	t on river channel or riparian in river processes upstream ikely effects anticipated on centrations. No measurable quality element.	A - Specific pollutants effects screened out for scheme component	N/A - Specific pollutants effects scree	ned out for scheme component	N/A - Specific pollutants effects screened out for s	r scheme component	N/A - Specific pollutants effects screened out for scheme component	N/A - Specific pollutants effects screened out for scheme component	N/A - Specific pollutants effects screened out for scheme component	Element is insensitive to impact Element is insensitive to impact change in quality element	porary excavation of area of agricultural ity of watercourse (assumed maximum oth: 18mbgl). Potential for temporary ow regime downstream as a result of ties. Potential localised but temporary specific pollutant concentrations, but no lement when balanced against mitigation inbedded in the scheme. No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on specific pollutant concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultand within vicinity of watercourse (assumed maxim excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on specific pollutant concentrations, no change in quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on specific pollutant concentrations. No measurable change in quality element.	N/A - Specific pollutants effects screened out for scheme component	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.	alised and temporary adverse effect anticipated when scheme component effects considered in combination. No change in ality element when balanced against mitigation embedded in the scheme. None required.	None required. N/a Compliant - no change pollutant status of w
Quantity and dynamics of water flow	Localised and temporary exca agricultural land within vicinit (approx.1% of catchment area of direct physical impact on river effects anticipated on quantity and flow. No measurable change in	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the quantity and dynamics of water flow. There is a risk that a change in status could occur. Requires additional mitigation. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream. No likely effects anticipate quantity and dynamics of flow. No measurable in quality element.	Localised and temporary excavation of area of floodplain (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on quantity and dynamics of water flow. No measurable change in quality element. Localised and temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agrilland within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation depth:	Cultural ximum rary It of on the k that a tigation. No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on quantity and dynamics of flow. No measurable change in quality element. Localised and temporary excavation of are agricultural land within vicinity of waterco (approx. 0.6% of catchment area of watercoundirect physical impact on river channel. No effects anticipated on quantity and dynamics of flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the quantity and dynamics of water flow. There is a risk that a change in status could occur. Requires additional mitigation. No direct physical impact zone leading to changes in and downstream. No lik quantity and dynamics of in quality	t on river channel or riparian in river processes upstream Removal of existing 10m culvert. Localised improvement in flow dynamics, but no change in qual element. ty element.	Localised but permanent improf hydromorphology regime. However in anticipated on river processes and upstream and downstream. No meas quality element.	Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Element is insensity	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element.	alised but permanent changes to hydromorphology gime. Localised adverse effects on flow dynamics (including potential localised increases in flow points) anticipated, but no change in quality element then balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element. Localised but permanent charge regime. Localised adverse (including potential local velocity) anticipated, but no when balanced against mit schere.	Localised but permanent change regime. However negligible effects on flow dynamics alised increases in flow change in quality element tigation embedded in the time. Element is insensitive to impact processes and quantity and dynamics and downstream. No measurelement tigation embedded in the element element.	to hydromorphology anticipated on river nics of flow upstream le change in quality	Creation of 60m of new realigned channel, with incorporated hydromorphological improvements resulting in 5m net gain of river channel). Localised provement in flow dynamics, but no change in quality element. Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on quantity and dynamics of water flow. No measurable change in quality element. Localised and temporary excavation of area of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on quantity and dynamics of water quantity and dynamics of water flow. No measurable change in quality element.	Dorary excavation of area of agricultural ity of watercourse (assumed maximum oth: 18mbgl). Potential for temporary ow regime downstream as a result of vities. Potential adverse effects on the mics of water flow. There is a risk that a uld occur. Requires additional mitigation. No direct physical impact on river channel or riparian agricultication	Localised and temporary excavation of area of ural land within vicinity of watercourse 8% of catchment area of watercourse). No ysical impact on river channel. No likely cipated on quantity and dynamics of water quantity and dynamics of water to measurable change in quality element. Localised and temporary excavation of area of agricultand within vicinity of watercourse (assumed maxim excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the quantity and dynamics of water flow. There is a risk the change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on quantity and dynamics of flow. No measurable change in quality element. Localised but permanent hydromorphology regime. Localised but permanent hydromorphology r	Element is insensitive to impact balanced against the scheme. Localised but permanent changes to hyd regime. However negligible effect anticip processes and quantity and dynamics of and downstream. No measurable chan element.	romorphology pated on river flow upstream embers cha	Adverse effect anticipated when scheme component effects in sidered in combination. When balanced against mitigation pedded in the scheme, there remains a risk that there could be ange in the status of the quality element. Requires additional mitigation.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Connection to groundwater bodies	Element is insensitive t	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in connection to groundwater bodies as a result of dewatering activities. Potential adverse effects on the connection to groundwater bodies. There is a risk that a change in status could occur. Requires additional mitigation.	Localised and temporary excavation of area of agriculture land within vicinity of watercourse (assumed matercourse (assumed matercourse)). Potential for temporary excavation depth: 18mbgl). Potential for temporary excavation depth: 18mbgl). Potential for temporary excavation depth: 18mbgl). Potential for temporary excavation of area of agriculture and within vicinity of watercourse (assumed matercourse). Potential for temporary excavation of area of agriculture and within vicinity of watercourse (assumed matercourse). Potential for temporary excavation depth: 18mbgl). Potential for temporary excavation depth: 1	cultural ximum rary a result on the that a tigation. Cultural ximum rary Element is insensitive to impact Element Ele	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in connection to groundwater bodies as a result of dewatering activities. Potential adverse effects on the connection to groundwater bodies. There is a risk that a change in status could occur. Requires additional mitigation.	Removal of existing 10m culvert. Localised but permanent re-connection to surrounding shallow groundwater within superficial deposits. However n likely effect anticipated on connection to groundwate bodies. No measurable change in quality element.	Element is insensitive to impact Element is insensitive to in	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	tve to impact Element is insensitive to impact de con	Localised but permanent loss of connection to rounding shallow groundwater within superficial leposits. However no likely effect anticipated on innection to groundwater bodies. No measurable change in quality element.	Localised but permanent surrounding shallow grounded deposits. However no like connection to groundwater change in qual	nt loss of connection to Indwater within superficial Itely effect anticipated on Element is insensitive to impact Element Ele	to impact	Element is insensitive to impact Element is insensitive to impact Eler	Localised and templand within vicin excavation depressitive to impact Element is insensitive to impact of dewatering act connection to grow change in status contains to the	corary excavation of area of agricultural ity of watercourse (assumed maximum oth: 18mbgl). Potential for temporary ection to groundwater bodies as a result tivities. Potential adverse effects on the bundwater bodies. There is a risk that a uld occur. Requires additional mitigation.	Localised and temporary excavation of area of agricultand within vicinity of watercourse (assumed maxim excavation depth: 18mbgl). Potential for temporary reduction in connection to groundwater bodies as a resultant of dewatering activities. Potential adverse effects on connection to groundwater bodies. There is a risk that change in status could occur. Requires additional mitigates.	Localised but permanent loss surrounding shallow groun superficial deposits. Howeve anticipated on connection to gr No measurable change in qu	of connection to indwater within in roo likely effect coundwater bodies. uality element. Element is insensitive to impact Element.	act A con embo	Adverse effect anticipated when scheme component effects insidered in combination. When balanced against mitigation bedded in the scheme, there remains a risk that there could be ange in the status of the quality element. Requires additional mitigation. Additional mitigation measures for the management of groundwater baseflow to the	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Stranger Continuity River continuity	Localised and temporary exca agricultural land within vicinit (approx. 1% of catchment area of direct physical impact on river of zone. No likely effect anticipated No measurable change in qu	ration of area of y of watercourse f watercourse). No nannel or riparian on river continuity. ality element. Element is insensitive to impact Element is insensitive	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effect anticipated on river continuity. No measurable change in quality element.	Localised and temporary excavation of area agricultural land within vicinity of watercours (approx. 0.6% of catchment area of watercours direct physical impact on river channel or rip zone. No likely effect anticipated on river cont No measurable change in quality elements	of se). No Flement is insensitive to impact rian uity.	Removal of existing 10m culvert. Localised improvement in flow continuity, but no change in quality element.	Element is insensitive to impact Element is insensitive to in	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Element is insensit	Local reginanti balan	alised but permanent changes to hydromorphology gime. Localised adverse effects on river continuity ticipated, but no change in quality element when anced against mitigation embedded in the scheme.	Localised but permanent charge regime. Localised adverse of anticipated, but no change balanced against mitigation of	effects on river continuity e in quality element when embedded in the scheme. Element is insensitive to impact Element is insensitive to impact Element is insensitive to impact	to impact	Element is insensitive to impact Element is insensitive to impact Eler	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effect anticipated on river continuity. No measurable change in quality element.	Localis agricult (approx. 4 direct phr zone. No I No n	ed and temporary excavation of area of grail land within vicinity of watercourse 8% of catchment area of watercourse). No sical impact on river channel or riparian kely effect anticipated on river continuity. easurable change in quality element.	Localised but permanent hydromorphology regime. Localised on river continuity anticipated quality element when balanced embedded in the so	changes to sed adverse effects, but no change in against mitigation cheme. Element is insensitive to impact Element E	None - water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no	Bourne Brook and Crawley Brook watercourses during the construction phase will be required to ensure that there is no significant impact on the water environment. Mitigation measures will be designed in detail following ground investigation and monitoring of surface water and groundwater levels and in consultation with the Environment Agency. Mitigation could take the form of:	N/a
Supports Good River depth and width variation	Supports good by 2015 N/A - Hydromorphology effects screened out for scheme design component Localised and temporary excapagricultural land within vicinit (approx. 1% of catchment area of direct physical impact on river deffect on river depth and width measurable change in quality.)	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the river depth and width variation. There is a risk that a change in status could occur. Requires additional mitigation. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream. No likely effects anticipated depth and variation. No measurable change in element	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel. No likely effect on river depth and width variation. No measurable change in quality element. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed material excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse excavation depth: 18mbgl). Potential for temporary excavation depth: 18mbgl). Potential for tempora	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on river depth and variation. No measurable change in quality element Localised and temporary excavation of area agricultural land within vicinity of watercours (approx. 0.6% of catchment area of watercours direct physical impact on river channel. No leffect on river depth and width variation. Impact on river depth and width variation.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the river depth and width variation. There is a risk that a change in status could occur. Requires additional mitigation. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream. No likely depth and variation. No melect physical impact and downstream. No likely depth and variation.	t on river channel or riparian in river processes upstream ly effects anticipated on river measurable change in quality ement Removal of existing 10m culvert. Localised improvement in river width and depth, but no change quality element.	Localised but permanent impro hydromorphology regime. However r anticipated on river processes and depth upstream and downstream. N change in quality eleme	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality element.	alised but permanent changes to hydromorphology gime. Localised adverse effects on river depth and dth anticipated, but no change in quality element hen balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality element. Localised but permanent change regime. Localised adverse width anticipated, but no company when balanced against mit scheme.	Localised but permanent change regime. However negligible effects on river depth and change in quality element tigation embedded in the eme. Element is insensitive to impact processes and river depth and downstream. No measurable change me.	N/A - Hydromorphology effects screened out for scheme component to hydromorphology anticipated on river riation upstream and ge in quality element.	Creation of 60m of new realigned channel, with incorporated hydromorphological improvements (resulting in 5m net gain of river channel). However egligible effect anticipated on river depth and width. No measurable change in quality element. Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel. No likely effect on river depth and width variation. No measurable change in quality element. Localised and temporary excavation of area of watercourse (and within vicinity of watercourse). No measurable reduction in flooding activities on river depth and width variation. No measurable depth and width variation. Status could on the country of the country of the country of the country of watercourse.	corary excavation of area of agricultural ity of watercourse (assumed maximum oth: 18mbgl). Potential for temporary ow regime downstream as a result of es. Potential adverse effects on the river variation. There is a risk that a change in ccur. Requires additional mitigation. Localis agricultural to direct physical impact on river channel or riparian agricultural accurate to changes in river processes upstream and downstream. No likely effects anticipated on river depth and variation. No measurable change in quality on river of the course of	Localised and temporary excavation of area of ural land within vicinity of watercourse 8% of catchment area of watercourse). No cal impact on river channel. No likely effect epth and width variation. No measurable change in quality element. Localised and temporary excavation of area of agricult land within vicinity of watercourse (assumed maxim excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the depth and width variation. There is a risk that a change status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on river depth and variation. No measurable change in quality element embedded in the so	changes to sed adverse effects ated, but no change dagainst mitigation cheme. Element is insensitive to impact processes and river depth and variation downstream. No measurable change in quadrates and contact processes and river depth and variation downstream.	widespread adverse impacts identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body. acon embed uality element.	 Adverse effect anticipated when scheme component effects insidered in combination. When balanced against mitigation bedded in the scheme, there remains a risk that there could be lange in the status of the quality element. Requires additional mitigation. excavation of material from (and backfilling) the borrow pit in phases to reduce the groundwater zone of influence; augmentation of flow in the watercourse using water abstracted from the borrow pit excavation; a wider buffer strip, or shallower batter on the excavations; installation of a groundwater cut off; adoption of wet working techniques that avoid the need for dewatering: and/or 	None required. Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Structure and substrate of the river bed	Localised and temporary excatagricultural land within vicinit (approx.1% of catchment area of direct physical impact on river effects anticipated on structure and bed. No measurable change in	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on river substrate (due to a potential increase in siltation), but no change in quality element when balanced against mitigation embedded in the scheme. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth of 18mbgl). Potential increase in and downstream. No likely effects anticipate structure and substrate of river bed. No measure change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element. Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed many excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed many excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed many excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed many excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed many excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed many excavation depth: 18mbgl). Potential for temporary excavation of area of agricultural land within vicinity of watercourse (assumed many excavation depth: 18mbgl). Potential for temporary exca	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element. Localised and temporary excavation of are agricultural land within vicinity of waterco (approx. 0.6% of catchment area of watercourdirect physical impact on river channel. No leffects anticipated on structure and substrate bed. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (assumed maximum excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on river substrate (due to a potential increase in siltation), but no change in quality element when balanced against mitigation embedded in the scheme.	t on river channel or riparian in river processes upstream kely effects anticipated on of river bed. No measurable uality element. Removal of existing 10m culvert. Localised improvement in structure and substrate of river bed but no change in quality element.	Localised but permanent impro hydromorphology regime. However r anticipated on river processes and substrate of river upstream and do measurable change in quality	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element Element is insensite when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measurable change in quality element.	alised but permanent changes to hydromorphology ime. Localised adverse effects on structure of river ed anticipated, but no change in quality element hen balanced against mitigation embedded in the scheme. Scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measurable change in quality element. Localised but permanent changes to hydromorphology regime. Localised but permanent change in the structure and substrate of river bed when balanced against mit scheme.	Localised but permanent change regime. However negligible effects on structure of river change in quality element tigation embedded in the teme. Element is insensitive to impact processes and structure and upstream and downstream. No quality element processes and structure and upstream and downstream.	to hydromorphology anticipated on river bstrate of river bed neasurable change in nt.	Creation of 60m of new realigned channel, with incorporated hydromorphological improvements (resulting in 5m net gain of river channel). However gligible effect anticipated on structure and substrate river bed. No measurable change in quality element. Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element. Localised and temporary excavation of area of land within vicinity of watercourse. No deport of catchment area of watercourse. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.	No direct physical impact on river channel or riparian agriculties. Potential localised but temporary on river substrate (due to a potential tion), but no change in quality element inst mitigation embedded in the scheme. No direct physical impact on river channel or riparian agricultication impacts on river channel or riparian agricultication impacts on river channel or riparian agricultication impacts on river processes upstream and downstream. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element. Localist agricultication impact on river channel or riparian agricultication. And the scheme in quality element.	Localised and temporary excavation of area of cural land within vicinity of watercourse (assumed maxime excavation depth: 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on river substrate (due to a potential increase in siltation), but no change in quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element. Localised but permanent hydromorphology regime. Localised but permanent on structure of river bed anticipated on a structure of river bed anticipated on structure and substrate of river bed. No measurable change in quality element.	Localised but permanent changes to hyd regime. However negligible effect anticipated, but no change dagainst mitigation cheme. Localised but permanent changes to hyd regime. However negligible effect anticipated processes and structure and substrate upstream and downstream. No measurate quality element.	romorphology pated on river e of river bed able change in	• creation of a new lined channel and temporary diversion. • creation of a new lined channel and temporary diversion.	N/a
Structure of the riparian zone	Localised and temporary excapagricultural land within vicinit (approx. 1% of catchment area of direct physical impact on riparity effects anticipated on structure of measurable change in quality.	ration of area of y of watercourse watercourse). No Element is insensitive to impact an zone. No likely friparian zone. No ty element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). No direct physical impact on riparian zone. No likely effects anticipated on structure of riparian zone. No measurable change in quality element.	Localised and temporary excavation of area agricultural land within vicinity of watercomes (approx. 0.6% of catchment area of watercours direct physical impact on riparian zone. No leffects anticipated on structure of riparian zomeasurable change in quality element.	of se). No Element is insensitive to impact Element is inse	Removal of existing 10m culvert. Localised ensitive to impact improvement in structure of riparian zone, but no change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in riparian zone, but no change in quality element.	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme. Element is insensit	ve to impact Element is insensitive to impact anti balan	Localised but permanent loss of riparian zone. alised adverse effects on structure of riparian zone ticipated, but no change in quality element when anced against mitigation embedded in the scheme.	Localised but permanent Localised adverse effects on anticipated, but no change balanced against mitigation of	Element is insensitive to impact e in quality element when embedded in the scheme. Element is insensitive to impact Element is insensitive to impact Element is insensitive to impact	to impact in	Creation of 60m of new realigned channel, with accorporated riparian improvements (resulting in 5m set gain of river channel). Localised improvement, but no change in quality element. Element is insensitive to impact net gain of river net gain of river no change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 3.2% of catchment area of watercourse). No direct physical impact on riparian zone. No likely effects anticipated on structure of riparian zone. No measurable change in quality element.	Localis agricult (approx. 4 direct ph effects an me	ed and temporary excavation of area of ural land within vicinity of watercourse 8% of catchment area of watercourse). No ysical impact on riparian zone. No likely icipated on structure of riparian zone. No asurable change in quality element.	Localised but permanent loss Localised adverse effects on str zone anticipated, but no change when balanced against mitigatio scheme.	of riparian zone. Cucture of riparian in quality element n embedded in the	act	egligible effect anticipated when scheme component effects onsidered in combination. No measurable change in quality element.	N/a

		iled Impact Asse	essment - Trent	and Mersey Canal, su	ımmit to Alrewas (GB70410142)				Detailed Ir	mpact Assessment							Detailed Impact Assessmer	nt Results		
Water body ID:	GB70410	0142		Watercourse:					Trent and N	Mersey Canal (High)										
Hydromorpholog designation:	zical Artificial	Water Body (AWB)		Scheme component:	WFD-TMC-W-01-01 Viaduct	Borrow pit - Kings Bromley South, located											Additional mitigation requirer	nents		
Overall Status:	Good			Description of scheme component:	Great Haywood Viaduct; Approx. viaduct width: 15m; Approx. viaduct length: 780m; Approx. viaduct height: 16m	Approx. total borrow pit surface area: 0.37km ² ; Assur	ned maximum excavation depth: 18m; Excavation material: sand and gravel; Approx.	distance from borrow pit to canal (at nearest point): 437m	Approx. total borrow pit surface area: 0.16km²; Assumed m	naximum excavation depth: 18m; Excavation material: sand and gravel; App	prox. distance from borrow pit to canal (at nearest point): 790m	Approx. total borrow pit surface area: 0.24km²; Assumed ma	aximum excavation depth: 18m; Excavation material: sand and gravel; App	prox. distance from borrow pit to canal (at nearest point): 500m	Cumulative effects - effects on element from scheme					WFD compliance outcome -
Status Objective	: Good by	2015		Summary of embedded mitigation:	Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce shading impact.	the borrow pit excavation, there is the potential for dewate excavation activities will be required to protect the integrit with the Phase 2a Borrow Pits Agricultural Restoration St	urses and borrow pits. Excavation will not take place in this zone. Depending on the ring and excavation activities to affect watercourse flow regime. Therefore, site invery of these watercourses. Following construction, the areas excavated as borrow pit variety. The materials used to backfill the borrow pit as part of the restoration plan areas excavated as borrow plan are successful.	estigation and monitoring before during and after dewatering will be restored to the existing levels and land use in accordar re assumed to consist of a lower permeability than the currer	borrow pit excavation, there is the potential for dewatering and excavance activities will be required to protect the integrity of these watercour Borrow Pits Agricultural Restoration Strategy. The materials used to ba	vation activities to affect watercourse flow regime. Therefore, site investignses. Following construction, the areas excavated as borrow pit will be rest	gation and monitoring before during and after dewatering and excavation cored to the existing levels and land use in accordance with the Phase 2a cof a lower permeability than the current material. Drainage measures w	borrow pit excavation, there is the potential for dewatering and excavactivities will be required to protect the integrity of these watercour Borrow Pits Agricultural Restoration Strategy. The materials used to ba	In dispersion of the dispersio	gation and monitoring before during and after dewatering and excavation tored to the existing levels and land use in accordance with the Phase 2a tof a lower permeability than the current material. Drainage measures will	component(s) located in other WFD water bodies	Overall effect on element			Residual effects on element	potential for deterioration of current status
WFD Classif	ication Elements		2015 Status	Status Objective	Shading	Footprint	Changes in flow velocity and volume due to dewatering	Changes to water body hydromorphology leading to chain in river processes and habitats upstream and downstream	inges eam	Changes in flow velocity and volume due to dewatering	Changes to water body hydromorphology leading to changes in rive processes and habitats upstream and downstream	Footprint	Changes in flow velocity and volume due to dewatering	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream			Construction	Operation		
ents	Macroph	hytes and Phytobenthos - com	ombined -		Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measurable change in quality element.		Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potentia adverse effects on macrophytes and phytobenthos habitat. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes processes and habitat upstream and downstream. No like effects anticipated on macrophytes and phytobenthos. measurable change in quality element.	s in kely No Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on macrophyte and phytobenthos habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macrophytes and phytobenthos habitat. There is a risk that a change in status could occur	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effects anticipated on macrophytes and phytobenthos. No measurable change in quality. element.	The state of the s	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macrophytes and phytobenthos habitat. There is a risk that a change in status could occ Requires additional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on macrophytes and phytobenthos. No measurable change in quality element.		Adverse effect anticipated when scheme component effect considered in combination. When balanced against mitigation embedded in the scheme, there remains a rist that there could be change in the status of the quality element. Requires additional mitigation.	Additional mitigation measures for the management of groundwater baseflow to the canal during the construction phase may be required to ensure that there is no significant impact on the water environment. Mitigation measures will be designed in detail following ground investigation and	n nt ill	Localised adverse effect anticipated when scheme component effect considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.	al entre ent
ological Quality Eleme	Macroin	vertebrates	-		Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measurable chan in quality element.		Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macroinvertebrate habitat. There is a risk that a change in statucould occur. Requires additional mitigation.	No direct physical impact on channel leading to changes processes and habitat upstream and downstream. No like effects anticipated on macroinvertebrates. No measural change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on macroinvertebrate habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macroinvertebrate habitat. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effects anticipated on macroinvertebrates. No measurable change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on macroinvertebrate habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on macroinvertebrate habitat. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on macroinvertebrates. No measurable change in quality element	None	Adverse effect anticipated when scheme component effect considered in combination. When balanced against mitigation embedded in the scheme, there remains a rist that there could be change in the status of the quality element. Requires additional mitigation.	monitoring of surface water and groundwater levels and in consultation with the Environment Agency. Mitigation could take the form of: • excavation of material from (and backfilling) the borrow pit in phases to reduce the groundwater zone of influence • augmentation of flow in the canal using water abstracted from the borrow pit excavation; • a wider buffer strip, or shallower batter on the	None required	Localised adverse effect anticipated when scheme component effect considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and addition mitigation measures.	Compliant - no change in biological status of water body
Ä	Fish		-		Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measurable change in quality element.		Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fish habitat. There is a risk that a change in status could occur. Requires additional mitigation.	al	s in kely ality Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on fish habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fish habitat. There is risk that a change in status could occur. Requires additional mitigation	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on fish habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fish habitat. There is risk that a change in status could occur. Requires additional mitigation	ntial No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality element n.		Adverse effect anticipated when scheme component effect considered in combination. When balanced against mitigation embedded in the scheme, there remains a rist that there could be change in the status of the quality element. Requires additional mitigation.	excavations; • installation of a groundwater cut off; and/or • adoption of wet working techniques that avoid the need for dewatering.	d	Localised adverse effect anticipated when scheme component effect considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and addition mitigation measures.	cts al
	Dissolved	d oxygen	Good		Some minor, localised and periodic shading of river channel (with potenti associated reduction in photosynthetic activity by aquatic flora). Howeve negligible effect on dissolved oxygen concentrations anticipated. No measurable change in quality element.	er, land within vicinity of canal. No direct physical impact on	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on dissolved oxygen, but no change in quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on channel leading to changes processes and habitat upstream and downstream. No like effect anticipated on dissolved oxygen concentrations. measurable change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects on dissolved oxygen. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects dissolved oxygen, but no change in quality element when balanced again mitigation embedded in the scheme.	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effect anticipated on dissolved oxygen concentrations. No measurable change in qualinate element	s Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects on dissolved oxygen. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects dissolved oxygen, but no change in quality element when balanced again mitigation embedded in the scheme.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effect anticipated on dissolved oxygen concentrations. No measurable change in qualitiest element		Localised adverse effect anticipated when scheme component effects considered in combination. No change quality element when balanced against mitigation embedo in the scheme.	e in ded		N/a	
	рН		High	Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact. No measurable change t quality element	to		N/a	
nical Quality Elements	Phospha	ite	-	-	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised and temporary adverse effects on phosphate concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised and temporary adverse effects phosphate concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	tial on Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised and temporary adverse effects phosphate concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	ntial Element is insensitive to impact	None	Localised adverse effect anticipated when scheme component effects considered in combination. No change quality element when balanced against mitigation embedd in the scheme.	ded None required	None required	N/a	Compliant - no change in physicochemical status of water body
Physicocher	Ammoni	ia	High	Good by 2015	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on ammonia concentrations, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects ammonia concentrations, but no change in quality element when balance against mitigation embedded in the scheme.	Element is insensitive to impact sed	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects ammonia concentrations, but no change in quality element when balan against mitigation embedded in the scheme.	Element is insensitive to impact		Localised adverse effect anticipated when scheme component effects considered in combination. No change quality element when balanced against mitigation embedd in the scheme.	e in ded		N/a	
	Tempera	ature	High		Some minor, localised and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measurable chang in quality element.		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Negligible effect anticipated in when effects considered i combination. No measurable change in quality element	in :		N/a	
Specific Pollutants	Ammoni	ia (Annex 8), Copper, Triclosar	an, Zinc -	Not assessed	N/A - Specific pollutants effects screened out for scheme design component	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects on specific pollutant concentrations, but in change in quality element when balanced against mitigation embedded in the scheme.	No direct physical impact on channel leading to changes processes and habitat upstream and downstream. No lik effects anticipated on specific pollutant concentrations. measurable change in quality element.	s in kely . No	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects specific pollutant concentrations, but no change in quality element who balanced against mitigation embedded in the scheme.	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effects anticipated on specific pollutant concentrations. No measurable change in qualicent.	s d Element is insensitive to impact ty	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential localised but temporary adverse effects specific pollutant concentrations, but no change in quality element whe balanced against mitigation embedded in the scheme.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on specific pollutant concentrations. No measurable change in qualit element.	, None	Localised adverse effect anticipated when scheme component effects considered in combination. No change quality element when balanced against mitigation embedo in the scheme.	e in None required	None required	N/a	Compliant - no change in specific pollutants status of water body
	Quantity	y and dynamics of water flow	N			Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on quantity and dynamics of water flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the quantity and dynamics of water flow. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes processes and habitat upstream and downstream. No like effects anticipated on quantity and dynamics of flow. Measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on quantity and dynamics of water flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the quantity and dynamics of water flow. There is a risk that a change in status could occ Requires additional mitigation.	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effects anticipated on quantity and dynamics of flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on quantity and dynamics of water flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the quantity and dynamics of water flow. There is a risk that a change in status could occ	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on quantity and dynamics of flow. No measurable change in quality element.		Adverse effect anticipated when scheme component effect considered in combination. When balanced against mitigation embedded in the scheme, there remains a rist that there could be change in the status of the quality element. Requires additional mitigation.	k		Localised adverse effect anticipated when scheme component effect considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and addition mitigation measures.	al
ements		ion to groundwater bodies				Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in connection to groundwater bodies as a result of dewatering activities Potential adverse effects on the connection to groundwater bodies. There is a rist that a change in status could occur. Requires additional mitigation.	s. Element is insensitive to impact k	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in connection to groundwater bodies as a result dewatering activities. Potential adverse effects on the connection to groundwater bodies. There is a risk that a change in status could occur Requires additional mitigation.	tial c of Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in connection to groundwater bodies as a resu dewatering activities. Potential adverse effects on the connection to groundwater bodies. There is a risk that a change in status could occur Requires additional mitigation.	ntial It of Element is insensitive to impact		Adverse effect anticipated when scheme component effect considered in combination. When balanced against mitigation embedded in the scheme, there remains a rist that there could be change in the status of the quality element. Requires additional mitigation.	Additional mitigation measures for the management of groundwater baseflow to the canal during the construction phase may be required to ensure that there is no significant impact on the water environment. Mitigation measures wi	n nt ill	Localised adverse effect anticipated when scheme component effect considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and addition mitigation measures.	al entre ent
gical Quality El	River co	ntinuity	_	Not assessed	N/A - Hydromorphology effects screened out for scheme design component	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effect anticipated on river continuity. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effect anticipated on river continuity. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effect anticipated on river continuity. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	None	No effect anticipated in when effects considered in combination. No measurable change in quality element	be designed in detail following ground investigation and monitoring of surface water and groundwater levels and ir consultation with the Environment Agency. Mitigation could take the form of: • excavation of material from (and backfilling) the borrow pit in phases to reduce the groundwater zone of influence	None required	N/A	Compliant - no change in hydromorphological status of water body
Hydromorpholo	River de	pth and width variation				Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effect on river depth and width variation. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the river depth and width variation. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes processes and habitat upstream and downstream. No like effects anticipated on river depth and variation. No measurable change in quality element.	s in Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effect on river depth and width variation. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the river depth and width variation. There is a risk that a change in status could occur. Requiadditional mitigation.	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effects anticipated on river depth and variation. No measurable change in quality element	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effect on river depth and width variation. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on the river depth and width variation. There is a risk that a change in status could occur. Requadditional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on river depth and variation. No measurable change in quality element		Adverse effect anticipated when scheme component effect considered in combination. When balanced against mitigation embedded in the scheme, there remains a rist that there could be change in the status of the quality element. Requires additional mitigation.	 augmentation of flow in the canal using water abstracted from the borrow pit excavation; a wider buffer strip, or shallower batter on the excavations; installation of a groundwater cut off; and/or adoption of wet working techniques that avoid the need for dewatering. 	d d	Localised adverse effect anticipated when scheme component effect considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and addition mitigation measures.	al .
		e and substrate of the river be	bed			Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Potential for temporary reduction in flow regime downstream as a result of dewatering activities. However negligible effect anticipated on substrate. No measurable change in quality element.	No direct physical impact on channel leading to changes processes and habitat upstream and downstream. No like effects anticipated on structure and substrate of river bed measurable change in quality element.	s in kely d. No No No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poten for temporary reduction in flow regime downstream as a result of dewatering activities. However negligible effect anticipated on substrat No measurable change in quality element.	No direct physical impact on channel leading to changes in processe and habitat upstream and downstream. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of canal (assumed maximum excavation depth of 18mbgl). Poter for temporary reduction in flow regime downstream as a result of dewatering activities. However negligible effect anticipated on substra No measurable change in quality element.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on structure and substrate of river bed. No measurable change in quality element.		Negligible effect anticipated in when effects considered i combination. No measurable change in quality element	in :		N/A	
		e of the riparian zone				Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on structure of riparian zone. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on structure of riparian zone. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of canal. No direct physical impact on channel or riparian zone. No likely effects anticipated on structure of riparian zone. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact		No effect anticipated in when effects considered in combination. No measurable change in quality element			N/A	

Table 8: Revised Detailed Impact Assessment - Trent from Moreton Brook to River Tame (GB104028047290)

Table 8: Revised Detailed Impact Assessment - Trent from Surface water body: Trent from Moreton Brook to River Tame	om Moreton Brook to River Tame (GB10402804	047290)															Detailed Impa	ct Assessment																		Detai	led Impact Assessment Results	
Water body ID: GB104028047290 Watercourse (EIA recept	eptor value):		Unna	ned tributary of River Trent 1 (MB t	RT) (Moderate)				Unnam	named tributary of River Trent 2 (MB t	to RT) (Moderate)			Riv	er Trent (Very high)										Unnamed tributary of B	entley Brook 2 (Moderate)												
Hydromorphological Not A/HMWB Scheme of	Component: WFD-TMT-T-01-01 Viaduct Pivor Tront Viaduct: Approx, viaduct width: 15 m.		WFD-TMT-T-01-02 Diversion		Borrow pit - Ki	WFD-BP03 ngs Bromley North, located adjacent to	the realigned Shaw Lane	WFD-TMT-T-02-01 Viaduct		Borrow pit - Kings Bromley N	WFD-BP03 North, located adjacent to the realigne	ned Shaw Lane	WFD-TMT-W-01-01 Viaduct	Borrow	WFD-BP04 v pit - Blithbury, located to the north of the R	River Trent viaduct		WFD-TMT-T-05-01 Highway realignment culvert		Realignment (w	WFD-TMT-T-05-02 th associated removal of existing culver	rt; see WFD-TMT-T-05-03)	Removal of existing h	WFD-TMT-T-05-03 ghway culvert (with associated realignmen	ent; see WFD-TMT-T-05-02)		WFD-TMT-T-05-04 Daylighting (of existing culvert)		Highway realignme	WFD-TMT-T-05-05 ent culvert (on daylighted channel; see	WFD-TMT-T-05-04)		WFD-TMT-T-05-06 Access road culvert		Cumulative effects - effects		Additional mitigation requirements	WFD compliance
Overall Status: Poor Description of scheme of	component: Approx. viaduct length: 1900m; Approx. viaduct height: 14m Clear span viaduct. Viaducts designed to cross and incorporate and in	Approx. total length of new div	erted channel: 55m; Approx. total length of existing chan-	nel will also ensure the equivalent hydraulic capac	Approx. total borrow pit surface area: 0.24km²; Assur (at A 50m buffer zone is incorporated between nearby wa between a watercourse and the borrow pit excavation and monitoring before during and after dewatering	need maximum excavation depth: 18m; Excavation material nearest point): 225m; Approx. total catchment area of watercourses and borrow pits. Excavation will not take place there is the potential for dewatering and excavation actional and excavation activities will be required to protect the	I: sand and gravel; Approx. distance from borrow pit to tercourse: 2.7km ² In this zone. Depending on the permeability of the unvities to affect watercourse flow regime. Therefore, site ntegrity of these watercourses. Following construction	watercourse River Trent Viaduct; Approx. viaduct width: 15r length: 1900m; Approx. viaduct heig erlying strata investigation the areas	Approx. total borrow pit surfatht: 14m A 50m buffer zone is incorporate watercourse and the borrow pit surfather.	rporated between nearby watercourses and borrow pit excavation, there is the potential for dewatering	its. Excavation will not take place in this zone. Depending and excavation activities to affect watercourse flow retained to the contract of t	ding on the permeability of the underlying strata between a regime. Therefore, site investigation and monitoring before	Approx. viaduct length: 1900m; Approx. viaduct hei 14m Clear span viaduct. Viaducts designed to cross	Approx. total borrow pit surface area: 0.25km2; Ass nearest po A 50m buffer zone is incorporated between nearby between a watercourse and the borrow pit excavation and after developing and	sumed maximum excavation depth: 15m; Excavation material: sa int): 60m; Approx. total catchment area of watercourse (within we watercourses and borrow pits. Excavation will not take place in on, there is the potential for dewatering and excavation activities appropriate protect the integrity of the protect the protect the protect the integrity of the protect the	and and gravel; Approx. distance from borrow pit to waterco water body extent): 36.6km2 In this zone. Depending on the permeability of the underlying so to affect watercourse flow regime. Therefore, site investigations watercourses.	strata tion and Culvert length has been reduced as far as reason	Approx. culvert length: 10m; Approx. culvert diameter: ably practicable. Invert of culvert to be buried 300mm bel	ow the existing bed level to reduce disruption to sedime	ent The length of watercourse realignments has	Om; Approx. total length of existing channel: 140m (120m channel: 30m een reduced as far as reasonably practicable. Design of	the new channel will also ensure the equivalent hydraulic	Approx. existing	ulvert length: 20m; Approx. existing culvert dimensions: unkn	cnown (restricted access)	Approx. existing culvert length: 250m; Approx. exis	ting culvert dimensions: suspected 1.2m diameter pipe (ac daylighted channel: 180m	access restricted to culvert outlet only); Length of new	Approx. culvert length: 60m; Approx. culvert dimensions Culvert length has been reduced as far as reasonably p	Proposed Scheme, see WFD-TMT-T-05-04) practicable. Invert of culvert to be buried 300mm below	the existing bed level to reduce disruption to sediment	t Culvert length has been reduced as far as reasonal	Approx. culvert length: 10m; Approx. culvert diameter: 0.9r	w the existing bed level to reduce disruption to sediment	on element from scheme component(s) located in other WFD water bodies	Overall effect on element		Residual effects on outcome - potential for deterioration of current status
Status Objective: Good by 2027 Summary of embedded	perpendicular to river channel wherever possible to hydromorp drainage fu	orphological condition over the existing co functions). In addition, the design of the n	ew channel will allow for a 10m wide buffer zone for the	npatible with the watercourses' flood risk and land applementation of marginal/riparian improvements.	excavated as borrow pit will be restored to the exist backfill the borrow pit as part of the restoration pl	ng levels and land use in accordance with the Phase 2a E in are assumed to consist of a lower permeability than the groundwater levels and to sustain baseflow to the wa	corrow Pits Agricultural Restoration Strategy. The mate e current material. Drainage measures will be designe tercourse. Changes to water body hydromorphole	river channel wherever possible to reduce s	the existing levels and land us assumed to consist of a l	of a lower permeability than the current material. Drai	Agricultural Restoration Strategy. The materials used to linage measures will be designed to control groundwate	o backfill the borrow pit as part of the restoration plan are ter levels and to sustain baseflow to the watercourse .	perpendicular to river channel wherever possible reduce shading impact.	borrow pit will be restored to the existing levels and than the current material. Dr	land use. The materials used to backfill the borrow pit as part of rainage measures will be designed to control groundwater levels	f the restoration plan are assumed to consist of a lower per and to sustain baseflow to the watercourse . Changes to water body hydromorphology le	meability Environment Agency guidance and to ensure approriver channel im	opriate low flow water depths and velocities for fish passa mediately upstream and downstream of the culvert to com	ge. Hydromorphological improvements to be undertaker pensate for footprint loss. Changes to water body hydromorphology leading	en to enhance hydromorphological condition over t land drainage functions). In addition, the desig	e existing condition where reasonably practicable (provior the new channel will allow for a 10m wide buffer zone Changes to water body hydromorphology leading	ided this is compatible with the watercourses' flood risk a e for the implementation of marginal/riparian improvements	nd nts.	TMT-T-05-02)	Changes to water body hydromorphology leading to	Reinstatement of river	channel form, equivalent to reaches upstream and downst	Changes to water body hydromorphology leading to	Environment Agency guidance and to ensure appropriate river channel immedia:	te low flow water depths and velocities for fish passage. ately upstream and downstream of the culvert to compen	Hydromorphological improvements to be undertaken to sate for footprint loss. Changes to water body hydromorphology leading to	Environment Agency guidance and to ensure appropria river channel immed	e low flow water depths and velocities for fish passage. ately upstream and downstream of the culvert to comper	lydromorphological improvements to be undertaken to sate for footprint loss. Changes to water body hydromorphology leading to			Construction Operation	
WFD Classification Elements 2015 Status Ob	ojective Shading	Footprint	changes in river processes and habitats upstream and downstream	Creation of new habitats	Footprint	Changes in flow velocity and volume due to dev	vatering changes in river processes and habitats downstream	gy leading to upstream and Shading	Foot	Footprint Changes in t	flow velocity and volume due to dewatering Chai	river processes and habitats upstream and downstream	Shading	Footprint	Changes in flow velocity and volume due to dewater	changes in river processes and habitats upstr	eam and Footprint	Shading	changes in river processes and habitats upstream a downstream	and Footprint	changes in river processes and habitats upstream downstream	n and Creation of new habitats	Footprint	Shading	changes in river processes and habitats upstream an downstream	d Footprint	Shading				changes in river processes and habitats upstream and downstream Watercourse is currently culverted for 250m below	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream				
Macrophytes and Phytobenthos - combined Moderate Good by 2027	Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measurable change in	of 55m of new channel, with incorporated chological and riparian/marginal habitat ments (resulting in 5m net gain of river ocalised improvement in macrophytes and enthos habitat, but no change in quality element.	hydromorphological regime. However negligible effect anticipated on river processes and macrophytes and	Creation of 55m of new channel, with incorporate hydromorphological and riparian/marginal habit improvements (resulting in 5m net gain of river channel). Localised improvement in macrophytes a phytobenthos habitat, but no change in quality element.	land outside of watercourse catchment area. No dire	Localised and temporary excavation of area of agri- outside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for temporal in flow regime as a result of dewatering activities adverse effects on macrophytes and phytobenthom. There is a risk that a change in status could occur additional mitigation.	No direct physical impact on channe changes in processes and habitat up downstream. No likely effects antic macrophytes and phytobenthos. No mea in quality element.	leading to tream and pated on turable change anticipated. No measurable change in qua	Localised and temporary excava outside of watercourse catch impact on channel or riparian zo on macrophyte and phytoben change in qua	Localised and te outside of war excavation of area of agricultural land exchment area. No direct physical excavation dept in flow regime adverse effect a quality element. Localised and te outside of war excavation dept in flow regime adverse effect adverse effect. There is a risk	temporary excavation of area of agricultural land attercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction ne as a result of dewatering activities. Potential ects on macrophytes and phytobenthos habitat. sk that a change in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on macrophytes and phytobenthos. No measurable change in quality element.	Some minor, localised and periodic shading of richannel. However negligible effect on macrophytes phytobenthos anticipated. No measurable change quality element.	ver and e in Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel or ripariar zone. No likely effects anticipated on macrophyte an phytobenthos habitat. No measurable change in qualicular element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential adverse effects on macro phytobenthos habitat. There is a risk that a change in status (Requires additional mitigation.	land within th: 15mbgl). m as a result changes in river processes and habitat upstr downstream. No likely effects anticipate macrophytes and phytobenthos. No measurable in quality element.	Localised but permanent loss of open river habit localised adverse effects on macrophytes and phytobenthos anticipated, but no change in qual element when balanced against mitigation embed in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes at phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedding the scheme.	Localised but permanent changes to hydromorphol regime. However negligible effect anticipated on riprocesses and macrophytes and phytobenthos hab upstream and downstream of culvert. No measura change in quality element.	clogy incorporated hydromorphological and riparian/marginal habitat improvements (resul 30m net gain of open river channel). Localis improvement in macrophytes and phytobent habitat, but no change in quality element	Localised but permanent change to hydromorphological regime. However negligible anticipated on river processes and macrophytes phytobenthos habitat upstream and downstream measurable change in quality element.	creation of 150m of new realigned channel, wit incorporated hydromorphological and riparian/marginal habitat improvements (resultin 30m net gain of open river channel). Localised improvement in macrophytes and phytobenthohabitat, but no change in quality element.	Removal of existing 20m culvert. Localised bu	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macrophyte and phytobenthos habitat anticipated, but no change in quality element.	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and macrophyte and phytobenthos habitat upstream and downstream. No measurable change in quality element.	Removal of existing 250m culvert. Localised but permanent increase in open river habitat. Localised improvement in macrophyte and phytobenthos habita anticipated, but no change in quality element.	Removal of existing 250m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macrophyte and phytobenthos habitat anticipated, but no change in quality element.	hydromorphology regime. However negligible effect anticipated on river processes and macrophyte and	Watercourse is currently culverted for 250m below agricultural fields at this location. New culvert to comprise larger dimensions, invert to be buried below river bed to allow for build up natural substrate, and design of culvert to ensure minimised impact on flow, sediment and biological continuity. Localised improvement in macrophyte and phytobenthos habitat, but no change in quality element.	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on macrophyte and phytobenthos habitat. No measurable change in quality element.	agricultural fields at this location. Design of culvert to ensure minimised impact on flow, sediment and biological continuity). Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and macrophyte and phytobenthos habitat upstream and downstream. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedde in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedde in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element.	y com What in the	Adverse effect anticipated when scheme imponent effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation. Additional management is a provided in the scheme in the status of the quality element. Requires additional mitigation.	onal mitigation measures for the ent of groundwater baseflow to the ok and Crawley Brook watercourses onstruction phase will be required to there is no significant impact on the	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Macroinvertebrates Good Good by 2015	Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measurable change in quality element. Creation of 5 hydromorpho improvement channel. Local habitat,	of 55m of new channel, with incorporated phological and riparian/marginal habitat ments (resulting in 5m net gain of river calised improvement in macroinvertebrate at, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element.	Creation of 55m of new channel, with incorporate hydromorphological and riparian/marginal habit improvements (resulting in 5m net gain of river hannel). Localised improvement in macroinverteb habitat, but no change in quality element.	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. No like effects anticipated on macroinvertebrate habitat. No measurable change in quality element.	Localised and temporary excavation of area of agrioutside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for tempora in flow regime as a result of dewatering activities adverse effects on macroinvertebrate habitat. There a change in status could occur. Requires additional	No direct physical impact on channe changes in processes and habitat up downstream. No likely effects antic macroinvertebrates. No measurable changes in processes and habitat up downstream. No likely effects antic macroinvertebrates. No measurable changes in processes and habitat up downstream.	leading to tream and pated on nge in quality Some minor, localised and periodic shading and pated and periodic shading and periodic sh	Localised and temporary excava outside of watercourse catch impact on channel or riparian zo on macroinvertebrate habitat. Nelem	cavation of area of agricultural land outside of war atchment area. No direct physical and zone. No likely effects anticipated at. No measurable change in quality element. Localised and te outside of war ackayation dept in flow regime adverse effects of a change in sta	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum problem of 18mbgl). Potential for temporary reduction problem as a result of dewatering activities. Potential on macroinvertebrate habitat. There is a risk that atus could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on macroinvertebrates. No measurable change in quality element	in Some minor, localised and periodic shading of rively channel. However negligible effect on macroinvertebrates anticipated. No measurable chin quality element.	ver ange Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects anticipated on macroinvertebrate habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential adverse effects on macroi habitat. There is a risk that a change in status could occur. additional mitigation.	land within th: 15mbgl). mas a result invertebrate . Requires No direct physical impact on river channel or zone leading to changes in river processes an upstream and downstream. No likely eff anticipated on macroinvertebrates. No meaning the change in quality element	Localised but permanent loss of open river habit Localised adverse effects on macroinvertebrate anticipated, but no change in quality element will balanced against mitigation embedded in the schell	Localised but permanent shading of section of riversets. channel. Localised adverse effects on macroinvertebrates anticipated (including due to reduction in/loss of riparian and aquatic vegetation but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphol regime. However negligible effect anticipated on riprocesses and macroinvertebrate habitat upstrea and downstream of culvert. No measurable change quality element.	Creation of 150m of new realigned channel, we incorporated hydromorphological and riparian/marginal habitat improvements (resulting and net gain of open river channel). Localist improvement in macroinvertebrate habitat, but change in quality element.	Localised but permanent change to hydromorphological regime. However negligible anticipated on river processes and macroinverte habitat upstream and downstream. No measure change in quality element.	Creation of 150m of new realigned channel, wit incorporated hydromorphological and riparian/marginal habitat improvements (resultin 30m net gain of open river channel). Localised improvement in macroinvertebrate habitat, but in change in quality element.	Removal of existing 20m culvert. Localised but permanent increase in open river habitat. Localised but improvement in macroinvertebrate habitat anticipo but no change in quality element.	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macroinvertebrate habitat anticipated (including due to a increase in riparian and aquatic vegetation), but no change in quality element.	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebra habitat upstream and downstream. No measurable change in quality element.	Removal of existing 250m culvert. Localised but permanent increase in open river habitat. Localised improvement in macroinvertebrate habitat anticipated but no change in quality element.	Removal of existing 250m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macroinvertebrate habitat anticipated (including due to a increase in riparian and aquatic vegetation), but no change in quality element.	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element.	Watercourse is currently culverted for 250m below agricultural fields at this location. New culvert to comprise larger dimensions, invert to be buried below river bed to allow for build up natural substrate, and design of culvert to ensure minimised impact on flow, sediment and biological continuity. Localised improvement for macroinvertebrate habitat, but no change in quality element.	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on macroinvertebrate habitat. No measurable change in quality element.	Watercourse is currently culverted for 250m below agricultural fields at this location. Design of culvert to ensure minimised impact on flow, sediment and biological continuity. Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element wher balanced against mitigation embedded in the schem m.	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrates anticipated (including due to a reduction in/loss of riparian and aquatic vegetation but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quality element.	None - water bodies upstream affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate downstream and affect water body (e.g. restrictive structures significantly affecting flow regime, sediment transfer or biological continuity)	water environce designed in combination. Adverse effect anticipated when scheme and monitorion levels and in Agency. Note that there could be change in the status of the quality element. Requires additional mitigation. water environce and monitorion levels and in Agency. Note that there could be change in the status of the quality element. Requires additional mitigation. • augmentat water abstraction water abstraction and monitorion levels and in Agency. Note that there are could be change in the status of the quality element. Requires additional mitigation.	onment. Mitigation measures will be detail following ground investigation ing of surface water and groundwater n consultation with the Environment Mitigation could take the form of: of material from (and backfilling) the in phases to reduce the groundwater zone of influence; tion of flow in the watercourse using acted from the borrow pit excavation; uffer strip, or shallower batter on the	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures. Compliant - no change in biological status of water body
Fish Poor Good by 2027	Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measurable change in quality element. Creation of 5 hydromorpho improveme channel. Local fish passages.	of 55m of new channel, with incorporated phological and riparian/marginal habitat ments (resulting in 5m net gain of river ocalised improvement in fish habitat and sage, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element.	Creation of 55m of new channel, with incorporate hydromorphological and riparian/marginal habit improvements (resulting in 5m net gain of river channel). Localised improvement in fish habitat a fish passage, but no change in quality element.	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. No like effects anticipated on fish habitat. No measurable chain quality element.	Localised and temporary excavation of area of agricultural outside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for temporal in flow regime as a result of dewatering activities adverse effects on fish habitat. There is a risk that status could occur. Requires additional mitig	naximum ry reduction . Potential a change in ation. No direct physical impact on channe changes in processes and habitat up downstream. No likely effects anticipat measurable change in quality ele	leading to tream and don fish. No ment Some minor, localised and periodic shading the However negligible effect on fish anticipated change in quality element.	of river channel. No measurable Localised and temporary excava outside of watercourse catch impact on channel or riparian zo on fish habitat. No measurab	Localised and te outside of war excavation of area of agricultural land atchment area. No direct physical an zone. No likely effects anticipated urable change in quality element. Localised and te outside of war excavation depting in flow regime adverse effects status co	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum poth of 18mbgl). Potential for temporary reduction properties a result of dewatering activities. Potential effects on fish habitat. There is a risk that a change in could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on fish. No measurable change in quality element	Some minor, localised and periodic shading of riversity Some minor, localised and periodic shading of riversity channel. However negligible effect on fish anticipa No measurable change in quality element.	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel or ripariar zone. No likely effects anticipated on fish habitat. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential adverse effects on fish ha is a risk that a change in status could occur. Requires add mitigation.	land within th: 15mbgl). m as a result abitat. There ditional No direct physical impact on river channel or zone leading to changes in river processes an upstream and downstream. No likely eff anticipated on fish. No measurable change in element	Localised but permanent loss of open river habit Localised adverse effects on fish anticipated, but change in quality element when balanced again mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change if quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphol regime. However negligible effect anticipated on riprocesses and fish habitat upstream and downstre of culvert. No measurable change in quality eleme	Creation of 150m of new realigned channel, voltage incorporated hydromorphological and riparian/marginal habitat improvements (resulting 30m net gain of open river channel). Localis improvement in fish habitat, but no change in celement.	Localised but permanent change to hydromorphological regime. However negligible anticipated on river processes and fish habit upstream and downstream. No measurable chan quality element.	Creation of 150m of new realigned channel, wit incorporated hydromorphological and riparian/marginal habitatimprovements (resultin 30m net gain of open river channel). Localised improvement in fish habitat, but no change in quaelement.	Removal of existing 20m culvert. Localised but permanent increase in open river habitat. Locali improvement in fish habitat, but no change in quality	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in fish habitat anticipated (including due to a increase in riparian and aquatic vegetation), but no change in quality element.	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change i quality element.	Removal of existing 250m culvert. Localised but permanent increase in open river habitat. Improvemen in fish passage also due to length of culvert to be removed. Localised improvement in fish habitat, but no change in quality element.	Removal of existing 250m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in fish habitat anticipated (including due to a increase in riparian and aquatic vegetation), but no change in quality element.	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element.	Watercourse is currently culverted for 250m below agricultural fields at this location. New culvert to comprise larger dimensions, invert to be buried below river bed to allow for build up natural substrate, and design of culvert to ensure minimised impact on flow, sediment and biological continuity. Localised minor improvement for fish habitat, but no change in quality element.	Watercourse is currently culverted below agricultural fields at this location. Watercourse scoped out by fish baseline assessment due to poor habitat potential. No effect anticipated on fish habitat. No measurable change in quality element.	Watercourse is currently culverted for 250m below agricultural fields at this location. Design of culvert to ensure minimised impact on flow, sediment and biological continuity. Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measurable change in quality element.	y com Whe	Adverse effect anticipated when scheme mponent effects considered in combination. Then balanced against mitigation embedded to the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	excavations; Ilation of a groundwater cut off; wet working techniques that avoid the eed for dewatering; and/or f a new lined channel and temporary diversion.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Dissolved oxygen High Good by 2015	Some minor, localised and periodic shading of river channel (with potential associated reduction in photosynthetic activity by aquatic flora). However, negligible effect on dissolved oxygen concentrations anticipated. No measurable change in quality element.	of 55m of new channel, with incorporated phological and riparian/marginal habitat ments (resulting in 5m net gain of river However negligible effect anticipated on doxygen concentrations. No measurable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstream and downstream. No measurable change in quality element.	Creation of 55m of new channel, with incorporate hydromorphological and riparian/marginal habit improvements (resulting in 5m net gain of river channel). However negligible effect anticipated or dissolved oxygen concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. No like effects on dissolved oxygen. No measurable change quality element.	Localised and temporary excavation of area of agricultural outside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for temporal in flow regime as a result of dewatering activities localised but temporary adverse effects on dissolution but no change in quality element when balance mitigation embedded in the scheme.	Cultural land maximum ry reduction . Potential ved oxygen, d against No direct physical impact on channe changes in processes and habitat up downstream. No likely effect anticipated oxygen concentrations. No measurab quality element	leading to tream and on dissolved e change in Some minor, localised and periodic shading (with potential associated reduction in photo by aquatic flora). However, negligible effect on concentrations anticipated. No measurable of element.	of river channel synthetic activity dissolved oxygen change in quality Localised and temporary excava outside of watercourse catch impact on channel or ripari dissolved oxygen. No measura	Localised and te outside of war excavation of area of agricultural land atchment area. No direct physical parian zone. No likely effects on surable change in quality element.	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction are as a result of dewatering activities. Potential temporary adverse effects on dissolved oxygen, ange in quality element when balanced against initigation embedded in the scheme.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effect anticipated on dissolved oxygen concentrations. No measurable change in quality element	Some minor, localised and periodic shading of riversely photosynthetic activity by aquatic flora). However, negligible effect on dissolved oxygen concentration anticipated. No measurable change in quality elem	Localised and temporary loss of area of agricultura land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effects on dissolved oxygen. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential localised but temporary effects on dissolved oxygen, but no change in quality elem balanced against mitigation embedded in the scheme	land within th: 15mbgl). mas a result y adverse tent when me. No direct physical impact on river channel or zone leading to changes in river processes used and downstream. No likely effect anticipations dissolved oxygen concentrations. No measurement.	riparian pstream ted on Element is insensitive to impact surable	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localise impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora) Localised adverse effects anticipated, but no change quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphol regime. However negligible effect anticipated on riprocesses and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	Creation of 150m of new realigned channel, of incorporated hydromorphological and riparian/marginal habitat improvements (resulting 30m net gain of open river channel). However, negligible effect anticipated on dissolved oxy concentrations. No measurable change in quality element.	ith Localised but permanent change to ng in hydromorphological regime. However negligible of anticipated on river processes and dissolved ox concentrations upstream and downstream. No ity measurable change in quality element.	Creation of 150m of new realigned channel, wit incorporated hydromorphological and riparian/marginal habitatimprovements (resultin 30m net gain of open river channel). However negligible effect anticipated on dissolved oxyge concentrations. No measurable change in qualit element.	eh Element is insensitive to impact	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in dissolved oxygen concentrations (due to increased photosynthetic activity by aquatic flora), but no change in quality element.	Localised but permanent changes to hydromorphologous regime. However negligible effect anticipated on rive processes and dissolved oxygen concentrations upstream and downstream. No measurable change in quality element.	EV r Element is insensitive to impact	Removal of existing 250m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in dissolved oxygen concentrations (due to increased photosynthetic activity by aquatic flora), but no change in quality element.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstream and downstream. No measurable change in quality element.	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on dissolved oxygen. No measurable change in quality element.	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	rt. Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	y Lo so coi whe	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element then balanced against mitigation embedded in the scheme.		N/a
pH High Good by 2015	Element is insensitive to impact Element	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to imp	Element is insensitive to impa	ct Element is inser	nsensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact. No measurable change to quality element		N/a
Phosphate Poor Good by 2021	Element is insensitive to impact Eler	Element is insensitive to impact	Element is insensitive to impact	Creation of 55m of new channel, with incorporate hydromorphological and riparian/marginal habit improvements (resulting in 5m net gain of river channel). Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. Localis and temporary reduction in agricultural activity, wi potential associated reductions in application of org and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measur change in quality element.	Localised and temporary excavation of area of agricoutside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for tempora in flow regime as a result of dewatering activities localised and temporary adverse effects on phoconcentrations, but no change in quality element wagainst mitigation embedded in the schero	cultural land maximum ry reduction . Potential cosphate nen balanced ne.	ect Element is insensitive to impa	Localised and temporary excava outside of watercourse catch impact on channel or riparian reduction in agricultural active reductions in application of our However negligible effect concentrations. No measurable	cavation of area of agricultural land atchment area. No direct physical rian zone. Localised and temporary activity, with potential associated of organic and inorganic fertilizer. fect anticipated on phosphate curable change in quality element.	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction he as a result of dewatering activities. Potential and temporary adverse effects on phosphate, but no change in quality element when balanced st mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.4% of catchment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential localised and temporar effects on phosphate concentrations, but no change in quali when balanced against mitigation embedded in the sch	land within th: 15mbgl). m as a result ry adverse ity element heme. Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 150m of new realigned channel, wit incorporated riparian/marginal habitat improvem (resulting in 30m net gain of open river channel Potential localised reductions in fine sediment in and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	ch nents l). puts Element is insensitive to impact t	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	None - water bodies upstream affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate downstream and affect water body (e.g. restrictive structures	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required None required	N/a Compliant - no change in physicochemical status of water body
Ammonia Good Good by 2015	Element is insensitive to impact Element	Element is insensitive to impact	Element is insensitive to impact	Creation of 55m of new channel, with incorporate hydromorphological and riparian/marginal habit improvements (resulting in 5m net gain of river channel). Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. Localis and temporary reduction in agricultural activity, wi potential associated reductions in application of organd inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measure change in quality element.	Localised and temporary excavation of area of agricultied outside of watercourse catchment area (assumed excavation depth of18mbgl). Potential for tempora in flow regime as a result of dewatering activities localised but temporary adverse effects on an concentrations, but no change in quality element wagainst mitigation embedded in the schero	cultural land maximum ry reduction . Potential monia nen balanced ne.	Element is insensitive to impa	Localised and temporary excava outside of watercourse catch impact on channel or riparian reduction in agricultural active reductions in application of outside the concentrations. No measurals	cavation of area of agricultural land atchment area. No direct physical rian zone. Localised and temporary activity, with potential associated of organic and inorganic fertilizer. Iffect anticipated on ammonia curable change in quality element.	temporary excavation of area of agricultural land attercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction he as a result of dewatering activities. Potential but temporary adverse effects on ammonia, but no change in quality element when balanced st mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential localised but temporary effects on ammonia concentrations, but no change in qualit when balanced against mitigation embedded in the sch	land within th: 15mbgl). m as a result ry adverse ty element heme. Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 150m of new realigned channel, wit incorporated riparian/marginal habitat improvem (resulting in 30m net gain of open river channel Potential localised reductions in fine sediment in and nutrient loading. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	ch nents). puts Element is insensitive to impact t	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	sediment transfer) Lo se whe	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Temperature High Good by 2015	Some minor, localised and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to imp	Some minor, localised and periodic shading of the state o	of river channel. re anticipated. No Element is inser nent.	nsensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Some minor, localised and periodic shading of rive channel. However, negligible effect on water temperature anticipated. No measurable change quality element.	ver in Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localise impact on water temperature. Localised adverse effect anticipated, but no change in quality element whe balanced against mitigation embedded in the scheme	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in water temperature, but no change in quality element.	n Element is insensitive to impact	Element is insensitive to impact	Removal of existing 250m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in water temperature, but no change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on water temperature. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effect anticipated, but no change in quality element when balanced against mitigation embedded in the schem	Element is insensitive to impact	Lo so coi whe	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Copper, Triclosan, Zinc High High by 2015	N/A - Specific pollutants effects screened out for scheme component	N/A -	Specific pollutants effects screened out for scheme com	nent	Element is insensitive to impact	Localised and temporary excavation of area of agricultion of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for tempora in flow regime as a result of dewatering activities localised but temporary adverse effects on specific concentrations, but no change in quality element wagainst mitigation embedded in the scheme	cultural land maximum ry reduction . Potential c pollutant nen balanced ne. No direct physical impact on channe changes in processes and habitat up downstream. No likely effects anticipat pollutant concentrations. No measura quality element.	leading to tream and d on specific le change in	out for scheme Element is inser	Localised and te outside of war excavation dept in flow regime localised but to concentrations, agains	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction properties as a result of dewatering activities. Potential temporary adverse effects on specific pollutant, but no change in quality element when balanced st mitigation embedded in the scheme.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on specific pollutant concentrations. No measurable change in quality element.	in ely N/A - Specific pollutants effects screened out fo scheme component	er Element is insensitive to impact	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstream of dewatering activities. Potential localised but temporary effects on specific pollutant concentrations, but no change element when balanced against mitigation embedded in the	land within th: 15mbgl). mas a result y adverse e in quality he scheme. No direct physical impact on river channel or zone leading to changes in river processes u and downstream. No likely effects anticipa specific pollutant concentrations. No means change in quality element.	riparian pstream ited on surable	N/A - Specific pollutants effects screened out for scheme c	mponent		N/A - Specific pollutants effects screened out for scheme	e component		N/A - Specific pollutants effects screened out for scheme com	nponent	N/A	- Specific pollutants effects screened out for scheme compo	nponent	N/A - S	Specific pollutants effects screened out for scheme comp	onent	N/A	'A - Specific pollutants effects screened out for scheme comp	ponent	None con whe	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required None required	Compliant - no change in Specific pollutant status of water body
Quantity and dynamics of water flow	Creation of 5 hydromorpholo gain of river of dynamics	of 55m of new channel, with incorporated ological improvements (resulting in 5m ner channel). Localised improvement in flow sics, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element.	Element is insensitive to impact	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. No like effects anticipated on quantity and dynamics of wat flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultation of area of agricultation outside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for temporation flow regime as a result of dewatering activities adverse effects on the quantity and dynamics of the temporation of area of agricultation of the temporation of the temp	No direct physical impact on channe changes in processes and habitat up downstream. No likely effects anticipate and dynamics of flow. No measurable chement.	leading to tream and d on quantity ange in quality	Localised and temporary excava outside of watercourse catch impact on channel or riparian zo on quantity and dynamics of wa in quality	Localised and te outside of war excavation of area of agricultural land atchment area. No direct physical an zone. No likely effects anticipated if water flow. No measurable change adverse effect ality element. Localised and te outside of war excavation dept in flow regime adverse effect adverse effect. There is a risk	remporary excavation of area of agricultural land attercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction ne as a result of dewatering activities. Potential cts on the quantity and dynamics of water flow. sk that a change in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely effects anticipated on quantity and dynamics of flow. No measurable change in quality element.	in ely o	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on quantity and dynamics of water flow. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential adverse effects on the quiter dynamics of water flow. There is a risk that a change in status Requires additional mitigation.	land within th: 15mbgl). m as a result anntity and scould occur. No direct physical impact on river channel or zone leading to changes in river processes u and downstream. No likely effects anticipa quantity and dynamics of flow. No measurab in quality element.	Localised but permanent changes to hydromorphore regime. Localised adverse effects on flow dynam (including potential localised increases in flow velocity) anticipated, but no change in quality elements when balanced against mitigation embedded in scheme.	logy ics v nent the	Localised but permanent changes to hydromorphol regime. However negligible effect anticipated on riprocesses and quantity and dynamics of flow upstrand downstream. No measurable change in qualitelement.	Creation of 150m of new realigned channel, viver incorporated hydromorphological improvem (resulting in 30m net gain of open river channel) Localised improvement in flow dynamics, but change in quality element.	Localised but permanent change to hydromorphological regime. However negligible anticipated on river processes and quantity and dynamics of flow upstream and downstream. I measurable change in quality element.	effect nd Element is insensitive to impact No	Removal of existing 20m culvert. Localised improvement in flow dynamics, but no change in q element.	Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and flow dynamics upstream and downstream. No measurable change i quality element.	Removal of existing 250m culvert. Localised improvement in flow dynamics, but no change in qual it element.	Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and flow dynamics upstream and downstream. No measurable change in quality element.	Watercourse is currently culverted below agricultural fields at this location. New culvert to comprise larger dimensions, design of culvert to minimise impact on flow and sediment continuity and to ensure appropriate low flow water depths are maintained. Localised improvement in flow dynamics, but no change in quality element.	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. New culvert to comprise larger dimensions, design of culvert to minimise impact on flow and sediment continuity and to ensure appropriate low flow water depths are maintained. Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and flow dynamics upstream and downstream. No measurable change in quality element.	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality eleme when balanced against mitigation embedded in the scheme.	t Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element.	y com Whe	Adverse effect anticipated when scheme imponent effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Connection to groundwater bodies	Eler	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agri- outside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for tempora in connection to groundwater bodies as a result of activities. Potential adverse effects on the conn groundwater bodies. There is a risk that a change in occur. Requires additional mitigation.	cultural land maximum ry reduction dewatering ection to status could	nct	Element is inser	Localised and te outside of war excavation deptinsensitive to impact in connection tractivities. Progroundwater books	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction to groundwater bodies as a result of dewatering Potential adverse effects on the connection to todies. There is a risk that a change in status could occur. Requires additional mitigation.	Element is insensitive to impact		Element is insensitive to impact	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in connection to groundw as a result of dewatering activities. Potential adverse effection connection to groundwater bodies. There is a risk that a chancould occur. Requires additional mitigation.	land within th: 15mbgl). water bodies ects on the nge in status	Localised but permanent loss of connection to surrounding shallow groundwater within superfi deposits. However no likely effect anticipated connection to groundwater bodies. No measural change in quality element.	cial n Element is insensitive to impact ble	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 20m culvert. Localised but permanent re-connection to surrounding shallon groundwater within superficial deposits. However likely effect anticipated on connection to groundwaters. No measurable change in quality elements	Element is insensitive to impact ater	Element is insensitive to impact	Removal of existing 250m culvert. Localised but permanent re-connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwate bodies. No measurable change in quality element	Element is insensitive to impact	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on groundwater connectivity. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficia deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	A com Whe in the con e	Adverse effect anticipated when scheme mponent effects considered in combination. Then balanced against mitigation embedded to the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation. Addition	onal mitigation measures for the	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
River continuity Supports good Supports good	od by 2015 N/A - Hydromorphology effects screened out for scheme component	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. No like effect anticipated on river continuity. No measurab change in quality element.	ural ct ly Element is insensitive to impact e	Element is insensitive to imp	N/A - Hydromorphology effects screened o	Localised and temporary excava outside of watercourse catch impact on channel or riparian z on river continuity. No measur ut for scheme	cavation of area of agricultural land atchment area. No direct physical an zone. No likely effect anticipated asurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	N/A - Hydromorphology effects screened out for sch	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effect anticipated on river continuity. No measurable change in quality element.	No Element is insensitive to impact y.	Element is insensitive to impact	Localised but permanent changes to hydromorphoregime. Localised adverse effects on river continuanticipated, but no change in quality element who balanced against mitigation embedded in the scheduler.	logy uity len me.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 20m culvert. Localised improvement in flow continuity, but no change quality element.	n Element is insensitive to impact	Element is insensitive to impact	Removal of existing 250m culvert. Localised improvement in flow continuity, but no change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. New culvert to comprise larger dimensions and design of culvert to minimise impact on flow and sediment continuity. Localised improvement in flow continuity, but no change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	Element is insensitive to impact	Element is insensitive to impact	None - water bodies upstream affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate downstream and	Localised improvement anticipated when scheme component effects considered in combination, but no change in quality element. management Bourne Brow during the component effects water environt designed in combination, but no change in quality element. management Bourne Brow during the component environt materials water environt designed in component effects considered in Levels and in Agency. Note that is a supplied to the component effects considered in Levels and in Leve	ent of groundwater baseflow to the ook and Crawley Brook watercourses onstruction phase will be required to there is no significant impact on the onment. Mitigation measures will be detail following ground investigation ing of surface water and groundwater n consultation with the Environment Mitigation could take the form of: of material from (and backfilling) the in phases to reduce the groundwater	N/a Compliant - no change in hydromorphological status of
Hydromorphic River depth and width variation	Creation of 5 hydromorpholo gain of rive anticipated or	of 55m of new channel, with incorporated ological improvements (resulting in 5m ne iver channel). However negligible effect on river depth and width. No measurable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measurable change in quality element.	Element is insensitive to impact	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. No like effect on river depth and width variation. No measure change in quality element.	Localised and temporary excavation of area of agri- ural outside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for tempora in flow regime as a result of dewatering activities adverse effects on the river depth and width variation. risk that a change in status could occur. Requires mitigation.	No direct physical impact on channe changes in processes and habitat up downstream. No likely effects anticipal depth and variation. No measurable changed additional	leading to tream and ted on river nge in quality	Localised and temporary excava outside of watercourse catch impact on channel or ripariar depth and width variation. No elem	Localised and te outside of ware action of area of agricultural land atchment area. No direct physical arian zone. No likely effect on river in flow regime adverse effects of the company	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction ne as a result of dewatering activities. Potential on the river depth and width variation. There is a mange in status could occur. Requires additional mitigation.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely ects anticipated on river depth and variation. No measural change in quality element	in ely rable	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel. No likely effect on river depth and width variation. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential adverse effects on the rive width variation. There is a risk that a change in status course requires additional mitigation.	land within th: 15mbgl). m as a result er depth and uld occur. No direct physical impact on river channel or zone leading to changes in river processes u and downstream. No likely effects anticipated depth and variation. No measurable change is element	Localised but permanent changes to hydromorphorestream don river width anticipated, but no change in quality elements when balanced against mitigation embedded in scheme.	logy and ent Element is insensitive to impact the	Localised but permanent changes to hydromorphol regime. However negligible effect anticipated on riprocesses and river depth and variation upstream downstream. No measurable change in quality elem	Creation of 150m of new realigned channel, vincorporated hydromorphological improvem (resulting in 30m net gain of open river channent. However negligible effect anticipated on river and width. No measurable change in quality ele	ith Localised but permanent change to nts hydromorphological regime. However negligible of el). anticipated on river processes and river depth of the septh width upstream and downstream. No measural change in quality element.	effect and Element is insensitive to impact able	Removal of existing 20m culvert. Localised improvement in river width and depth, but no char quality element.	ge in Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and river width and depth upstream and downstream. No measurable change in quality element.	Removal of existing 250m culvert. Localised improvement in river width and depth, but no change i quality element.	n Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and river width and depth upstream and downstream. No measurable change in quality element.	Watercourse is currently culverted below agricultural fields at this location. New culvert to comprise larger dimensions and design of culvert to minimise impact on flow and sediment continuity. Localised improvement in river depth and width, but no change in quality element.	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. New culvert to comprise larger dimensions and design of culvert to minimise impact on flow and sediment continuity. Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and river depth upstream and downstream. No measurable change in quality element.	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality element.	significantly affecting flow regime or sediment transfer) A com Who in the color of the color o	 Adverse effect anticipated when scheme imponent effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation. a augmentat water abstra instal adoption of the quality element. Requires additional mitigation. 	zone of influence; tion of flow in the watercourse using acted from the borrow pit excavation; uffer strip, or shallower batter on the excavations; llation of a groundwater cut off; wet working techniques that avoid the eed for dewatering; and/or f a new lined channel and temporary diversion.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
Structure and substrate of the river bed	Creation of 5 hydromorpholo gain of rive anticipated on measu	of 55m of new channel, with incorporated ological improvements (resulting in 5m ne iver channel). However negligible effect on structure and substrate of river bed. No asurable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes structure and substrate of river bed upstream and downstream. No measurable change in quality element.	Element is insensitive to impact	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No dire physical impact on channel or riparian zone. No like effects anticipated on structure and substrate of river No measurable change in quality element.	Localised and temporary excavation of area of agrioutside of watercourse catchment area (assumed excavation depth of 18mbgl). Potential for tempora in flow regime as a result of dewatering activities negligible effect anticipated on substrate. No measurin quality element.	No direct physical impact on channe changes in processes and habitat up downstream. No likely effects anticipate and substrate of river bed. No measura quality element.	leading to tream and d on structure ple change in	Localised and temporary excava outside of watercourse catch impact on channel or riparian zo on structure and substrate of ri in quality	Localised and te outside of war atchment area. No direct physical excavation dept in flow regime of river bed. No measurable change ality element.	temporary excavation of area of agricultural land atercourse catchment area (assumed maximum oth of 18mbgl). Potential for temporary reduction ne as a result of dewatering activities. However t anticipated on substrate. No measurable change in quality element.	No direct physical impact on channel leading to changes in processes and habitat upstream and downstream. No likely fects anticipated on structure and substrate of river bed. No measurable change in quality element.	in ely No	Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on river channel. No likely effects anticipated on structure and substrate of rive bed. No measurable change in quality element.	Localised and temporary excavation of area of agricultural vicinity of watercourse (assumed maximum excavation dept Potential for temporary reduction in flow regime downstrear of dewatering activities. Potential localised but temporary effects on river substrate (due to a potential increase in silta change in quality element when balanced against mitigation in the scheme.	land within th: 15mbgl). mas a result zone leading to changes in river processes u and downstream. No likely effects anticipa structure and substrate of river bed. No mean tembedded change in quality element.	Localised but permanent changes to hydromorphorestream regime. Localised adverse effects on structure of a bed anticipated, but no change in quality elements when balanced against mitigation embedded in scheme.	logy iver nt Element is insensitive to impact the	Localised but permanent changes to hydromorphol regime. However negligible effect anticipated on ripprocesses and structure and substrate of river be upstream and downstream. No measurable change quality element.	Creation of 150m of new realigned channel, with incorporated hydromorphological improvem (resulting in 30m net gain of open river change in substrate of river bed. No measurable change in element.	Localised but permanent change to hydromorphological regime. However negligible anticipated on river processes structure and subsoft river bed upstream and downstream. No measurchange in quality element.	effect estrate Element is insensitive to impact urable	Removal of existing 20m culvert. Localised improvement in structure and substrate of river l but no change in quality element.	ed, Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river downstream. No measurable change in quality element.	Removal of existing 250m culvert. Localised improvement in structure and substrate of river bed, but no change in quality element.	Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river downstream. No measurable change in quality element.	Watercourse is currently culverted below agricultural fields at this location. Invert of new culvert to be buried below river bed to allow for build up of natural substrate. Localised improvement in substrate, but no change in quality element.	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. Invert of new culvert to be buried below river bed to allow for build up of natural substrate. Localised but permanent improvement to hydromorphology regime. However negligible effect anticipated on river processes and substrate upstream and downstream. No measurable change in quality element.	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on structure of rive bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measurable change in quality element.	y Lo so con whe	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Structure of the riparian zone	Creation of 5 riparian/marg 5m net gain of in structure of	of 55m of new channel, with incorporated arginal habitat improvements (resulting in of river channel). Localised improvement e of riparian zone, but no change in quality element.	Element is insensitive to impact	Creation of 55m of new channel, with incorporate riparian/marginal habitat improvements (resulting 5m net gain of river channel). Localised improvem in structure of riparian zone, but no change in quaelement.	Localised and temporary excavation of area of agricul land outside of watercourse catchment area. No directly physical impact on channel or riparian zone. No like effects anticipated on structure of riparian zone. No measurable change in quality element.	ural ct ly Element is insensitive to impact o	Element is insensitive to imp	oct	Localised and temporary excava outside of watercourse catch impact on channel or riparian zone. No elem	cavation of area of agricultural land atchment area. No direct physical an zone. No likely effects anticipated ne. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact		Localised and temporary excavation of area of agricultural land within vicinity of watercourse (approx. 0.02% of catchment area of watercourse). No direct physical impact on riparian zone. No likely effects anticipated on structure of riparian zone. No measurable change in quality element.	No Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of riparian zone Localised adverse effects on structure of riparian anticipated, but no change in quality element will balanced against mitigation embedded in the sche	Element is insensitive to impact me.	Element is insensitive to impact	Creation of 150m of new realigned channel, vincorporated riparian improvements (resulting net gain of open river channel). Localised improin structure of riparian zone, but no change in celement.	ith n 30m ement Element is insensitive to impact uality	Creation of 150m of new realigned channel, wit incorporated riparian improvements (resulting in net gain of open river channel). Localised improvement, but no change in quality element	Removal of existing 20m culvert. Localised improvement in structure of riparian zone, but change in quality element.	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in riparian zone, but no change in quality element.	t Element is insensitive to impact	Removal of existing 250m culvert. Localised improvement in structure of riparian zone, but no change in quality element.	Removal of existing 250m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in riparian zone, but no change in quality element.	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on structure of riparian zone. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zon anticipated, but no change in quality element wher balanced against mitigation embedded in the schem	Element is insensitive to impact	Element is insensitive to impact	Lc	Localised improvement anticipated when scheme component effects considered in combination, but no change in quality element.		N/a

Source to Chatcull Brook Watercourse (EIA receptor value):	Source to Chatcull Brook (GB10										Леесе Brook 2 (Moderate)			Detailed Impact Assessment								named tributary of Meece Brook 3 (Mode	arata)			trook (High)			Detailed Impa	ct Assessment Results	
Scheme component:		WFD-MEE-T-02-0 Realignment (with removal of exist	01 ting highway culvert)		Highway Realignment Culvert (on rea	WFD-MEE-T-02-02 aligned channel) (replacement of existing h	nighway culvert; see WFD-MEE-T-02-01)		WFD-MEE-T-02-03 Access road culvert (on realigned channel)			WFD-MEE-T-02-04 Access road culvert (on realigned chann	el)	WFD-MEE-T-02-05 Underbridge		WFD-MEE-T-02-06 Access road culvert (on realigned channe)		WFD-MEE-T-02-07 Realignment		Oill	WFD-AP2-02 Access road culvert	erate)	WFD-MEE-W-01-01 Viaduct	ivieece b	WFD-MEE-W-01-02 Realignment			Addit	onal mitigation requirements	
Description of scheme component:	Approx. total lengt	th of new realigned channel: 100m; Approx. total length of existing ch	nannel: 95m (85m open channel; 10m culverted); Total net	t gain: 5m		Approx. culvert length: 10m; Approx. culvert dimensions: 0.	.9m		Approx. culvert length: 10m; Approx. culvert dimensions: 0.9m	n		Approx. culvert length: 10m; Approx. culvert dimensions:).9m	Swynnerton Footpath 10 Underbridge; Approx. total lengt of underbridge: 70m: Approx. total width of underbridge 15m	th :	Approx. culvert length: 10m; Approx. culvert dimensions: 0.	lm	Approx. total length of new re	ealigned channel: 45m; Approx. total length of existing chanr	l: 30m; Total net gain: 15m	А	Approx. culvert length: 21m; Approx. culvert dimensions: 1.	.4m	Meece Brook Viaduct; Approx. viaduct width: 15m; Approx. viaduct length: 240m; Approx. viaduct height: 12m	Approx. total length of nev	w realigned channel: 65m; Approx. total length of existing ch	nannel: 55m; Total net gain: 10m	Cumulative effects - effects on			WFD co
The le Summary of embedded mitigation: the exist	e length of watercourse realignments has been reduced as existing channel footprint. Where natural watercourse, the land drainage functions	far as reasonably practicable. Design of the new channel will also en design will aim to enhance hydromorphological condition over the exi 1. In addition, the design of the new channel will allow for a 10m wide	nsure the equivalent hydraulic capacity and incorporation c isting condition where reasonably practicable (provided th e buffer zone for the implementation of marginal/riparian i	of appropriate features equivalent to those lost along his is compatible with the watercourses' flood risk and improvements.	Culvert length has been reduced as far as reasonably praction maintain natural substrate. Culvert sized to minimise impaction and to ensure appropriate low flow water depths and velocity.	cticable. Invert of culvert to be buried 300mm below the exict on flow continuity. Detailed design to be developed in gerocities for fish passage. Hydromorphological improvements downstream of the culvert to compensate for footprint los	isting bed level to reduce disruption to sediment transfer and neral accordance with CIRIA and Environment Agency guidan to be undertaken to river channel immediately upstream and ss.	Culvert length has been reduced as far as reasonably promaintain natural substrate. Culvert sized to minimise impaand to ensure appropriate low flow water depths and vel	acticable. Invert of culvert to be buried 300mm below the existict on flow continuity. Detailed design to be developed in gener ocities for fish passage. Hydromorphological improvements to downstream of the culvert to compensate for footprint loss.	ing bed level to reduce disruption to sediment transfer and ral accordance with CIRIA and Environment Agency guidance be undertaken to river channel immediately upstream and	Culvert length has been reduced as far as reasonably pr maintain natural substrate. Culvert sized to minimise impa and to ensure appropriate low flow water depths and ve	racticable. Invert of culvert to be buried 300mm below the e act on flow continuity. Detailed design to be developed in g elocities for fish passage. Hydromorphological improvemen downstream of the culvert to compensate for footprint I	xisting bed level to reduce disruption to sediment transfer an eneral accordance with CIRIA and Environment Agency guidar s to be undertaken to river channel immediately upstream and oss.	Clear span bridge. Underbridge length has been reduced far as reasonably practicable.	Culvert length has been reduced as far as reasonably prac maintain natural substrate. Culvert sized to minimise impact and to ensure appropriate low flow water depths and veloc	cticable. Invert of culvert to be buried 300mm below the exit on flow continuity. Detailed design to be developed in ger cities for fish passage. Hydromorphological improvements downstream of the culvert to compensate for footprint los	eting bed level to reduce disruption to sediment transfer and eral accordance with CIRIA and Environment Agency guidance o be undertaken to river channel immediately upstream and s.	The length of watercourse realignments has been reduce incorporation of appropriate features equivalent to those lo condition over the existing condition where reasonably praction of the new channel will allow	ed as far as reasonably practicable. Design of the new channost along the existing channel footprint. Where natural water cicable (provided this is compatible with the watercourses' flow w for a 10m wide buffer zone for the implementation of marg	I will also ensure the equivalent hydraulic capacity and burse, the design will aim to enhance hydromorphological d risk and land drainage functions). In addition, the design hal/riparian improvements.	Culvert length has been reduced as far as reasonably pract maintain natural substrate. Culvert sized to minimise impact and to ensure appropriate low flow water depths and veloc	cticable. Invert of culvert to be buried 300mm below the exit on flow continuity. Detailed design to be developed in generaties for fish passage. Hydromorphological improvements downstream of the culvert to compensate for footprint los	risting bed level to reduce disruption to sediment transfer and eneral accordance with CIRIA and Environment Agency guidance to be undertaken to river channel immediately upstream and sss.	Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce shading impact.	The length of watercourse realignments has been reduincorporation of appropriate features equivalent to those condition over the existing condition where reasonably proof the new channel will a	uced as far as reasonably practicable. Design of the new che lost along the existing channel footprint. Where natural was acticable (provided this is compatible with the watercourses llow for a 10m wide buffer zone for the implementation of m	nannel will also ensure the equivalent hydraulic capacity and atercourse, the design will aim to enhance hydromorphological s' flood risk and land drainage functions). In addition, the design marginal/riparian improvements.	element from scheme component(s) located in other WFD water bodies	Overall effect on element	ruction Operation	Residual effects on element outcome - p
2015 Status Status Objective	Footprint	Change changes	es to water body hydromorphology leading to sin river processes and habitats upstream and downstream	Creation of new habitats	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream an downstream	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint	Shading	Changes to water body hydromorphology leading t changes in river processes and habitats upstream ar downstream	o d Shading	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Creation of new habitats	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Shading	Footprint	Changes to water body hydromorphology leading to changes in river processes and habitats upstream an downstream	o d Creation of new habitats				
Moderate Good by 2027 Concording the phytok	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal abitat improvements (resulting in 5m net gain of river hannel). Localised improvement in macrophytes and tobenthos habitat, but no change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macrophyte and phytobenthos habitat anticipated, but no change in quality element.	ed but permanent change to hydromorphological e. However negligible effect anticipated on river sses and macrophytes and phytobenthos habitat am and downstream. No measurable change in quality element.	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal bitat improvements (resulting in 5m net gain of river nannel). Localised improvement in macrophytes and tobenthos habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river chann Localised adverse effect on macrophytes and phytobenthe anticipated (due to a reduction in photosynthetic activity but no change in quality element when balanced again mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobentho anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobentho anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river char Localised adverse effect on macrophytes and phytoben anticipated (due to a reduction in photosynthetic activi but no change in quality element when balanced aga mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on rive processes and macrophytes and phytobenthos habita upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent shading of a section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality eleme when balanced against mitigation embedded in the scheme.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel Localised adverse effect on macrophytes and phytobenthe anticipated (due to a reduction in photosynthetic activity) but no change in quality element when balanced again mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	Localised but permanent loss of open river habitat. ocalised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river chann Localised adverse effect on macrophytes and phytobenthe anticipated (due to a reduction in photosynthetic activity but no change in quality element when balanced again mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measurable change in quality element.	Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measurable change in quality element	I. Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream. No measurable change in quality element.	Localised but permanent change to hydromorphologica regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream. No measurable change in quality element.	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream. No measurable change in quality element.		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Moderate Good by 2027 habit	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal abitat improvements (resulting in 5m net gain of river nannel). Localised improvement in macroinvertebrate habitat, but no change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in macroinvertebrate habitat anticipated (including due to a increase in riparian and aquatic vegetation), but no change in quality element.	ed but permanent change to hydromorphological income. However negligible effect anticipated on river ses and macroinvertebrate habitat upstream and chambeam. No measurable change in quality element.	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal bitat improvements (resulting in 5m net gain of river annel). Localised improvement in macroinvertebrate habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river chann Localised adverse effects on macroinvertebrates anticipat (including due to a reduction in/loss of riparian and aquat vegetation), but no change in quality element when balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in qualice.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrates anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river char Localised adverse effects on macroinvertebrates anticip (including due to a reduction in/loss of riparian and aquivegetation), but no change in quality element whe balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorpholog regime. However negligible effect anticipated on rive processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quale.	Localised but permanent shading of a section of river channel. Localised adverse effects on macroinvertebrate anticipated (including due to a potential reduction in riparian and aquatic vegetation), but no change in quali element when balanced against mitigation embedded the scheme.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel Localised adverse effects on macroinvertebrates anticipate (including due to a reduction in/loss of riparian and aquat vegetation), but no change in quality element when balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in macroinvertebrate habitat, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in macroinvertebrate habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river chann Localised adverse effects on macroinvertebrates anticipat (including due to a reduction in/loss of riparian and aquat vegetation), but no change in quality element when balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measurable change in quality element.	Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measurable change in quality element	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element	Localised but permanent change to hydromorphologica regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element.	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measurable change in quality element.	None	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	required None required	N/a Compliant - biological statu
Good by 2027 habit	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal ribitat improvements (resulting in 5m net gain of river annel). Localised improvement in fish habitat, but no change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised regime provement in fish habitat anticipated (including due to a acrease in riparian and aquatic vegetation), but no change in quality element.	ed but permanent change to hydromorphological income. However negligible effect anticipated on river less and fish habitat upstream and downstream. No measurable change in quality element.	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal bitat improvements (resulting in 5m net gain of river annel). Localised improvement in fish habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquat vegetation), but no change in quality element when balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measurable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section channel. Localised adverse effects on fish anticipate (including due to a reduction in/loss of riparian and aqu vegetation), but no change in quality element whe balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on rive processes and fish habitat upstream and downstream culvert. No measurable change in quality element.	Localised but permanent shading of a section of river channel. Localised adverse effects on fish anticipated (including due to a potential reduction in riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquat vegetation), but no change in quality element when balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in fish habitat, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in fish habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquat vegetation), but no change in quality element when balanced against mitigation embedded in the scheme	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measurable change in quality element.	Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measurable change in quality element	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element.	Localised but permanent change to hydromorphologica regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element.	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measurable change in quality element.		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Good by 2015 Good by 2015	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal abitat improvements (resulting in 5m net gain of river channel). However negligible effect anticipated on olived oxygen concentrations. No measurable change in quality element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in dissolved oxygen concentrations (due to increased photosynthetic activity by aquatic flora), but no change in quality element.	ed but permanent change to hydromorphological e. However negligible effect anticipated on river es and dissolved oxygen concentrations upstream ownstream. No measurable change in quality element.	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal bitat improvements (resulting in 5m net gain of river channel). However negligible effect anticipated on lived oxygen concentrations. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact of dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent shading of culverted section channel. Potential to lead to minor and localised impact dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverseffects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on rive processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality elements	Localised but permanent shading of a section of river channel. Potential to lead to minor and localised impact of dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Se Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact of dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measurable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstream and downstream. No measurable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact of dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measurable change in quality element.	Some minor, localised and periodic shading of river channel (with potential associated reduction in photosynthetic activity by aquatic flora). However, negligible effect on dissolved oxygen concentrations anticipated. No measurable change in quality element.	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measurable change in quality element.	Localised but permanent change to hydromorphologica regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstrea and downstream. No measurable change in quality element.	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measurable change in quality element.		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
High Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact. No measurable change to quality element		N/a
Poor Good by 2027	Element is insensitive to impact	Element is insensitive to impact	inco hab Element is insensitive to impact char inp antic	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal bitat improvements (resulting in 5m net gain of river annel). Potential localised reductions in fine sediment puts and nutrient loading. However negligible effect cipated on phosphate concentrations. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal nabitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measurable change in quality element.	None	Negligible effect anticipated in when effects considered in combination. No measurable change in quality element	required None required	N/a Compliant - physicochemica bo
High Good by 2015	Element is insensitive to impact	Element is insensitive to impact	inco hab Element is insensitive to impact char inp antio	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal bitat improvements (resulting in 5m net gain of river annel). Potential localised reductions in fine sediment puts and nutrient loading. However negligible effect icipated on ammonia concentrations. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal nabitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 65m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia concentrations. No measurable change in quality element.		Negligible effect anticipated in when effects considered in combination. No measurable change in quality element		N/a
Good by 2015	Element is insensitive to impact le	Removal of existing 10m culvert. Localised but permanent eduction in shading of section of river channel. Potential to ead to localised improvement in water temperature, but no change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact of water temperature. Localised adverse effects anticipated but no change in quality element when balanced again mitigation embedded in the scheme.	n <mark>st</mark>	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact		but no change in quality element when balanced aga	<mark>nst </mark>	but no change in quality element when balanced again	Element is insensitive to impact	but no change in quality element when balanced again	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact of water temperature. Localised adverse effects anticipated but no change in quality element when balanced again mitigation embedded in the scheme.	on d, Element is insensitive to impact	Some minor, localised and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measurable change in quality element.	l. Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
- Not assessed		N/A - Specific pollutants effects screened out for	r scheme design component		N/A - S	Specific pollutants effects screened out for scheme design c	component	N/A -	Specific pollutants effects screened out for scheme design com	nponent	N/A -	- Specific pollutants effects screened out for scheme design	component		N/A - Sp	pecific pollutants effects screened out for scheme design c	omponent	N/A - Sp	pecific pollutants effects screened out for scheme design com	onent	N/A - Sp	pecific pollutants effects screened out for scheme design c	component	N/A - Specific pollutants effects screened out for scheme design component	N/A -	Specific pollutants effects screened out for scheme design	component				
C incorpo 5m n	Creation of 100m of new realigned channel, with rporated hydromorphological improvements (resulting in net gain of river channel). Localised improvement in flow dynamics, but no change in quality element.	Element is insensitive to impact processes downstre	ed but permanent change to hydromorphological e. However negligible effect anticipated on river s and quantity and dynamics of flow upstream and eam. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream a downstream. No measurable change in quality elemen	Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element	Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on rive processes and quantity and dynamics of flow upstream downstream. No measurable change in quality elements	and nt	Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element	Creation of 45m of new realigned channel, with incorporated hydromorphological improvements (resulting in 15m net gain of river channel). Localised improvement in flow dynamics, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measurable change in quality element	d	10m net gain of river channel). However negligible effect anticipated on river processes and quantity and dynamics	in Localised but permanent change to hydromorphologica regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream a downstream. No measurable change in quality elemen	and		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	g er Element is insensitive to impact r	Element is insensitive to impact		Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measurable change in quality element.	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		No effect anticipated in when effects considered in combination. No measurable change in quality element		N/a
incor	Creation of 100m of new realigned channel, with corporated hydromorphological and riparian/marginal abitat improvements (resulting in 5m net gain of river channel). Including removal of existing 10m culvert. lised improvement in river continuity, but no change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a Compliant -
Support Good Supports Good by 2015 C incorpo 5m n anti	Creation of 100m of new realigned channel, with reporated hydromorphological improvements (resulting in net gain of river channel). However negligible effect nticipated on river depth and width. No measurable change in quality element.	Localise regime Element is insensitive to impact procedum	ed but permanent change to hydromorphological e. However negligible effect anticipated on river esses and river depth and width upstream and eam. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality elemen	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality element	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and widtl anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on rive processes and river depth and variation upstream and downstream. No measurable change in quality elements	N/A - Hydromorphology effects screened out for scheme design component	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality element	Creation of 45m of new realigned channel, with incorporated hydromorphological improvements (resulting in 15m net gain of river channel). However negligible effect anticipated on river depth and width. No measurable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measurable change in quality element	N/A - Hydromorphology effects screened out for scheme design component	Creation of 65m of new realigned channel, with incorporated hydromorphological improvements (resulting 10m net gain of river channel). However negligible effect anticipated on river depth and width. No measurable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measurable change in quality elements	el r Element is insensitive to impact nt.	None	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	required None required	hydromorpho wate
C incorpo 5m n antic	Creation of 100m of new realigned channel, with reporated hydromorphological improvements (resulting in net gain of river channel). However negligible effect nticipated on structure and substrate of river bed. No measurable change in quality element.	Localise regime Element is insensitive to impact processes downstre	ed but permanent change to hydromorphological e. However negligible effect anticipated on river s structure and substrate of river bed upstream and eam. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstre and downstream. No measurable change in quality element.	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measurable change in quality element	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	d Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on rive processes and structure and substrate of river bed upstrand downstream. No measurable change in quality element	eam	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measurable change in quality element	Creation of 45m of new realigned channel, with incorporated hydromorphological improvements (resulting in 15m net gain of river channel). However negligible effect anticipated on structure and substrate of river bed. No measurable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes structure and substrate of river bed upstream and downstream. No measurable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstrean and downstream. No measurable change in quality element	n	Creation of 65m of new realigned channel, with incorporated hydromorphological improvements (resulting 10m net gain of river channel). However negligible effect anticipated on structure and substrate of river bed. No measurable change in quality element.	in regime. However negligible effect anticipated on river processes structure and substrate of river bed upstream a downstream. No measurable change in quality elemen	al r Element is insensitive to impact and nt.		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Cincor	corporated riparian improvements (resulting in 5m net r	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in riparian zone, but no change in quality	Element is insensitive to impact gai	Creation of 100m of new realigned channel, with orporated riparian improvements (resulting in 5m net ain of river channel). Localised improvement, but no change in quality element.	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced agains mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the schome.	Element is insensitive to impact	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated riparian improvements (resulting in 15m net gain of river channel). Localised improvement, but no change in quality element.	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated riparian improvements (resulting in 15m net gain of river channel). Localised improvement, but no change in quality element.	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Creation of 65m of new realigned channel, with incorporated riparian improvements (resulting in 10m negain of river channel). However negligible effect anticipate on river processes and quantity and structure of riparian	t ed Element is insensitive to impact	Creation of 65m of new realigned channel, with incorporated riparian improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and quantity and structure of riparian		Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation		N/a

High Speed Two (HS2) Limited Two Snowhill Snow Hill Queensway Birmingham B4 6GA

08081 434 434 HS2Enquiries@hs2.org.uk www.hs2.org.uk