

Appendix C Revised WFD Compliance Assessment



River Sowy and King's Sedgemoor Drain Enhancements Scheme: Phase 1 Full Water Framework Directive Assessment

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Quality Assurance

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Note

This document has been updated to reflect changes in the proposed design and construction methodology of the Scheme following consultation on version 1 of the WFD Assessment in Summer 2020.

Changes in the scheme design and construction methodology, and in the assessment, are highlighted in yellow in the following sections. Text that is no longer relevant has been struck through.

This document should be read in conjunction with the following documents which are referenced herein:

- River Sowy and KSD Enhancements Scheme: Phase 1 Environmental Statement (available at the following weblink: <https://consult.environment-agency.gov.uk/wessex/river-sowy-and-ksd-enhancements/>)
- River Sowy and KSD Enhancements Scheme: Phase 1 Environmental Statement Addendum

It should be noted that between Summer 2020 and May 2021 the Water Framework Directive ceased to have any regulatory standing in the UK, being replaced by the Water Environment Regulations. This assessment was originally undertaken before the UK left the European Union and therefore still refers to the Directive.

1. Introduction

This assessment report has been prepared for the River Sowy and King's Sedgemoor Drain Enhancements Scheme: Phase 1 (the Scheme).

A preliminary compliance assessment in respect of the Water Framework Directive (WFD) was undertaken for this Scheme in October 2019. It concluded that the compliance assessment had demonstrated that there are no identified adverse impacts to the water quality elements measured under the WFD assessment for the water bodies associated with the River Cary. However, for those associated with the King's Sedgemoor Drain (KSD), the assessment demonstrated potentially adverse impacts due to the nature of the works and the length of the works. Environment Agency guidance (Operating Instruction 488-10) for screening thresholds under the traffic light system states that:

- Channel widening, deepening, straightening or realigning is a high-risk activity to WFD objectives whatever the length or extent
- Embankment works are high risk where the length of channel affected is greater than 100m; lower risk for between 10 and 100m; and low risk for less than or equal to 10m
- Reprofiling works are high risk where the length of channel affected is greater than 100m; lower risk for between 10 and 100m; and low risk for less than or equal to 10m

It was concluded that the Scheme options could cause deterioration in the status of the water bodies and may cause failure to meet surface water Good Ecological Status (GES) or Potential (GEP) or result in a deterioration of surface water Ecological Status or Potential. This assessment has been undertaken to better understand these risks and to identify if these can be mitigated to ensure compliance with the environmental objectives of the Directive.

1.1. Purpose of Report

The WFD needs to be taken into account in the planning of all new activities in the water environment. The Environment Agency (EA), as competent authority in England and Wales are responsible for delivering the Directive through the Environment (Water Framework Directive) (England and Wales) Regulations 2017¹.

The generic environmental objectives set out below (based on Article 4.1 of the Directive and as described in Table 1) are used for the assessment of the Scheme in relation to the Directive:

- No changes affecting high status sites
- No changes that will cause failure to meet surface water good ecological status or potential or result in a deterioration of surface water ecological status or potential

¹ 2017 SI No. 407 WATER RESOURCES, ENGLAND AND WALES. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

- No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies
- No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status

Table 1 Environmental Objectives of the Water Framework Directive

Objectives
Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water.
Member States shall protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status by 2015.
Member States shall protect and enhance all artificial and heavily modified bodies of water, with the aim of achieving good ecological potential and good surface water chemical status by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status by 2021 or 2027.
Progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances.
Prevent Deterioration in Status and prevent or limit input of pollutants to groundwater.

Member states must meet the conditions of the WFD unless they meet the criteria laid out in Article 4.7. To be compliant, the following condition must be met: "the beneficial objectives served by the modifications or alterations of the water body cannot, for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option."

Additionally, the Somerset Levels Special Protection Area (SPA) needs to be considered in terms of integrity to the site as a result of the Scheme, in order to comply with Article 4.9.

2. Outline of scheme

2.1. River Sowy and King's Sedgemoor Drain Enhanced Capacity Scheme: Phase 1 (the Scheme) Overview

2.1.1. Overview

The Scheme focusses on capacity enhancements between Monk's Leaze Clyce on the Sowy and Parchey Bridge on the KSD as shown on Figure 1.1 of the Environmental Statement (ES) Addendum (see Appendix A of the ES Addendum) and set out in Table 2 below.

Table 2 Capacity enhancements

Location	Bank raising		Channel widening
Upper Sowy	Sowy between Monk's Leaze Clyce and A372 Beer Wall	Raising of existing informal flood banks on right bank by up to 0.5m to achieve capacity of 17m ³ /s	None
Lower Sowy	Sowy between A372 Beer Wall and A361	Raising of existing informal flood banks on left and right bank by up to 0.3m to achieve a capacity of 24m ³ /s.	On the right bank: <ul style="list-style-type: none">• One embayment• One section of two-stage channel
	Sowy between A361 and Sowy/KSD confluence	Raising of existing informal flood banks on left bank by up to 0.3m to achieve a capacity of 24m ³ /s. No bank raising on the right bank.	On the right bank: <ul style="list-style-type: none">• One embayment• One section of two-stage channel
KSD	KSD between Sowy/KSD confluence and Parchey Bridge	Raising of existing informal flood banks on left and right bank by up to 0.5m to achieve a capacity of up to 27m ³ /s	On the right bank: <ul style="list-style-type: none">• One embayment• One backwater• One section of two-stage channel

2.1.2. Raising and re-profiling of existing informal flood embankments

Where existing informal flood embankments are to be reprofiled or raised, the crest width will be maintained at a minimum of 3m or increased to 3m, with formed battered

embankment sides of 1 in 3 slopes on the channel side and 1 in 5 slopes on the landward side.

Material required for raising of the existing informal flood embankments on the KSD would be won through reprofiling of the existing informal flood embankments on the right bank and left banks **and generated from the creation of channel bank features along the right bank**, should the excavated material be suitable (see section 2.1.3).

Material required for raising of the existing informal flood embankments on the Sowy would be:

- **won through reprofiling of the existing informal flood embankments on the right bank and left bank**
- imported under CL:AIRE Code of Practice (COP) from a soils processing plant located off the A372 near Westonzoyland; **and**
- **generated from the creation of channel bank features along the right bank, should the excavated material be suitable. If material won through creation of channel widening structures is not suitable for use in bank raising, it would be placed on the landward side of the existing informal flood embankments.**

2.1.3. Channel widening: embayments, two-stage channel and back waters (WFD enhancement features)

The Scheme includes creation of channel bank features on the right bank of the KSD and Lower Sowy at the locations indicated on **Figure 1.1 of the ES Addendum (see Appendix A of the ES Addendum)** which both provide a small degree of additional channel capacity within the Sowy and KSD corridor and help to increase the diversity of aquatic and riparian habitats available within these man-made artificial waterbodies.

- Two-stage channels: up to 150m in length, with channel widening of 2m and a 5m marginal shelf with shelf level of 300mm below summer pen
- Embayments: 135-150m in length depending on location and 6m in width, with shelf level of 300m below summer pen
- Backwater: back channel 9m wide and 100m in length, with a “planted island” of 6m width, with access to island via a bridge provided for maintenance purposes

Proposed locations for the WFD enhancement feature locations, along with a typical plan view layouts and cross sections for each type of enhancement (e.g. embayment, two-stage channel and backwater), are shown in **Figure 1.1 of the ES Addendum (see Appendix A of the ES Addendum)**. Their placement and dimension have been designed to improve channel form and diversity, maximise benefit to water vole through providing good quality habitat within areas currently identified as sub-optimal and minimise loss of trees.

2.2. Outfall improvements

The Cossington Right and Chilton Right outfalls both include concrete headwalls and steel sheet-piled wing walls. Crest levels of both structures are below the required design level and will be modified to provide a continuous defence level when combined with the bank raising works.

2.3. Operation

Current reactive maintenance undertaken on the section of the KSD included within the Proposed Scheme may include removal of fallen branches or occasional desilting. Desilting works were undertaken at Parchey Bridge during 2018.

The principal current maintenance activity along the Sowy is routine weed cutting and clearing, carried out at least once, and sometimes twice, per year depending on need. In theory, this work is undertaken from alternate banks in order to share the burden of deposited cut weed on the adjacent farmland. However, the majority of the work is undertaken from the right bank as there are fewer access (and therefore safety) constraints. A new maintenance regime will be developed in conjunction with our internal specialist teams; however, the onus will remain on newly created WFD enhancement feature habitats developing naturally following completion of the initial construction aftercare period.

The ‘enhanced operation’ proposals outlined in section 3.1 of the ES for the Proposed Scheme which is available at the following weblink: <https://consult.environment-agency.gov.uk/wessex/river-sowy-and-ksd-enhancements/> would not be implemented following completion of the Proposed Scheme, however the measures identified under Mitigation Action Plan (MAP) developed by the EA, IDB and Natural England to counteract potential adverse effects on the Somerset Levels and Moors Special Protection Area (SPA) would be implemented as required. Further detail is provided in section 3.2 of the ES for the Proposed Scheme⁴.

2.3.1. Material Management

A Materials Management Plan (MMP) would be prepared by the contractor and agreed with the relevant authorities in advance of the start of construction to ensure that any excess imported material, or material won on site and found to be unsuitable for use in bank raising, is appropriately managed (e.g. by using to landscape the landward side of existing embankments) or disposed of, so excess materials will not present any risk of washing into the water body after any future flood events

2.3.2. Reprofiling of existing informal flood embankments

Light weight bulldozers would be used to reprofile the existing informal flood embankments. Topsoil will be stripped as and when required for construction (rather than in advance) to minimise the duration of weather exposure and associated risk of runoff into the water body.

2.3.3. Outfall improvements

The existing steel sheet piled wing walls at Cossington Right Rhyne and Chilton Right Rhyne will be replaced with new steel sheet piled walls which will extend further into the adjacent informal flood embankments that to tie in with existing areas of high ground. The existing steel will be removed from site. The crest level of the headwall will be raised with the addition of new coping. The new steel sheet piles will be driven to the design level, using a vibro-driven method to reduce noise during installation. WFD enhancement features

Long reach excavators would be used for the creation of the WFD enhancement features, which is programmed towards the end of the earthworks phase in order to

minimise the risk of adverse impacts of water quality (dissolved oxygen). In addition, a Surface Water Management Plan (SWMP) would be developed and agreed with the relevant authorities in advance of the start of construction. This would include measures such as the use of silt curtains, provision for dissolved oxygen monitoring where necessary, and other measures to protect water quality during earthworks. WFD enhancement features would be planted immediately following creation, with riparian tree planting taking place in November 2021 pending agreement with Natural England.

2.3.4. Site reinstatement

All land within the construction footprint would be fully reinstated with reseeding taking place as soon as construction works are complete within a given area. Livestock would be excluded as needed, at least until Spring 2023, to allow vegetation to establish.

3. Methodology

The existing preliminary WFD assessment (Jacobs, 2019 – see Appendix E1) concluded that a detailed assessment was needed for the extensive channel modification works on the ‘King’s Sedgemoor Drain – Henley Sluice to mouth’ water body (hereafter referred to as the ‘KSD water body’), and these are therefore screened in to this detailed assessment, whilst all the other elements of the Scheme have been screened out.

The following chapter provides a baseline assessment for the KSD water body and those immediately upstream and downstream (section 4.1), and a scoping of the water body quality elements potentially affected by the works (section 4.2). Inclusion of the up and downstream waterbodies was included in the preliminary assessment, and it was concluded that they should be scoped out of any further assessment, and so are not included here. This is followed by the impact assessment (section 4.3), which considers the potential impacts of an activity, identifies ways to avoid or minimise impacts, and indicates if an activity may cause deterioration or jeopardise the water body achieving good ecological potential (GEP). This is followed by assessment of the Scheme against mitigation measures (section 5); and a cumulative assessment against other proposed schemes (section 6).

4. Assessment

4.1. Baseline data collection

The Scheme is located within the South West River Basin which is managed by the South and West Somerset River Basin Management Plan².

The EA's Catchment Data Explorer³ was used to assess water bodies present within the Scheme's study area. The WFD compliance mapping for groundwater risk and status assessment was also reviewed.

The relevant river bodies were assessed in the preliminary compliance assessment, and it was concluded that further assessment would only be needed for the KSD water body:

- King's Sedgemoor Drain – Henley Sluice to mouth (water body ID GB108052021150) (Table 3).

Table 3 Water body WFD parameters – King's Sedgemoor Drain – Henley sluice to mouth (<https://environment.data.gov.uk>)

Water body ID	GB108052021150
Water body name	King's Sedgemoor Drain – Henley Sluice to mouth
NGR	ST4081234025
Catchment area	11560.058 ha
Length	27.917 km
Hydromorphological designation	Artificial
Current overall potential (2016 data)	Moderate
Status objective (overall)	Good (2027)
Reasons for not achieving good potential	Mitigation measures assessment: physical modification (Urbanisation, land drainage, flood protection) Phosphates – Diffuse source (livestock); point source (sewage discharge) Dissolved oxygen – Physical modification (land drainage structures; flood protection); Point source (sewage discharge); Diffuse source (livestock) Fish – suspect data
Protected area designation	Conservation of Wild Birds Directive – Somerset Levels and Moors

² South and West Somerset RBMP (2015)

³ Catchment Data Explorer, <http://environment.data.gov.uk/catchment-planning/>

Hydromorphological supporting elements	Supports Good
Current ecological potential (and status objective)	Moderate (Good 2027)
Biological quality elements	Fish – Moderate Invertebrates – Good Macrophytes and Phytobenthos combined - High
Physico-chemical quality elements	Moderate
Chemical quality elements	Good

4.2. Scoping

Table 4 provides a list of elements that are scoped in and out for the purposes of this assessment.

Table 4 Quality elements scoped in/out of assessment for each scheme element

Quality element	Raising of existing informal embankments	Channel widening works (WFD enhancements)	Outfall improvements
Fish	In	In	In
Benthic invertebrates	Out due to works being above the channel and unlikely to affect invertebrates in the water body itself.	In	In
Macrophytes and phytobenthos combined	In	In	In
Thermal conditions	Out due to works being above the channel and unlikely to affect thermal conditions in the water body itself.	In	Out due to minimal works within the channel, and unlikely to affect thermal conditions.

Quality element	Raising of existing informal embankments	Channel widening works (WFD enhancements)	Outfall improvements
Oxygenation conditions	Out due to works being above the channel and unlikely to affect oxygenation in the water body itself. The embankments are setback.	In	Out. Works are unlikely to have an impact at a water body scale due to their nature, and not likely to cause deterioration /change in oxygenation.
Nutrient conditions	In	In	In
Connection to groundwater	Out	In	Out
Quantity and dynamics of flow	Out due to topping up of existing informal embankments and being away from the main channel; there will be no interruption to channel flow.	In	Out
River Continuity	Out	In	Out
River depth and width variation	Out	In	In
Structure and substrate of the river bed	Out	In	In
Riparian zone	In	In	In
Chemical elements and	In. Existing pressure related to	In	In

Quality element	Raising of existing informal embankments	Channel widening works (WFD enhancements)	Outfall improvements
Specific pollutants	<p>phosphate release due to agricultural run-off and sewage treatment discharge (already covered by nutrient conditions).</p> <p>Out. No implications in relation to the release, dispersal or persistence of chemical contaminants or wastewater and influence on the existing pressures related to pesticides or other pollutants.</p>		
INNS	In	In	In

4.3. Assessment against quality elements

Table 5 details a site-specific assessment of the Scheme against quality elements for the scoped in biology, physico-chemical and hydromorphological elements.

Table 5. Screening of the Scheme's Options against Status Objectives and Elements for water quality elements

Key to Impact						
Negative		Negligible		Positive		No change
Scheme element						
WFD element likely to be impacted		Description of impact			Mitigation proposed	
KSD between Sowy/KSD confluence and Parchey Bridge						
Bank raising and reprofiling on left and right banks.	Macrophytes and phytobenthos	During construction: Potential sediment remobilisation during works resulting in potential deterioration in quantity and quality of species alongside river channel. Temporary localised potential impacts. Riparian tree planting and retention of existing vegetation.			Potential indirect impacts from construction stage of the development would be managed and no likely significant effects are anticipated on the water environment. This will be managed through implementation of a SWMP and application of other best practice. The SWMP was developed in agreement with our internal technical specialists and will consider measures to manage spoil heap with reference to up to date and applicable guidance. It will include details of managing spoil, managing sediment pathways on the floodplain, in some areas, no works within 10m of the water course because of the potentially large amount of soil potentially available for entrainment. It would also contain information on how vegetation on floodplain will be reinstated following construction, which includes removal of the turf, re-seeding and careful	
		During operation, there should be an increased species diversity and abundance and potential for planting between flood bank and channel. Creation of additional habitats on area adjacent to channel could be utilised by benthic invertebrates, and/or other species to improve overall species diversity and abundance.				

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			placement of landscape features as supported by landscape planning.
	Fish fauna	<p>During construction: Potential disturbance to species due to noise and to runoff from the working area, which could include temporary interruption to any migration (if occurring); potential for disturbance or loss of species over a localised and temporary event. This is most likely where works are occurring with bank raising and embayment construction, i.e. immediately adjacent to the channel.</p> <p>During operation: No change as a result of bank raising alone.</p>	<p>Potential indirect impacts from construction stage of the development would be managed through sensitive timing and avoiding working in the channel. Timing of works is important and should avoid migration and spawning periods. August to October has been scheduled for works to be undertaken to avoid spawning. Increased sediment availability also needs to be managed as an indirect impact for fish due to timing of works. This will be managed through SWMP and application of other best practice. The SWMP should be agreed with our internal technical specialists and will consider measures to manage spoil heap with reference to up to date and applicable guidance. It will include details of managing spoil, managing sediment pathways on the floodplain, in some areas, no works within 10m of the water course because of the potentially large amount of soil potentially available for entrainment. This would also contain information on how vegetation on floodplain will be reinstated following construction., which includes removal of the turf, re-seeding and careful placement of</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			<p>landscape features as supported by landscape planning.</p> <p>All pollution to be controlled under current legislation and best practice.</p>
	Structure of the riparian zone	<p>During construction: The topping up of embankments may will require plant tracking/movement along the floodplain corridor, potentially damaging habitat within the riparian channel.</p> <p>Vegetation/turfs will have to be removed during construction, or will at least be removed during construction, and subsequently reinstated, replanted or re-seeded.</p> <p>During operation: Embankments will not change structure of riparian zone as already present.</p>	<p>No plant will track within 5m of the watercourses (except where improvement works to sluices required as discussed above, and where strengthening of culverts on left bank of Sowy and KSD is needed).</p> <p>The SWMP would be developed in agreement with our internal technical specialists and will consider measures to manage spoil heap with reference to up to date and applicable guidance. It will include details of managing spoil, managing sediment pathways on the floodplain, in some areas, no works within 10m of the water course because of the potentially large amount of soil potentially available for entrainment. Overplanting to be included as part of erosion control. The SWMP would also contain information on how vegetation on floodplain will be reinstated following construction., which includes removal of the turf, re-seeding and careful placement of landscape features as supported by landscape planning. This also needs to contain information on how vegetation on floodplain will be reinstated</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			<p>following the construction. No likely significant effects are anticipated on the water environment.</p> <p>Geomorphologist and ECoW to be deployed to provide technical guidance on site</p>
	Floodplain connectivity and continuity	<p>During construction: there will be no overall change during this time.</p> <p>During operation: there will be no overall change. The hydromorphic processes will be more variable due to better heterogeneity but overall there will be no change to continuity. This scheme is going to change the degree of floodplain connectivity through embankment raising and increased conveyance but not sufficiently to alter water body status.</p>	<p>Timing of the works is important. They will be undertaken between August and October when the water levels are lower therefore minimising the need to put in measures to prevent flooding out of works during construction. Overall, potential indirect impacts from construction stage of the development will be managed and no likely significant effects are anticipated on the water environment.</p>
	Nutrient conditions	<p>During construction: Sediment remobilisation during works could result in potential deterioration of nutrient conditions within the water course if there was a direct pathway for transport to the river channel. There is evidence of the potential for algal blooms within the water course. There needs to be assurance that these cannot flare up during the works through disturbance of sediment in the channel during works, or</p>	<p>Potential indirect impacts from construction stage of the development would be managed through sensitive timing and avoiding working in the channel. Timing of works is important and is scheduled between August and October, outside of higher river discharges and wet weather. Therefore, runoff into the KSD from areas stripped of vegetation is less likely than at wetter times of year. The SWMP (as outlined above) will also reduce runoff. As a</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		by a temporary pathway from the adjacent land to the channel.	<p>result, potential indirect impacts from construction of the embankments would be managed and no likely significant effects are anticipated on the water environment.</p> <p>The SWMP will establish site-specific measures to ensure nutrient-rich materials do not pollute substrate or water body during the embankment works.</p> <p>All pollution to be controlled under current legislation and best practice.</p>
		<p>Localised bank raising may aid in the reduction of phosphate/algal blooms in the channel because of potential interception of contaminants in agricultural land runoff.</p> <p>There will be no change to water levels on the moors as a result of the lowering of the Sowy levels as these are determined and controlled by the penning structures. There will also be no change in the risk of discharge of farm phosphates. The bank construction will intercept the pathway however where phosphate is not already in the channel.</p>	<p>Mitigation will include application of the SWMP, monitoring of flood levels and flood warnings need to be issued should there be a requirement. There will need to be top soil strip in all areas where raising proposed and also where banks are being reprofiled to win material.</p>
	Connection to designations	Somerset Level and Moors SPA – no anticipated impact to SPA.	A Habitats Regulation Assessment (HRA) has been undertaken which considers potential effects on the Somerset Levels

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			and Moors SPA (see Appendix E of the ES ⁴ and Appendix B of the ES Addendum). The HRA concludes that, with the identified mitigation in place, no significant effects on the integrity of any European designated sites would occur.
Channel widening including two stage channel	Macrophytes and phytobenthos	<p>During construction: Works will require plant tracking/movement along the floodplain corridor, potentially damaging habitat within the riparian channel. Vegetation/turfs will have to be removed during construction, or will at least be removed during construction, and subsequently reinstated, replanted or re-seeded. Potential sediment remobilisation during works resulting in potential deterioration in quantity and quality. Temporary localised potential impact.</p> <p>During operation, there should be an increased in-stream vegetation habitat due to diverse flow conditions and creation of marginal berms or widening existing marginal berms. The backwaters/embayments are circa 10 metres long at regular intervals so will</p>	Potential indirect impacts from construction stage of the development would be managed and no likely significant effects are anticipated on the water environment. This will be managed through SWMP and application of other best practice. The SWMP should be agreed with the technical specialists and will consider measures to manage spoil heap with reference to up to date and applicable guidance. It will include details of managing spoil, managing sediment pathways on the floodplain, in some areas, no works within 10m of the water course because of the potentially large amount of soil potentially available for entrainment. This also needs to contain information on how vegetation on floodplain will be reinstated following construction., which includes removal of the turf, re-seeding and careful placement of

⁴ Available at the following weblink: <https://consult.environment-agency.gov.uk/wessex/river-sowy-and-ksd-enhancements/>.

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		<p>improve overall habitat diversity and abundance and will ensure a suitable corridor for habitat is put in place without homogenising plant communities.</p> <p>Low/backwater flows will allow diverse habitat during operation. Planting of rhizomes and wet woodland species, including willows will also improve habitat diversity and abundance.</p>	<p>landscape features as supported by landscape planning.</p> <p>Continuous lengths of pre-vegetated coir rolls would protect the river edge of the berm from erosion and pre-vegetated coir pallets would seed the bank side of the berm with marginal species. Plug planting and/or translocation of existing marginal planting will be used to promote benefits to macrophytes and wider habitat. Backwater channels would be planted with either/both pre-vegetated coir rolls and</p>
	Benthic invertebrate fauna	<p>During construction: Potential sediment remobilisation during works with potential for smothering downstream channel bed features (localised and temporary sediment remobilisation so impact limited).</p> <p>During operation: Decreased sediment load to channel following a major flood event due to more storage in two-stage channel leading to decreased nutrient enrichment. Habitat niches improve abundance and richness.</p> <p>Creation of additional habitats which can be utilised by benthic invertebrates.</p>	<p>Potential indirect impacts from construction stage of the development would be managed and no likely significant effects are anticipated on the water environment. This will be managed through SWMP and application of other best practice. The SWMP should be agreed with the technical specialists and will consider measures to manage spoil heap with reference to up to date and applicable guidance. It will include details of managing spoil, managing sediment pathways on the floodplain, in some areas, no works within 10m of the water course because of the potentially large amount of soil potentially available for entrainment. This also needs to contain information on how vegetation on floodplain</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			<p>will be reinstated following construction, which includes removal of the turf, re-seeding and careful placement of landscape features as supported by landscape planning. This also needs to contain information on how vegetation on floodplain will be reinstated following construction.</p> <p>In addition, continuous lengths of pre-vegetated coir rolls would protect the river edge of the berm from erosion and pre-vegetated coir pallets would seed the bank side of the berm with marginal species. Backwater channels would be planted with either/both pre-vegetated coir rolls and pallets. Plug planting and/or translocation of existing marginal planting will be used to promote benefits and habitat for various species.</p>
	Fish Fauna	During construction: Potential disturbance to species within the river at this point, due to close proximity of works, which could include temporary interruption to any migration (if occurring); potential for disturbance or loss of species over a localised and temporary event.	Potential indirect impacts from construction stage of the development would be managed through sensitive timing and avoiding working in the channel. Timing of works is important and should avoid migration and spawning periods. August to October has been scheduled for works to be undertaken to avoid spawning.

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		<p>During operation: provision of better habitat to improve conditions for fish during spawning and migration. Embayments/backwaters potentially provide nursery areas. The backwater design allows for sufficient width, in conjunction with the associated island to improve the sustainable function of backwater without it quickly and efficiently silting up or becoming choked by vegetation.</p>	<p>Increased sediment availability also needs to be managed as an indirect impact for fish. This will be managed through SWMP and application of other best practice. The SWMP has not been produced yet but should include details of managing spoil, managing sediment pathways within the channel and on the floodplain. Construction of the backwaters would offer a direct pathway to the channel. This needs to be controlled by silt traps or other suitable mitigation.</p> <p>ECoW to be used on site.</p> <p>All pollution to be controlled under current legislation and best practice.</p>
	Quantity and dynamics of water flow	<p>During construction: Anticipate that the working method to allow formation of new channel features will require some localised coffer-damming and dewatering and/or over-pumping. Any consequences for the dynamics of flow would be temporary and reversible.</p> <p>During operation: Improvement to conveyance and decreasing flood risk. The creation of embayments and/or two-stage channel will lead to more diverse flow variability and habitat niches. The backwater design allows for sufficient</p>	<p>Timing of the works is important. They will be undertaken between August to October when the water levels are lower therefore minimising the need to put in measures to prevent flooding out of works during construction. As water levels will be lower, the need for pumps and cofferdams will be minimised. Silt traps or silt curtains also need to be put in place during construction to further mitigate any potential entrainment into the channel.</p> <p>Geomorphologist to attend on site during works to provide detailed guidance.</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		width, in conjunction with the associated island, to improve the sustainable function of backwater without it quickly silting up or becoming choked by vegetation.	
	River depth and width variation:	No change during construction. During operation: Improvement to river channel cross-Section, from current trapezoidal cross-Section to diverse channel profiles, will increase river width and provide flow and habitat diversity.	Potential indirect impacts from construction stage of the development would be managed and no likely significant effects are anticipated on the water environment.
	Structure and substrate of the river bed	During construction: Potential change to structure of substrate due to construction. Sediment remobilisation during works could result in potential deterioration in water quality, and potential for greater concentrations of fines downstream. Temporary localised potential impact. During operation: Potential improved sediment variability. Aggregation of fines (potential for) in slacker areas of water	Sediment mobilisation into the water column will need to be minimised. The SWMP (as outlined above) will include specific measures for in-channel works to minimise the risk of resuspending sediment and of releasing any plumes beyond the working area. Thus, the potential indirect impacts from construction stage of the development would be managed and no likely significant effects are anticipated on the water environment.
	Structure of the riparian zone	During construction: The creation of WFD enhancements will require the removal of existing riparian vegetation. Sediment remobilisation during works could result in the potential deterioration	Potential indirect impacts from construction stage of the development would be managed. An EAP (see Appendix F of the ES Addendum) will refer to site-specific measures to mitigate for effects on the

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		<p>of the riparian zone, and risk of materials entering the water course.</p> <p>During operation: Improvement to overall riparian morphological diversity and species diversity. Morphological diversity improves habitat by creating a variety of habitat niches for various aquatic species. Planting of rhizomes and wet woodland species, including willows will improve habitat diversity and abundance.</p>	riparian zone, such as translocating areas of vegetation. No likely significant effects are anticipated on the water environment.
	River continuity	<p>During construction: There will be no overall change during this time.</p> <p>During operation: there will be no overall change in longitudinal continuity. The hydromorphic processes will be more variable due to better heterogeneity but overall there will be no change to continuity. However, the scheme is going to slightly reduce the degree of floodplain connectivity through embankment raising and increased conveyance but not sufficiently to alter water body status.</p>	Timing of the works is important. They will be undertaken between August and October when the water levels are lower therefore minimising the need to put in measures to prevent flooding out of works during construction. Potential indirect impacts from construction stage of the development will be managed and no likely significant effects are anticipated on the water environment.
	Nutrient conditions	During construction: Sediment remobilisation during works could result in potential deterioration of nutrient conditions within the water course.	Any phosphates occurring in the existing riparian sediments are due to agricultural/discharge issues outside of the Scheme and cannot be mitigated for within

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		<p>During operation: Habitat diversity improves oxygenation, clarity (reduced silt within the water column) and sediment transport, and therefore overall water quality. However, decreased uncontrolled flooding of agricultural land due to more water being stored within the two-stage channel leading to potential decreased diffuse pollution into the water body.</p> <p>Also potential interception of contaminants in the widened riparian zone reducing the load reaching the channel.</p>	<p>this Scheme. Potential indirect impacts from construction stage of the modified channel will need to be carefully managed to ensure that sediment mobilisation into the water column is minimised, especially under conditions of high light and temperature that could encourage algal blooming.</p> <p>Since the work is scheduled for August to October in order to be outside of higher river discharges and wet weather there is the potential to coincide with sunny and warm spells of weather. The SWMP (as outlined above) will include specific measures for in-channel works to minimise the risk of resuspending sediment and of releasing any plumes beyond the working area.</p> <p>The SWMP would be developed in agreement with our internal technical specialists, and would consider measures to manage spoil heap with reference to up to date and applicable guidance. It will include details of managing spoil, managing sediment pathways on the floodplain, in some areas, no works within 10m of the water course because of the potentially large amount of soil potentially available for entrainment. It would also contain</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			<p>information on how vegetation on floodplain will be reinstated following construction., which includes removal of the turf, re-seeding and careful placement of landscape features as supported by landscape planning.</p> <p>All pollution to be controlled under current legislation and best practice.</p>
	Oxygenation conditions	<p>During construction: See 'Nutrient conditions' above. Sediment remobilisation during works in summer months when water temperature is likely to be elevated could result in localised decline in dissolved oxygen levels.</p> <p>During operation: Habitat diversity improves oxygenation, clarity (reduced silt within the water column) and sediment transport, and therefore overall water quality. Water held in the two-stage channel/embayments is likely to have a negligible impact on dissolved oxygen levels of the overall water body. The widened channel can be operated at higher flows with similar velocities and water depths to pre-scheme as a result of summer penning.</p>	<p>See 'Nutrient conditions' above.</p> <p>Potential indirect impacts from construction stage of the modified channel will need to be carefully managed to ensure that sediment mobilisation into the water column is minimised, especially under conditions of high light and temperature that could encourage algal blooming.</p> <p>Since the work is scheduled for August to October in order to be outside of higher river discharges and wet weather there is the potential to coincide with sunny and warm spells of weather. The SWMP (as outlined above) will include specific measures for in-channel works to minimise the risk of resuspending sediment and of releasing any plumes beyond the working area.</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
	Invasive Non-Native Species (INNS)	<p>During construction: Risk of spread of invasive species if present.</p> <ul style="list-style-type: none"> • Himalayan Balsam (<i>Impatiens glandulifera</i>) was recorded in the study area on the Parrett. • Curly water thyme (<i>Lagarosiphon major</i>) <p>Further information on non-native, invasive plant species was also provided by the Somerset Drainage Board Consortium stating that parrots feather (<i>Myriophyllum aquaticum</i>) is widespread on Aller Moor and known to be present in the Langacre Rhyne. The RSPB have also recorded on Othery Rhyne. The extent of Parrots feather is increasing as no control measures have been implemented. Also, water lettuce (<i>Pistia stratiotes</i>), water hyacinth (<i>Eichhornia crassipes</i>), Water fern (<i>Azolla filiculoides</i>) have been found on the KSD in recent years, but these are not thought to be currently present in the study area. Nuttall's waterweed (<i>Elodea nuttallii</i>) has been recorded on the Sowy but is not thought to be currently present in the study area. There are also records of floating pennywort (<i>Hydrocotyle</i></p>	<p>With appropriate mitigation these will be managed to ensure no significant effects. Invasive Species Management Plan to be put in place. Ensure no spread within the water channel. Given the recorded presence of, and potential for, a number of non-native invasive plant species, an Invasive Species Management Plan would be required. This would highlight the species likely/with potential to be present in the construction area and the biosecurity measures needed to prevent the spread of these species and thus to ensure compliance with Wildlife and Countryside Act 1981 (as amended) where species are listed on Schedule 9 of the Act. These biosecurity measures would include;</p> <ul style="list-style-type: none"> • Pre-construction survey for non-native invasive plant species. • Environmental Clerk of Works to undertake toolbox talk for all site workers (and visitors when appropriate) to aid identification and appropriate responses to encountering invasive species. • Areas of possible contamination should be identified in the site management plan.

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		<p><i>ranunculoides</i>) and Canadian pond weed (<i>Elodea canadensis</i>) and in drainage systems connected to the Sowy corridor and there is therefore a significant likelihood that floating pennywort may already be in, or close to the Sowy, or may become present during the implementation period of the scheme.</p>	<ul style="list-style-type: none"> Where contaminated soil, materials or water are located, signage should be erected to indicate them. Only accepting machinery to site that is clean. Pressure washing in a designated area for all vehicles before entering and after leaving site to avoid accidental transfer of invasive plant material. Personnel working on or between sites should ensure their clothing and footwear are cleaned where appropriate to prevent spread All wash facilities including waste water from washing vehicles, equipment or personnel should be managed in a responsible way so as not to cause harm to the environment. <p>If present, report to competent authority.</p>
	Connection to designations	Somerset Level and Moors SPA – no anticipated impact to SPA.	A Habitats Regulation Assessment (HRA) has been undertaken which considers potential effects on the Somerset Levels and Moors SPA (see Appendix C of the ES ⁴ and Appendix B of the ES Addendum). The HRA concludes that, with the identified mitigation in place, no significant effects on

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			the integrity of any European designated sites would occur.
Raising of the existing concrete headwalls by 300-400mm.	Macrophytes and phytobenthos	During works potential deterioration in quantity and quality of vegetation through direct impacts of groundworks. Temporary localised potential impact.	Potential indirect impacts from construction stage of the development will be managed and no likely significant effects are anticipated on the water environment. The SWMP should be agreed with the technical specialists, and will consider measures to manage spoil heap with reference to up to date and applicable guidance. It will include details of managing spoil, managing sediment pathways on the floodplain, in some areas, no works within 10m of the water course because of the potentially large amount of soil potentially available for entrainment.
		During operation: no change.	Potential indirect impacts from construction stage of the development will be managed through sensitive working method and no likely significant effects are anticipated on the water environment.
	Benthic invertebrate fauna	Sediment could be remobilised during works with potential for smothering downstream channel bed features (localised and temporary sediment remobilisation so impact limited).	
		During operation: no change.	All pollution to be controlled under current legislation and best practice.
	Fish fauna	During construction: disturbance to species within the river at this point, which could include temporary interruption to any migration (if occurring) between KSD and	Potential indirect impacts from construction stage of the development will be managed through sensitive timing (to avoid fish migration) and working method and no

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		Cossington Right or Chilton Right rhynes; potential for disturbance of species over a localised and temporary event.	likely significant effects are anticipated on the water environment.
		No change during operation from current conditions.	
	INNS	<p>Risk of spread of invasive species if present.</p> <ul style="list-style-type: none"> • Water fern (<i>Azolla filiculoides</i>) was recorded on a ditch in a field adjacent to the KSD near Westonzoyland. • Himalayan Balsam (<i>Impatiens glandulifera</i>) was recorded in the study area on the Parrett. • Canadian pond weed (<i>Elodea canadensis</i>) was recorded in an agricultural drainage ditch. • Nuttall's waterweed (<i>Elodea nuttallii</i>) was recorded at two locations in the Sowy. <p>Further information on non-native, invasive plant species was also provided by the Somerset Drainage Board Consortium stating that parrot's feather (<i>Myriophyllum aquaticum</i>) is widespread on Aller Moor and known to</p>	Invasive Species Management Plan to be put in place. Ensure no spread within the water channel. See above for details.

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		be present in the Langacre Rhyne. The extent of Parrots feather is increasing as no control measures have been implemented. Also, water lettuce (<i>Pistia stratiotes</i>) and water hyacinth (<i>Eichhornia crassipes</i>) have been found on the KSD in recent years, but these are not thought to be currently present in the study area. There are also records of floating pennywort (<i>Hydrocotyle ranunculoides</i>) in drainage systems connected to the Sowy corridor and there is therefore a significant likelihood that floating pennywort may already be in, or close to the Sowy, or may become present during the implementation period of the scheme.	
	Connection to designations	Somerset Level and Moors SPA – no anticipated impact to SPA.	A Habitats Regulation Assessment (HRA) has been undertaken which considers potential effects on the Somerset Levels and Moors SPA (see Appendix C of the ES ⁴ and Appendix B of the ES Addendum). The HRA concludes that, with the identified mitigation in place, no significant effects on the integrity of any European designated sites would occur.
Installation of sheet piles	Macrophytes and phytobenthos	During construction: Potential sediment remobilisation during works resulting in potential deterioration in quantity and	Potential indirect impacts from construction stage of the development will be managed and no likely significant effects are

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		quality, and potential loss in places. Temporary localised potential impact.	anticipated on the water environment. This will be managed through SWMP and application of other best practice.
	Benthic invertebrate fauna	During operation, there should be no change from current conditions once the river has returned to normal conditions.	Potential indirect impacts from construction stage of the development will be managed through sensitive working method and no likely significant effects are anticipated on the water environment. Use of ECoW on site.
	Fish fauna	During construction: Potential disturbance to species within the river at this point, due to close proximity of works, which could include temporary interruption to any migration (if occurring) between KSD and Cossington Right or Chilton Right rhynes; potential for disturbance or loss of species over a localised and temporary event. During operation: no change.	Potential indirect impacts from construction stage of the development will be managed through sensitive timing (to avoid fish migration) and working method and no likely significant effects are anticipated on the water environment. Compile and adhere to an EAP and ensure materials do not pollute substrate or water body. Consider ECoW on site during construction.
		During operation: No change and no potential for channel width diversity	All pollution to be controlled under current legislation and best practice.

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		apart from where sheet piling is absent, and then potential for outflanking.	
	Structure and substrate of the river bed	<p>During construction: Potential change to structure of substrate due to construction. Sediment remobilisation during works could result in potential for greater concentrations of fines downstream. Temporary localised potential impact.</p> <p>During operation: No change. From current conditions.</p>	Potential indirect impacts from construction stage of the development will be managed through the SWMP and no likely significant effects are anticipated on the water environment
	Nutrient conditions	<p>During construction: Sediment remobilisation during works could result in potential deterioration of nutrient conditions within the water course.</p> <p>During operation: No change</p>	<p>Any phosphates occurring in the existing sediment are due to agricultural/discharge issues outside of the Scheme and cannot be mitigated for within this Scheme.</p> <p>Potential indirect impacts from construction of the outfalls will need to be carefully managed to ensure that sediment mobilisation into the water column is minimised, especially under conditions of high light and temperature that could encourage algal blooming.</p> <p>Since the work is scheduled for August to October in order to be outside of higher river discharges and wet weather there is the potential to coincide with sunny and warm spells of weather. The SWMP (as outlined above) will include specific</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			<p>measures for in-channel works to minimise the risk of resuspending sediment and of releasing any plumes beyond the working area.</p> <p>The SWMP will establish site-specific measures to ensure nutrient-rich materials are properly managed. This might include specific weather-dependent limits on working activities.</p> <p>All pollution to be controlled under current legislation and best practice</p>
	INNS	<p>During construction: Risk of spread of invasive species if present.</p> <ul style="list-style-type: none"> • Water fern (<i>Azolla filiculoides</i>) was recorded on a ditch in a field adjacent to the KSD near Westonzoyland. • Himalayan Balsam (<i>Impatiens glandulifera</i>) was recorded in the study area on the Parrett. • Canadian pond weed (<i>Elodea canadensis</i>) was recorded in an agricultural drainage ditch. • Nuttall's waterweed (<i>Elodea nuttallii</i>) was recorded at two locations in the Sowy. 	<p>With appropriate mitigation these will be managed to ensure no significant effects. Invasive Species Management Plan to be put in place. Invasive species are 'reportable' but the operatives need to be provided with this guidance.</p> <p>If present, report to competent authority.</p> <p>Given the recorded presence of, and potential for, a number of non-native invasive plant species, an Invasive Species Management Plan would be required. This would highlight the species likely/with potential to be present in the construction area and the biosecurity measures needed to prevent the spread of these species and thus to ensure compliance with Wildlife and Countryside Act 1981 (as amended) where</p>

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
		<p>Further information on non-native, invasive plant species was also provided by the Somerset Drainage Board Consortium stating that parrots feather (<i>Myriophyllum aquaticum</i>) is widespread on Aller Moor and known to be present in the Langacre Rhyne. The extent of Parrots feather is increasing as no control measures have been implemented. Also, water lettuce (<i>Pistia stratiotes</i>) and water hyacinth (<i>Eichhornia crassipes</i>) have been found on the KSD in recent years, but these are not thought to be currently present in the study area. There are also records of floating pennywort (<i>Hydrocotyle ranunculoides</i>) in drainage systems connected to the Sowy corridor and there is therefore a significant likelihood that floating pennywort may already be in, or close to the Sowy, or may become present during the implementation period of the scheme.</p>	<p>species are listed on Schedule 9 of the Act. These biosecurity measures would include;</p> <ul style="list-style-type: none"> • Pre-construction survey for non-native invasive plant species. • Environmental Clerk of Works to undertake toolbox talk for all site workers (and visitors when appropriate) to aid identification and appropriate responses to encountering invasive species. • Areas of possible contamination should be identified in the site management plan. • Where contaminated soil, materials or water are located, signage should be erected to indicate them. • Only accepting machinery to site that is clean. Pressure washing in a designated area for all vehicles before entering and after leaving site to avoid accidental transfer of invasive plant material. • Personnel working on or between sites should ensure their clothing and footwear are cleaned where appropriate to prevent spread

Scheme element	WFD element likely to be impacted	Description of impact	Mitigation proposed
			<ul style="list-style-type: none"> • All wash facilities including waste water from washing vehicles, equipment or personnel should be managed in a responsible way so as not to cause harm to the environment.
	Connection to designations	Somerset Level and Moors SPA – no anticipated impact to SPA.	A Habitats Regulation Assessment (HRA) has been undertaken which considers potential effects on the Somerset Levels and Moors SPA (see Appendix C of the ES ⁴ and Appendix C of the ES Addendum). The HRAs conclude that, with the identified mitigation in place, no significant effects on the integrity of any European designated sites would occur.

5. Assessment of the scheme against mitigation measures

Within each RBMP, there is a list of mitigation measures, or environmental improvements, which need to be implemented in order to improve the ecology of water bodies by a specified date in order for the UK to meet the target date set by the WFD. Part of the a WFD compliance assessment is to consider relevant mitigation measures and assess whether a proposed scheme can contribute to them or might obstruct any of them from being delivered.

Table 6 provides a list of all mitigation measures applicable to the Scheme and the KSD water body specifically. There were not any mitigation measures data to contribute to this assessment as they were not readily available, so these are proposed based on experience/knowledge of other mitigation measures for other similar schemes.

Table 6 Mitigation measures put forward to support the RBMP and the Scheme

Mitigation Measure	Will the Scheme help to achieve or contribute to mitigation measure?
Flood protection	Align and attenuate flow to minimise impact on ecology
	Create habitat
	Educate landowners impacts to Hydromorphology and Hydromorphological harm
	Enhance existing structures to improve ecology
	Ensure maintenance minimises habitat impact
	Manage in-channel and riparian vegetation
	Manage realignment of flood defences
	Preserve or restore habitats
	Remove and prevent further dispersal of invasive non-native species

Mitigation Measure	Will the Scheme help to achieve or contribute to mitigation measure?
	Remove obsolete structure(s)
	Remove or enhance set-back embankments
	Remove or soften hard bank engineering
	Restore or increase floodplain (lateral) connectivity
	Restore or Increase In-channel morphological diversity
	Retain habitats
Land drainage	Align and attenuate flow to minimise impact on ecology
	Create habitat
	Educate landowners impacts to Hydromorphology and Hydromorphological harm
	Enhance existing structures to improve ecology
	Ensure maintenance minimises habitat impact
	Preserve or restore habitats
	Remove and prevent further dispersal of invasive non-native species
	Restore or increase floodplain (lateral) connectivity

Mitigation Measure	Will the Scheme help to achieve or contribute to mitigation measure?
Restore or Increase In-channel morphological diversity	Yes, through enhancements
Retain habitats	Yes, through design

In summary, it is unlikely that the nature of the works would impede any mitigation measures that might be put forward as part of the RBMP or water body specific measures. Further, the nature of the works are unlikely to impede achievement of GEP.

6. Cumulative assessment

None of the other proposed schemes scoped into the cumulative assessment within **Chapter 2.3 of the ES Addendum** are considered to offer the potential for cumulative effects on the KSD water body, predominantly due to their distance, and scale of development.

7. Compliance conclusions

Referring back to the points raised in Chapter 1, and the assessment in Chapters 4 to 6, the reasoning put forward for the need for a detailed assessment can be put aside for the following reasons:

- Channel widening, deepening, straightening or realigning is a high-risk activity to WFD objectives whatever the length or extent. Reprofiling works are high risk where the length of channel affected is greater than 100 metres. The risks to a number of quality elements have been identified but these can each be mitigated through appropriate working methods and precautionary measures that will be incorporated into a SWMP which will specifically consider risks around sediment control and associated water quality, and an EAP. Once completed, the Scheme will provide a much more tangible benefit in that it will improve the physical condition of the artificial water body, which is currently an oversized trapezoidal drainage channel. The WFD benefits put forward as part of the Scheme, in conjunction with improved hydromorphological condition (for example, improved heterogeneity, improved abundance and variability in species within the channel and riparian corridor) far exceed the implications of channel widening being a high-risk activity.
- Embankment works are high-risk where the length of channel affected is greater than 100 metres. However, the works, including incorporation of enhancements, should benefit the water body. During operation the works will prevent or reduce adverse water quality side-effects from flooding (sewer overflow, arable soil loss). Additionally, they are already on areas of relatively low floodplain value and are being widened on the dry side in all cases, and therefore their adverse consequences are limited.

The overall improvement to the waterbody as a result of this Scheme would suggest that all WFD quality elements will be improved or unaffected.

Taking into consideration the above points, and the anticipated impacts of the Scheme on the biological, physico-chemical and hydromorphological quality elements, the Scheme not only is unlikely to compromise progress towards achieving GEP or cause a deterioration of the overall ecological potential of the King's Sedgemoor Drain – Henley Sluice to mouth water body, it is also likely to actively support progress towards GEP. The aim of the Scheme is largely to improve the physical condition of an artificial system. This is dependent on the implementation of the design and construction of mitigation measures that are identified in this assessment. The overall design will improve overall WFD elements, and is being designed to specifically include WFD benefits, such as variable channel widths and depths, two-stage channels and embayments for improved marginal habitat.

Table 8 Compliance of the scheme with the environmental objectives of the WFD

Environmental Objective	Scheme	Compliance with the WFD Directive
No changes affecting high status sites	After consideration as part of the detailed compliance assessment,	Yes. A HRA has been undertaken in support of the full Scheme. It

Environmental Objective	Scheme	Compliance with the WFD Directive
	none of the options considered will cause a change to the high-status sites in the study area if mitigation is put in place.	concludes that no adverse effects on the integrity of European sites would occur with the identified mitigation in place.
No changes that will cause failure to meet surface water good ecological status or potential or result in a deterioration of surface water ecological status or potential	After consideration as part of the detailed compliance assessment, the Scheme options will not cause deterioration in the status of the water bodies if mitigation is put in place.	Yes
No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies	The Scheme options will not cause a permanent exclusion or compromise achieving the WFD objectives in any other bodies of water within the River Basin District.	Yes
No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status.	The Scheme options will not cause deterioration in the status of the of the groundwater bodies.	Yes