

Water Framework Directive Assessment (RAPID Gate Two)

South Lincolnshire Reservoir

November 2022 Confidential This page left intentionally blank for pagination.

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Issue and Revision Record

| Revision | Date | Originator | Checker | Approver | Description |
|----------|----------|------------|---------|-----------------|---|
| P01 | Sep-22 | ER | MR | MD JR | Initial issue |
| | | | | JF | |
| P02 | Nov-22 | ER | MD | JF | Working copy amendments in progress after client review |
| P03 | 10/11/22 | ER | MD | JF | Final version after client amendments |
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Document reference: 421065060 | 421065060-GT2-MMD-XX-XX-RP-Z-0009 | P03 |

Information class: Standard

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Executive summary

This Water Framework Directive (WFD) assessment supports the Environmental Assessment Report (EAR) that accompanies the gate two submission to the Regulators' Alliance for Progressing Infrastructure Development (RAPID) for the South Lincolnshire Reservoir (SLR) Strategic Resource Option (SRO). This report presents the findings of the WFD assessment for all the scheme elements including: abstraction, conveyance including pumps, storage, treatment and distribution into supply and the reservoir.

The two-stage WFD assessment follows the approach outlined in the All Company Working Group (ACWG) framework for undertaking WFD assessments for SROs (ACWG, 2020).

Level 1 assessment identified 24 waterbodies which could potentially be affected by the scheme. Following the Level 1 assessment, seven of these waterbodies were identified as requiring further assessment, due to the potential effects on the WFD waterbodies.

The findings from the Level 2 assessment are:

- A potential major adverse risk (risk of deterioration) to the Swaton Drains (ID: GB105030056515) has been identified. Within the reservoir footprint over 2.5km of open channel would be lost, along with 28% of the catchment. The loss of open channel would impact on habitat, flow and hydromorphology in this waterbody.
- A potential minor localised risk (no risk of deterioration) to the South Beck (ID: GB105030056520) has been identified from the loss of open watercourse and loss of up to 4% of open watercourse within the catchment due to the presence of the reservoir. This loss of catchment and watercourses would impact on habitat, flow and hydromorphology in this waterbody.
- A potential major adverse risk (risk of deterioration) to the Trent from Soar to Beck (ID: GB104028053110) was identified as a result of the new surface water abstraction.
 Abstraction rates are expected to be <10% of the total volume of the Trent catchment and the change in flow and velocity has the potential to impact biological elements. Further investigation is required to determine the full extent of the impacts. A potential adverse risk was also identified due to potential for changes in water quality due to the surface water abstraction.</p>
- A potential major adverse risk (risk of deterioration) to the Witham conf Cringle Bk to conf Brant (ID: GB105030056780) has been identified as a result of the discharge from the Trent from Soar to Beck. A high-level water quality assessment of the proposed transfer was conducted, it concludes there is an expected 69% increase in ammonia. A potential major adverse risk (risk of deterioration) to the Witham conf Brant to conf Catchwater Drain (ID: GB105030062370) and the Witham conf Catchwater Drain to conf Bain (ID: GB205030062425) have been identified as a result of the discharge into the Witham conf Cringle Bk to conf Brant (ID: GB105030056780). A high-level water quality assessment concludes there is an expected 46% increase in phosphate by the time it reaches both catchments.
- A potential major adverse risk (risk of deterioration) to the Lower Witham conf Bain to Grand Sluice (ID: GB205030062426) has been identified as a result of the discharge from the Witham conf Cringle Bk to conf Brant (ID: GB105030056780). A high-level water quality assessment, concludes there is an expected 46% increase in phosphate by the time it reaches the catchment. A potential adverse effect (risk of deterioration) was also identified for biological status elements due to the transfer of water from upstream and subsequent abstraction at this waterbody leading to changes in water velocity and level, which could impact on biological status elements.

Further WFD assessment will be required during the next stages of project development (i.e. for gate three and beyond) to improve the levels of certainty for the WFD related risks outlined in this assessment, and to identify mitigation where required.

1 Introduction

1.1 Overview

This report supports the Environmental Appraisal for the scheme as part of the South Lincolnshire Reservoir (SLR) Strategic Resource Option (SRO) gate two submission to the Regulators' Alliance for Progressing Infrastructure Development (RAPID). It presents the findings of the Water Framework Directive (WFD) assessment of the scheme.

1.2 South Lincolnshire Reservoir

A new strategic reservoir in Lincolnshire, referred to as the South Lincolnshire Reservoir (SLR), has been proposed for development as one of several nationally strategic water resource options required to address increasing deficits in public water supply. The scheme is being is promoted by Anglian Water and is being progressed through the fast-tracked delivery framework overseen by the Regulatory Alliance for Progressing Infrastructure Development (RAPID).

The SLR has previously progressed through gate one in 2021, the first opportunity to check progress on investigations and development of solutions in the gated process and is now at gate two. Gate two is intended to look at solutions in more detail, with focus on ensuring that funding for continued investigation and development of solutions is aligned to water resources planning.

This report presents a scheme wide WFD assessment including: abstraction, conveyance including pumps, storage, treatment and distribution into supply and the reservoir.

1.3 Scheme overview

The proposed reservoir site is located in the South Lincolnshire area. It is located approximately 7km southeast of the town of Sleaford, between the settlements of Swaton, Scredington and Helpringham in the North Kesteven District Council area. At its greatest dimensions the reservoir is approximately 2.6km wide and 3.2km long to the embankment toe. This is based on the initial concept design and is subject to further work at gate three.

It is proposed that water will be abstracted from the River Witham, from a location assumed to be between Chapel Hill and Langrick Bridge. It is proposed that flow in the River Witham will be supported via a transfer from the River Trent. The intake is currently assumed to be near Newark-on-Trent and transferred to River Witham near Claypole.

Further details on the scheme are set out in Section 2.

1.4 Methodology

1.4.1 Approach to WFD assessment for SROs

The Water Framework Directive (WFD) is transposed into law for England and Wales through *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003* and updated in 2017¹.

The WFD requires all waterbodies (both surface and groundwater) to achieve 'good status or potential'. The Directive also requires that waterbodies experience no deterioration in status or

¹ https://www.legislation.gov.uk/uksi/2017/407/made

potential. Good status/potential is a function of good ecological status/potential (biological, physico-chemical and hydromorphological elements and specific pollutants) and good chemical status (Priority Substances and Priority Hazardous Substances).

The All Company Working Group (ACWG)² has developed a consistent framework for undertaking WFD assessments for SROs to demonstrate that options will not cause deterioration in status/potential of any WFD waterbodies. The assessment considers mitigation that would need to be put in place to protect waterbody status/potential. The assessment also considers WFD future objectives to ensure the option would not preclude affected WFD waterbodies from reaching good status/potential.

Two stages of assessment are completed under the ACWG WFD approach, an initial Level 1 basic screening and a Level 2 detailed impact screening. These are conducted/reported using a spreadsheet assessment tool which is automated based on option information for Level 1 and expert judgment for Level 2.

This report includes the WFD assessment of the reservoir footprint, abstractions, discharges, and transfers associated with the potential reservoir.

1.4.2 Level 1 – basic screening

Level 1 assessment follows these steps:

- Identify affected waterbodies
- Review SRO option information
 Identify possible impacts
- Apply 'embedded' mitigation measures
- Calculate screening score (using a 6-point scale see Table 1.1) to 'screen out'
 waterbodies and options with no or minor localised (no risk of deterioration) potential
 impacts from further assessment (score of 1 or less).

The process involves the identification of all activities involved in construction, operation and decommissioning for the SRO and identification of all WFD waterbodies which these activities may affect.

Following this, each activity is automatically assigned an impact score using the predetermined scores, as outlined in Table 1.1. The scores assumes some basic embedded mitigation is applied. If these mitigation measures do not apply or further measures are included in the design, then the impact score can be reassessed and the score manually updated. The mean and maximum impact score is then calculated for each waterbody. If the maximum impact is 1 or less, then the waterbody is not to be considered further and no further action is needed. If the maximum impact score is greater than 1 (i.e. there is the potential for deterioration at a waterbody scale) then the waterbody is taken forward into the level 2 assessment.

The outcomes of the Level 1 assessment are summarised in Section 5.1 and Appendix A. Where waterbodies and option impacts were 'screened in', they have been taken forward to the Level 2 assessment.

² All Company Working Group (Nov 2020). Water Framework Directive: Consistent framework for undertaking no deterioration assessments

Table 1.1: Impact scoring system used for WFD assessment

| Impact | Score | Description |
|-----------------|-------|---|
| Very beneficial | -2 | Impacts that, taken on their own, have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody. |
| Beneficial | -1 | Impacts that, when taken on their own, have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements. |
| No/minimal | 0 | No measurable change in the quality of the water environment or the ability for target WFD objectives to be achieved. |
| Low | 1 | Impacts that, when taken on their own, have the potential to lead to a minor localised, short-term and fully reversible effects on one or more of the quality elements but would not result in the lowering of WFD status. Impacts would be very unlikely to prevent any target WFD objectives from being achieved. |
| Medium | 2 | Impacts that, when taken on their own, have the potential to lead to a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status. Impacts have the potential to prevent target WFD objectives from being achieved. |
| High | 3 | Impacts when taken on their own have the potential to lead to a significant effect and permanent deterioration of WFD status. Potential for high impact on preventing target WFD objectives from being achieved. |

1.4.3 Level 2 – detailed impact assessment

The second stage of WFD assessment has been completed for waterbodies in the scheme that were screened in at Level 1, following the next steps:

- Waterbody scale detailed assessment of impacts to each WFD quality element (biological quality elements, hydromorphological supporting elements, physio-chemical quality elements, priority hazardous substances, priority substances and specific pollutants) of the footprint of the proposed site³.
- Assessment of data confidence level and design certainty confidence levels are
 assigned for each assessment, based on professional judgement of the quality and
 availability of both physical data and design information about the option at the time of
 assessment. Requirements for further investigations, data and/or design information
 required in order to raise the level of confidence for future gates is listed in the WFD
 assessment (Level 2 summary).
- Identification of further mitigation needs.
- Assessment of impacts after mitigation (scoring on a 6-point scale).
- Identification of activities to improve the certainty of assessment outcomes.

The outcomes of the Level 2 assessments are summarised in Section 5.2 and Appendix B.

1.4.4 WFD for gate three and beyond

Where waterbodies and option impacts have been identified, recommendations have been made for mitigation and increasing the confidence in the assessment. This is expected to be through increasing the level of detail available during later stages of the development of the scheme and

³ Gate one assessed all activities associated with the SLR SRO, however a change in scope has resulted in the WFD only assessing the reservoir footprint only.

for subsequent gateways if the option is progressed. Both the Level 1 and 2 WFD assessment will be updated at gate three following updated design information.

It is noted that the Cycle 3 River Basin Management Plans (RBMPs) are due to be published in 2022, which may bring about changes in the baseline status and objectives for waterbodies. Where necessary, changes will need to be accounted for in updates to the WFD assessments.

1.5 Assumptions and limitations

Due to the level design information at this stage the WFD assessment has the following limitations and assumptions:

- The ACWG approach uses WFD 2015 data, as it is the current officially reported baseline in the Anglian region RBMP Cycle 2 (2015-2021)⁴. The RBMPs are anticipated to be updated in 2022, and 2019 WFD baseline data released in late 2020 would then become the new baseline. For consistency, the 2015 data has been used at Gate 1 and 2; but it is acknowledged that this will need to be updated to the 2019 status, once the RBMPs are published (proposed for gate three).
- Where there is no data available for the WFD element, this has not been assessed as part
 of the Level 2 WFD assessment.
- Decommissioning of the reservoir and transfers have not been assessed as part of the gate two assessment.
- It is assumed the Water Treatment Works (WTW) will only treat water from the reservoir and will not discharge to a local watercourse.
- It is assumed bund will contain a core of low permeability material, which will limit connection between the reservoir and local watercourses, excluding where formal discharges maybe present.
- If dewatering is required, a permit will need to be obtained from the EA. It is assumed the permit will cover water quality to ensure it is suitable to discharges into the watercourses.
- The geographical extent of the WFD assessment has been limited to waterbodies where construction activities are taking place.
- This assessment only takes into account the waterbody where the abstraction is located
 on the River Trent and River Witham. Consideration of the impacts on waterbodies
 downstream and the associated impacts of the abstraction will be included during the next
 stages of project development, following further investigation.
- This option includes a transfer of water between the River Trent and River Witham. Water
 is discharged into the River Witham, and then abstracted further downstream from the
 River Witham to supply the SLR. This assessment considers all the River Witham
 waterbodies between the abstraction and discharge locations.
- At the time of writing, the emergency draw down design has not been completed as multiple options are under consideration. The emergency draw down has therefore been

⁴ Environment Agency (2016) Anglian RBMP. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718327/Anglian_RBD_Part_1_riv_er_basin_management_plan.pdf

excluded from this WFD assessment. It is expected that this will be included within the WFD assessment at the gate three once the design has been finalised.

2 Scheme Description

2.1 Scheme overview

The SLR scheme includes the development of a new embanked raw water reservoir for water storage for public water supply. It also comprises abstractions from the River Witham and River Trent, raw water transfers, treatment works, and distribution into supply.

Key scheme parameters include:

| • | River Trent maximum abstraction and transfer flow to River Witham: (Megalitres per day) | 300MI/d |
|---|---|---------|
| • | River Witham maximum abstraction and transfer flow to reservoir: | 400MI/d |
| • | Reservoir total capacity: | 55MCM • |
| | Reservoir usable volume: | 50MCM |
| • | Treatment distribution flow ⁵ : | 150MI/d |

2.1.1 Reservoir overview

The proposed reservoir site is shown in Figure 2.1, and is located approximately 7km southeast of the town of Sleaford, between the settlements of Swaton, Scredington and Helpringham in the North Kesteven District Council area. South Kesteven District Council's administrative boundary is approximately 100m south of the polygon, south of the A52 Holland Road. The Peterborough to Lincoln railway line runs along the north-eastern boundary with the North Beck watercourse situated just north of the site boundary.

An indicative concept plan has been developed for the scheme. This indicative concept has been established to provide reference for cost and carbon estimation in gate two. The summary provisional details are provided below, but much work is still required to develop the scheme and the final details will develop accordingly.

The provisional reservoir parameters are as follows:

- At its greatest dimensions the reservoir is 2.6km wide and 3.2km long to the embankment toe.
- The embankment crest is estimated at 26m AOD making the embankment an average of 14m above the existing ground level at the toe, a maximum of 15.1m and a minimum of 3.7m above existing ground levels.

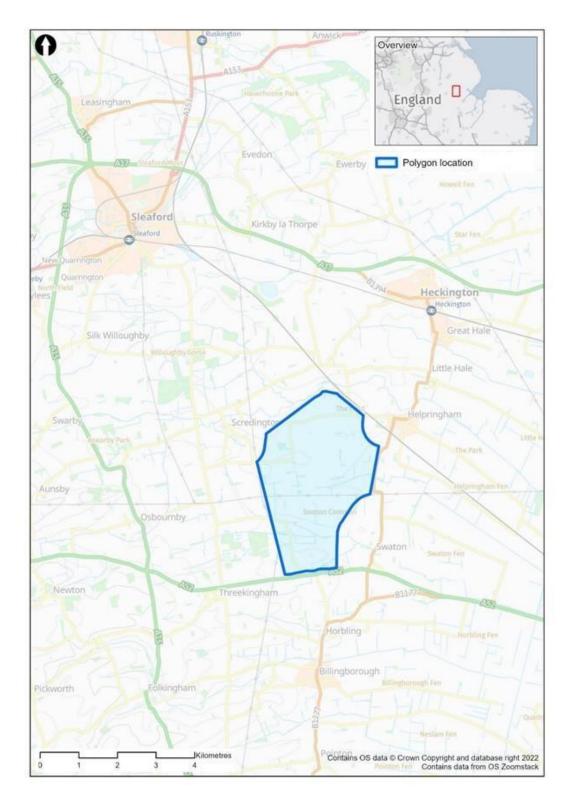
⁵ The proposed capacity of the water treatment works and transfer pipelines has been updated since this assessment was completed. The figures quoted in the gate two report include a scheme deployable output of 166Ml/d and works capacity up to 180Ml/d. These changes are not anticipated to have any material impact on the completed assessments.

 The total perimeter length of the crest is approximately 8.5km and the estimated reservoir surface area is 4.8km².

The reservoir would include key infrastructure necessary for its safe operation, including intake and outtake structures; drawdown facilities; a spillway and water sampling facilities. The reservoir will also be expected to provide benefits beyond public water supply. Opportunities to incorporate facilities to enable recreation (such as a visitor centre and parking), infrastructure to improve health and wellbeing (such as multi-use footpaths, quiet areas and leisure opportunities) and careful design to enhance and encourage biodiversity are planned and will be developed further, with the features that would deliver these wider benefits being subject to further assessment and consultation. Landscaping would be carefully designed surrounding the

reservoir to minimise the visual impact of the reservoir whilst ensuring it sits within the existing landscape and delivers wider recreational and biodiversity benefits.

Figure 2.1: Site context map



2.1.2 Raw water abstraction and transfers

It is proposed that water will be abstracted from the River Witham. The abstraction location has currently been assumed, for indicative purposes, to be at an intake between Chapel Hill and Langrick Bridge. The precise abstraction location will be identified following further detailed work

(including stakeholder engagement) for gate three. The current design includes the transfer of water into the reservoir by about 18km of 1600mm (millimetres) diameter steel pipeline.

However, the precise abstraction location will be identified following further detailed work (including stakeholder engagement) for gate three. The proposed abstraction rate from the River Witham is up to 400Ml/d when flows allow. This is subject to further assessment undertaken in collaboration with the Environment Agency (EA) to develop an abstraction rate which is licensable. The associated abstraction licence is expected to stipulate a minimum flow and minimum water level requirement at the point of abstraction below which it would not be possible to abstract. Abstraction to fill the reservoir would only be possible during high flow periods.

It is proposed that flows in the River Witham would be supported via a transfer from the River Trent. Up to 300Ml/d would be abstracted from the River Trent, with an intake currently assumed for indicative purposes to be located near Newark-on-Trent (although, as with the River Witham abstraction, the precise abstraction location will be identified following further detailed work for gate three) and transferred by about 10km of 1400mm diameter steel pipeline to the River Witham near Claypole. Without mitigation, there is a risk of INNS transferring between catchments (see EAR).

The current design includes the transfer of water into the reservoir by about 18km of 1600mm (millimetres) diameter steel pipeline. The potential for the raw water transfer to the reservoir from the River Witham into the South Forty Foot Drain (SFFD) and then into the reservoir, using open channel, to deliver additional benefits has been identified as an opportunity. This opportunity is being investigated further and will be confirmed during the next stage of project development.

Further work is planned for the next stage to confirm the locations of the abstraction points and routes for the transfers. This will involve landowner engagement, environmental surveys, and preliminary ground investigations. The information provided in this report and accompanying appendices are assumptions based on indicative locations only at this stage. The indicative transfer routes for are shown in Figure 2.2.

The abstraction facilities are expected to comprise an intake structure, a transfer pumping station (TPS) and pipeline.

2.1.3 Water treatment and potable transfers

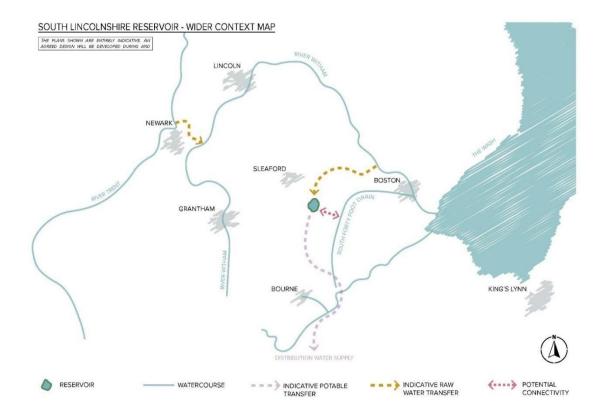
Stored water will subsequently be abstracted from the reservoir and treated to a potable quality. It is proposed that a WTW is located on land adjacent to the reservoir with a peak throughput capacity of 180Ml/d.

It is proposed that the treated water will be transferred by an approximate 37km 1100mm diameter steel pipeline into the potable supply network by an existing Anglian Water Service Reservoir. The reservoir is to supply over 500,000 homes in Lincolnshire and the south-west of the Anglian region.

Further work is planned for the next stage to confirm the routes for the transfers involving landowner engagement, environmental surveys, and preliminary ground investigations. The information provided in this report and accompanying appendices are assumptions based on indicative locations only at this stage.

See Figure 2.2 for an illustration of indicative proposed transfer corridor locations.

Figure 2.2 Proposed transfer corridors



2.1.4 Summary of operation and use

Development and operation of the reservoir will be subject to the Reservoirs Act 1975 (as amended by the Floods and Water Management Act 2010). The embankments and associated water retaining elements of the reservoir will need to be maintained and supervised in accordance with the Act to maintain public safety.

Provision of emergency drawdown must be designed in accordance with the Reservoirs Act. The proposed solution at this stage is to discharge to the SFFD, but this is to be further modelled and confirmed as part of the next stage of development. Although the risk of needing to fully drawdown the reservoir is very low, there is a need for regular testing and maintenance to confirm functionality. This will involve the opening and testing of relevant valves and gates. Test flows are envisaged to be held in a pond to avoid disruption and to enable water to be returned to the reservoir.

The operation and maintenance of the water treatment works and the distribution water supply system inclusive of distribution pump stations are expected to be in constant regular use according to water supply demand. The water supply components will need regular inspections and maintenance activities in accordance with the requirements of the respectively installed equipment.

2.1.5 Associated infrastructure and features

It is proposed that there will be a need for associated infrastructure and other features such as environmental mitigation to minimise the impacts of the reservoir, as well as enhancement opportunities. The location and design of the additional infrastructure has not been established and will therefore need to be confirmed at the next phase of scheme development.

3 Changes since gate one

A site selection process has been undertaken to determine the proposed site for the SLR SRO option, which has been put forward to the RAPID gate two submission. This process has identified and assessed potential site locations against the following criteria: planning, community, environmental, economic and technical criteria (constraints and opportunities). The iterative approach was aligned with relevant legislation and national and local planning policy, including the draft National Policy Statement for Water Resources Infrastructure. Local planning authorities and statutory stakeholders have been consulted on the methodology, and local stakeholders have been engaged through the South Lincolnshire Water Partnership.

Following completion of the gate one WFD assessment in 2021, the proposed reservoir location has been selected, and further design development work has continued. This has allowed the list of waterbodies requiring further WFD assessment to be refined for gate two.

Reservoir and transfers

- South Beck GB105030056520
- Swaton Drains GB105030056515

Transfers only

- Brook Drain (including Marholm Brook) GB105031050595
- The Fleet Upper Catchment (tributary of Trent) GB104028053430
- Black Sluice IDB draining to the South Forty Foot Drain GB205030051515
- Ousemere Lode GB105030056490
- Slough Dyke Catchment (tributary of Trent) GB104028053111
- Billingborough Lode GB105030056480
- Pointon Lode GB105030051555
- Old Beck GB105030051540
- Glen GB105031050720
- Vernatt's Drain GB205031050705
- Welland confluence of Gwash to confluence of Greatford Cut GB105031050600
- Welland confluence of Greatford Cut to tidal GB205031050685
- Maxey Cut GB205031050595
- Lower Trent Erewash (Secondary Combined) groundwater body GB40402G990300
- Witham Lias groundwater body GB40502G401400
- Cornbrash groundwater body GB40502G445000

Abstraction only

Trent from Soar to The Beck - GB104028053110

Discharge only

• Witham – conf Cringle Bk to conf Brant- GB105030056780

Abstraction and transfer of discharged water from the abstraction at the River Trent

Lower Witham – conf Bain to Grand Sluice - GB205030062426

Transfer of discharged water from the abstraction at the River Trent

- Witham conf Brant to conf Catchwater Drain GB105030062370
- Witham conf Catchwater Drain to conf Bain GB205030062425

4 Supporting Technical Assessment

This section summarises supporting technical assessments that have influenced the gate two assessment. Ongoing workstreams, baseline data collection and analysis during gate two include, but not limited to, selection of the proposed site (as stated in Section 3), and hydraulic and hydro-ecology survey, modelling and monitoring.

4.1 Gate one assessment

Mott MacDonald carried out a Level 1 and Level 2 WFD Assessment for gate one in 2021, which assessed the risk of deterioration or impeding achieving 'Good status' to a WFD waterbody based on various SLR options that were outlined in the optioneering phase. The findings indicated that there were precautionary WFD compliance risks associated with the abstractions and intakes.

4.2 Preferred site selection

In June 2022, strategic assessments were carried out on the short list of four location options to help identify the proposed site. These assessments considered only the reservoir footprints and were based on the preliminary design information available at the time. The assessment for the proposed site has been used as the basis for this latest proposed site assessment.

4.3 Level 1 WFD assessment for transfers

The transfers considered consists of:

- Construction of a pipeline, approximately 10km in length to transfer water from River Trent to River Witham
- Construction of a pipeline, approximately 18km in length, to transfer water from River Witham to South Lincolnshire reservoir
- Construction of a pipeline, approximately 37km in length to transfer water from South Lincolnshire reservoir to Water Treatment Works in Peterborough

The following assumptions were made in the assessment of this transfer route:

- Operation and maintenance of the transfers were omitted from this assessment as the design and operation of the transfers is yet to be determined. An assessment of which will be undertaken at a later design stage.
- Regarding the construction methods of the transfers, trenchless construction methods will be employed when crossing main rivers, watercourses, and watercourse links. The remaining lengths will be installed using trenching and laying methods.
- If the watercourse needs to be temporarily diverted, appropriate measures will be in put in place to protect ecology and watercourse will be returned to its natural state.
- It is assumed that appropriate precautions will be taken when working in the channels of
 watercourses, to appropriately manage flood risk and the potential for deposition of silt or
 release of other forms of suspended material or pollution within the water column.

Based on these assumptions made, the transfers do not have the potential to cause deterioration to WFD status within waterbodies that interface with the transfer network. Therefore, none of the waterbody catchments required a Level 2 assessment, where the transfer is the sole design element (see Section 5.1).

4.4 Hydro-ecology

Mott MacDonald carried out an informal Stage 2 Habitat Regulations Assessment (HRA)⁶ in June 2022 and concluded that no residual effects remain on designated sites for the construction phase of the scheme at The Wash SPA/Ramsar Site and The Wash and Norfolk Coast SAC, assuming that all proposed mitigation is implemented. However, adverse effects for the operational phase cannot be ruled out, as the potential adverse effects of increased sedimentation and changes in water levels and flows and are currently unknown.

In June 2022, Mott MacDonald carried out a Hydro-ecology study to consider implications on aquatic habitats and species. This study concluded the following:

- The abstractions would only result in significant flow reduction during high-discharge periods in winter. Summer flows during high-discharge periods would not be significantly affected. On the basis of current modelled scenarios, water transfer from the River Trent would result in dramatic flow increases in the River Trent, throughout the year, with proportionately greater impact in the summer. The increase would be most pronounced at the point of transfer into the River Witham, and the effect would be reduced with distance downstream.
- Changes in flow because of the scheme have the potential to impact water depths and velocities at barriers along the watercourse, ultimately rendering barriers less passable for all of the fish species identified in this study.
- For aquatic communities, the impacts are pronounced at Claypole and gradually reducing
 in magnitude with distance from the discharge point. There is potential for a reduced
 impact on fish species further downstream of the discharge point as the results from the
 hydrological analysis suggest the increase in flow will be significantly reduced in
 comparison to the baseline.

4.5 Water quality modelling

Mott MacDonald conducted Soil and Water Assessment Tool (SWAT) modelling of phosphorus. This study concluded that:

- Transferring water from the River Trent to the River Witham to support flow and abstraction in the River Witham results in higher orthophosphate concentrations at the River Trent (Langrick Bridge) abstraction point.
- Transferring water from the River Trent to the River Witham during the summer results in a greater increase in phosphorus load at River Trent (Langrick Bridge) than transferring at the same rate during autumn and winter. This is a result of reduced dilution of phosphorus, mostly from point sources during the summer when flows are lower in both the River Trent and River Witham.

⁶ Mott MacDonald, 2022. SLR Reservoir Informal Habitats Regulations Assessment (HRA), June 2022.

5 WFD Assessment

5.1 Level 1 assessment

Table 5.1 provides the colour-coding matrix applied to identify if waterbodies are screened in or out of further assessment. Further information on WFD classification and the approach adopted can be found in ACWG, WFD: Consistent framework for undertaking no deterioration assessments, Nov 2020⁷.

Table 5.1: Level 1 WFD screening classification

Green - Passes Level 1 WFD, no further assessment (score 1 or less)

Amber – Level 1 WFD score greater than 1, screened in for Level 2

A WFD assessment has been produced for the scheme. Table 5.2 provides a summary of the gate two Level 1 WFD assessment and provides context relating to the waterbodies affected. Of the WFD waterbodies that have been identified, full details are included in Appendix A.

ACWG (2020). Water Framework Directive: Consistent framework for undertaking no deterioration assessments, November 2020.

Table 5.2: Level 1 WFD assessment summary (waterbody screening)

| Waterbody ID | Maximum impact score Comment / screening outcome | | |
|---|--|--|--|
| GB105030056515 - Swaton Drains | 3 | Headwaters of the main watercourse is located within the reservoir footprint, leading to the loss of a significant percentage of the catchment and several open channels. A new transfer will be located within this catchment. A new WTW will be located within this catchment. | |
| GB105030056520 - South Beck | 3 | Reservoir located in this waterbody, leading to the loss of catchment and several open channels. Main watercourse located downstream of the reservoir. A new transfer will be located within this catchment. | |
| GB104028053110 – Trent from Soar to Beck | 3 | A new surface abstraction, intake structure and pipeline will be located within this catchment, leading to reductions in flow in this water course | |
| GB105030056780 – Witham – conf Cringle Bk to conf Brant | 3 | A new discharge and transfer will be located within this catchment, leading to the potential for changes in flow and water quality. | |
| GB104028053111 – Slough Dyke Catchment (trib of Trent) | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |
| GB105030062370- Witham conf Brant to conf Catchwater Drain | 2 | Discharge in upstream catchment, leading to the potential for changes in flow and water quality. | |
| GB205030062425 – Witham – cont Catchwater Drain to conf Bain | 2 | Discharge in upstream catchment, leading to the potential for changes in flow and water quality. | |
| GB205030062426 - Lower Witham - cont Bain to Grand Sluice | 3 | Discharge in upstream catchment, leading to the potential for changes in flow and water quality. A new surface water abstraction will also be located within this catchment | |
| GB104028053430 – The Fleet Upper Catchment (trib of Trent) | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |

| GB205030051515 – Black Sluice IDB draining to the South Forty Foot Drain | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. |
|---|---|---|
| GB105030056490 – Ousemere Lode 1 A new transfer will be located within this catchment. No significant impacts anticipated. | | A new transfer will be located within this catchment. No significant impacts anticipated. |
| GB105030056480 – Billingborough Lode 1 A new transfer will be located within this catchment. No significant impacts anti | | A new transfer will be located within this catchment. No significant impacts anticipated. |

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| Waterbody ID | Maximum impact score Comment / screening outcome | | |
|---|--|---|--|
| GB105030051555 – Pointon Lode | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |
| GB105030051540 – Old Beck | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |
| GB105031050720 - Glen | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |
| GB205031050705 – Vernatt's Drain | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |
| GB105031050600 - Welland - conf Greatford Cut | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |
| GB205031050595 – Maxey Cut | 1 | A new intake structure and transfer will be located within this catchment. No significant impacts anticipated. | |
| GB105031050595 – Brook Drain (including Marholm Brook) | 1 | A new transfer and storage reservoir will be located within this catchment. No significant impacts anticipated. | |
| GB205031050685 – Welland – conf Greatford Cut to tidal | 1 | A new transfer will be located within this catchment. No significant impacts anticipated. | |
| GB40502G445000 – Cornbrash | 1 | A new transfer will be located within this groundwater body catchment. No significant impacts anticipated. | |

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| GB40402G990300 – Lower Trent Erewash – Secondary Combined | 1 | A new intake structure and transfer will be located within this groundwater body catchment. No significant impacts anticipated. |
|---|---|---|
| GB40502G401400 – Witham Lias | 1 | A new transfer will be located within this groundwater body catchment. No significant impacts anticipated. |

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Level 1 assessment identified 24 waterbodies which could potentially be affected by the scheme. Following the Level 1 assessment, seven of these waterbodies were identified as requiring further assessment, due to the potential effects on the WFD waterbodies.

The following WFD surface water bodies were assessed at Level 2:

- GB105030056515 Swaton Drains
- GB105030056520 South Beck
- GB104028053110 Trent from Soar to Beck
- GB105030056780 Witham conf Cringle Bk to conf Brant
- GB105030062370 Witham conf Brant to conf Catchwater Drain
- GB205030062425 Witham conf Catchwater Drain to conf Bain
- GB205030062426 Lower Witham conf Bain to Grand Sluice

5.2 Level 2 WFD Assessment

5.2.1 Assessment methodology

The second stage of the WFD assessment has been completed for the SLR scheme for waterbodies that were screened in at Level 1. Further information on WFD classification and the approach adopted can be found in *ACWG*, *WFD*: Consistent framework for undertaking no deterioration assessments, Nov 2020. This assessment will be updated as design progresses and a full WFD assessment will be completed for consenting.

Table 5.3 provides a summary of WFD confidence levels used to inform the Level 2 assessment.

Table 5.3: Explanation of WFD confidence levels, based on ACWG methodology

| Confidence Level | Description | | |
|---------------------|---|--|--|
| Low | Gate one and two - Limited data and evidence available, based mainly or completely on expert judgement with many assumptions. Preliminary design information only, detailed information on location/routes, construction methods etc not yet available. | | |
| Medium | Gate two - Some data and evidence available, based partially on expert judgement with some assumptions. Design progressed but some assumptions made on construction methods etc. | | |
| High | Gate three and four - Lots of good data and evidence are available, minimal assumptions. Design advanced minimal assumptions needed. | | |

Table 5.4 provides a description of the risk of deterioration between status classes, compromising waterbody objectives, and assisting future attainment of waterbody objectives. Each WFD supporting element has been assessed against the potential risk as a result of the activity occurring.

Table 5.4: Description of WFD risk levels/outcomes

| | Deterioration between status classes objectives | Compromises waterbody waterbody objectives | Assists attainment of |
|--|--|--|---|
| | Yes = activities have a clear potential to cause deterioration of WFD status | Yes = activities clearly conflict with delivery of future improvements in WFD status | No = activities unlikely to contribute to achieving 'Good' status or potential |
| Possible = activities could cause deterioration of WFD status but unclear extent/level of effect | | Possible = activities conflict with future improvements in WFD status but unclear extent/level of effect | Possible = activities could contribute to achieving 'Good' status or potential but unclear extent/level of effect |

No = activities unlikely to pose any risk of deterioration in status

No = activities unlikely to pose any risk of deterioration in status

Yes = activities could directly contribute to achieving 'Good' status or potential

Uncertain = insufficient information or evidence to assess

Source: ACWG, 2020.

5.2.2 Standard mitigation and good practice

Construction activities will be managed by good practice construction measures to be included within an CEMP for the scheme in accordance with Construction Industry Research and Information Association (CIRIA) Guidelines. Guidance on good practice in relation to pollution prevention and water management is set out in CIRIA's 'Environmental good practice on site'⁸, CIRIA's 'Control of water pollution from linear construction projects; Technical Guidance'⁹ and the withdrawn EA's 'Protect groundwater and prevent groundwater pollution'¹⁰, Pollution Prevention Guidelines (PPG)5 'Works and maintenance in or near water', PPG6 'Working at Construction and Demolition Sites', PPG7 'The safe operation of refuelling facilities', and PPG13 'Vehicle washing and cleaning'¹¹. Whilst the EA PPGs were formally withdrawn in 2015, the information still provides useful guidance. It is assumed the reservoir will include adequate drainage to accommodate potential changes in surface water run-off and water control.

5.2.3 Summary of results/outcomes

The following WFD surface water bodies were assessed at Level 2:

- GB105030056515 Swaton Drains
- GB105030056520 South Beck
- GB104028053110 Trent from Soar to Beck
- GB105030056780 Witham conf Cringle Bk to conf Brant
- GB105030062370 Witham conf Brant to conf Catchwater Drain
- GB205030062425 Witham conf Catchwater Drain to conf Bain
- GB205030062426 Lower Witham conf Bain to Grand Sluice

The Level 2 WFD assessment for the two waterbodies which the reservoir will be located in: Swaton Drains and South Beck, identified deterioration risks to hydromorphological supporting elements, in addition to geomorphological conditions (not as assessed as part of the WFD). These are primarily due to potential risks associated with the loss of open watercourses, which could potentially be mitigated by the realignment of some watercourses and/or alternative

The assessment for the remaining five waterbodies identified possible deterioration risks to flow, water quality and biological status elements due to the abstractions and discharges. However,

⁸ Audus, Charles and Evans (2010) Environmental Good Practice on Site (Third Edition) (C692).

⁹ Murnane, Heap and Swain (2006) Control of water pollution from linear construction projects; Technical Guidance. ¹⁰ Environment Agency (2017) Protect groundwater and precent groundwater pollution [online] available at: https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution (Last accessed March 2022).

¹¹ The Environment Agency PPGs were formally withdrawn on 17 December 2015; however, they nonetheless provide clear and useful good practice advice. The archived PPGs are available at: https://www.environmentagency.gov.uk/business/topics/pollution/39083.aspx.

mitigation (e.g., in-channel improvements). However, further assessment and mitigation design would be required to confirm, and the assessment remains as at risk of deterioration until this work is complete.

further assessment would be required to confirm the impact and to identify appropriate WFD mitigation.

A summary of the Level 2 WFD assessment is included in Table 5.5. Detailed outputs are presented in Appendix B.

Impacts on downstream waterbodies, including the Wash and Humber estuaries have not been considered at this stage. They will be considered during the next stages of project development.

5.2.3.1 South Beck

The following elements are located within this catchment:

- Construction and operation of a new reservoir
- Construction and operation of new SLR treatment works to supply connection point flow conveyance

A potential minor localised risk (no risk of deterioration) to the South Beck was identified from the loss of open watercourse and loss of up to 4% of open watercourse within the catchment due to the presence of the reservoir. This loss of catchment and watercourses could impact on habitat, flow and hydromorphology within this waterbody catchment.

At this stage, it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse. Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

5.2.3.2 Swaton Drains

The following elements are located within this catchment:

- Construction and operation of a new reservoir
- Construction and operation of a new pipeline
- Construction and operation of a new Water Treatment Works (WTW), set back from the watercourse
- Construction and operation of a new small storage reservoir (set back from the watercourse)

A potential major adverse risk (risk of deterioration) to the Swaton Drains was identified, as a result of the reservoir footprint. This would result in loss of up to 2.5km of open channel, along with 28% of the catchment. The loss of catchment and open channel would lead to major adverse effects (risk of deterioration) on habitat, flow, hydromorphology and mitigation measures assessment in this waterbody. Mitigation could include realigning and diverting any substantial watercourses. Similarly, river restoration (in-channel and/or floodplain reconnection and riparian improvements/NFM) could also be considered to offset loss of habitat and impacts on hydromorphology. Consideration could be given to providing compensatory flows from the reservoir to Swaton Drains to support flows, though implications on water quality and INNS would need to be considered. However, until further assessment and design has included suitable mitigation a risk of deterioration remains.

At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to a watercourse. Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

The new WTW will be set back from the watercourse, therefore the construction impacts are expected to be negligible.

5.2.3.3 Trent from Soar to Beck

The following elements are located within this catchment:

- Construction and operation of a new surface water abstraction
- Construction and operation of a new river intake structure
- Construction and operation of a new pipeline

An amber adverse risk (potential risk of deterioration) to the Trent from Soar to Beck was identified as a result of the new surface water abstraction. Abstraction rates are expected to be <10% of the total volume of the Trent catchment and the change in flow and velocity has the potential to impact biological elements. Further investigation is required to determine the full extent of the impacts. An amber adverse risk (potential risk of deterioration) was also identified due to potential for changes in water quality due to the surface water abstraction. The abstraction could result in a change in the physio-chemical conditions due to reduced dilution downstream.

At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse. Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

5.2.3.4 Witham – conf Cringle Bk to conf Brant

The following elements are located within this catchment:

- Construction and operation of a new discharge and outfall structure
- Construction and operation of a new inter river flow conveyance, Trent to Witham transfer

A potential major adverse risk (risk of deterioration) to the Witham – conf Cringle Bk to conf Brant was identified as a result of the discharge from the Trent from Soar to Beck. A high-level water quality assessment of the indicative transfer was conducted, it concludes there is an expected 69% increase in ammonia concentrations. The RBMP Cycle 2 status of ammonia is currently 'High'. The expected increase in ammonia concentration has the potential to lead to a major adverse risk (risk of deterioration) on the water quality. There is an expected increase 17% in phosphate concentrations, with a Cycle 2 classification of 'High' and 'Moderate'. This is expected to have an amber adverse risk (potential risk of deterioration). It is recommended additional water quality modelling analysis should be undertaken to assist in determining the appropriate mitigation measures.

An amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge into this waterbody will lead to changes in water velocity and levels, which could impact on biological status elements. It is recommended hydroecology analysis is carried out to better understand the impact of the discharge on flow velocity and levels, and therefore on biological status elements.

The transfer via the River Witham will only be operated during wetter periods and no impact is anticipated on dry/drought conditions within the river. At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse.

Construction methods will involve trenchless activities and therefore the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

The INNS treatment planned on the abstraction from the River Trent will ensure there is no risk for transfer of INNS into the River Witham from the River Trent.

5.2.3.5 Witham - conf Brant to conf Catchwater Drain The

following elements are located within this catchment:

Transfer of discharged water from the River Trent abstraction

A potential major adverse risk (risk of deterioration) to the Witham – conf Brant to conf Catchwater Drain was identified as a result of changes in water quality due to the discharge from the River Trent into the upstream River Witham waterbody (Witham – conf Cringle Bk to conf Brant). A high- level water quality assessment, concludes there is the potential for a 46% increase in phosphate in the Witham - conf Brant to conf Catchwater Drain catchment, due to the upstream discharge from the River Trent. On a precautionary basis this is assessed as a major adverse effect (risk of deterioration). Similarly, the following other potential changes in water quality have been assessed:

- Potential increase in ammonia concentration (7%) which is assessed as an amber adverse effect (potential risk of deterioration)
- Potential 4% increase in pH, assessed as an amber adverse effect (potential risk of deterioration)
- Potential 1% increase in temperature, assessed as a negligible effect
- Potential decrease of 2% in Dissolved Oxygen assessed as a negligible effect

Further investigation is required to determine the actually likely changes in water quality and the potential impact of these changes on biological status elements.

Finally, an amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge into this waterbody will lead to changes in water velocity and levels, which could impact on biological status elements. It is recommended hydroecological analysis is carried out to better understand the impact of the discharge on flow velocity and levels, and therefore on biological status elements. The transfer via the River Witham will only be operated during wetter periods and no impact is anticipated on dry/drought conditions within the river.

5.2.3.6 Witham - conf Catchwater Drain to conf Bain The

following elements are located within this catchment:

Transfer of discharged water down River Witham from the River Trent abstraction

A potential major adverse risk (risk of deterioration) to the Witham - conf Catchwater Drain to conf Bain was identified as a result of changes in water quality due to the discharge from the River Trent into the upstream River Witham waterbody (Witham – conf Cringle Bk to conf Brant). A high- level water quality assessment, concludes there is the potential for a 46% increase in phosphate in the Witham - conf Catchwater Drain to conf Bain catchment, due to the upstream discharge from the River Trent. On a precautionary basis this is assessed as a major adverse effect (risk of deterioration). Similarly, the following other potential changes in water quality have been assessed:

- Potential increase in ammonia concentration (7%) which is assessed as an amber adverse effect (potential risk of deterioration)
- Potential 4% increase in pH, assessed as an amber adverse effect (potential risk of deterioration)
- Potential 1% increase in temperature, assessed as a negligible effect
- Potential decrease of 2% in Dissolved Oxygen assessed as a negligible effect

Further investigation is required to determine the actually likely changes in water quality and the potential impact of these changes on biological status elements.

Finally, an amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge into this waterbody will lead to changes in water velocity and levels, which could impact on biological status elements. It is recommended hydroecological analysis is carried out to better understand the impact of the discharge on flow velocity and levels, and therefore on biological status elements. The transfer via the River Witham will only be operated during wetter periods and no impact is anticipated on dry/drought conditions within the river.

5.2.3.7 Lower Witham - conf Bain to Grand Sluice

The following elements are located within this catchment:

- Transfer of discharged water down River Witham from the River Trent abstraction
- Construction and operation of a new surface water abstraction on the River Witham
- Construction and operation of a new river intake structure
- Construction and operation of a new River Witham to SLR flow conveyance pipeline

A potential major adverse risk (risk of deterioration) to the Lower Witham - conf Bain to Grand Sluice was identified as a result of changes in water quality due to the discharge from the River Trent into the upstream River Witham waterbody (Witham – conf Cringle Bk to conf Brant). A high- level water quality assessment, concludes there is the potential for a 46% increase in phosphate in the Lower Witham - conf Bain to Grand Sluice catchment, due to the upstream discharge from the River Trent. On a precautionary basis this is assessed as a major adverse effect (risk of deterioration). Similarly, the following other potential changes in water quality have been assessed:

- Potential increase in ammonia concentration (7%) which is assessed as an amber adverse effect (potential risk of deterioration)
- Potential 4% increase in pH, assessed as an amber adverse effect (potential risk of deterioration)
- Potential 1% increase in temperature, assessed as a negligible effect
- Potential decrease of 2% in dissolved oxygen assessed as a negligible effect

Further investigation is required to determine the actually likely changes in water quality and the potential impact of these changes on biological status elements.

An amber adverse effect (potential risk of deterioration) was also identified for biological status elements due to change in flow velocity and volume. The discharge and subsequent abstraction at this waterbody will lead to changes in water velocity and level, which could impact on biological status elements. It is recommended hydroecological analysis is carried out to better understand the impact of the discharge and abstraction on flow velocity and levels, and therefore on biological status elements.

At this stage it is assumed the construction of the pipeline will not involve in-channel modifications to the watercourse. Construction methods will involve trenchless activities. Therefore, the impact on the watercourse catchment as a result of the transfer is expected to be negligible.

5.2.4 Summary

Table 5.5 provides a summary of all the WFD waterbodies screened in at Level 1 and 2 of the WFD Assessment.

Table 5.5: Summary of WFD waterbodies affected

| Waterbody ID | Maximum Impa Score (Level 1) | ct Maximum Impact I Score (Level 2) | Deterioration between status classes | Impediments to GES/GEP | Compromises waterbody objectives | Assists attainment of water body objectives |
|--|---------------------------------|--|--------------------------------------|------------------------|----------------------------------|---|
| GB105030056515 - Swaton Drains | 3 | 3 | Yes | Yes | Yes | No |
| GB105030056520 - South Beck | 3 | 1 | No | No | No | No |
| GB104028053110 – Trent from Soar to Beck | 3 | 2 | No | No | No | No |
| GB105030056780 – Witham – conf Cringle Bk to conf Brant | 3 | 3 | Yes | Yes | Yes | No |
| GB105030062370 - Witham conf Brant to conf Catchwater Drain | 3 | 3 | Yes | Yes | Yes | No |
| GB205030062425 – Witham – conf Catchwater Drain to conf Bain | 3 | 3 | Yes | Yes | Yes | No |
| GB205030062426 – Lower Witham – conf Bain to Grand Sluice | 3 | 3 | Yes | Yes | Yes | No |
| GB104028053111 - Slough Dyke Catchment (trib of Trent) | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB104028053430 - The Fleet Upper Catchment (trib of Trent) | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB205030051515 - Black Sluice IDB draining to the South Forty Foot Drain | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB105030056490 - Ousemere Lode | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |

| GB105030056480-Billingborough Lode | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
|---------------------------------------|---|------------------------------------|-----|-----|-----|-----|
| GB105030051555 - Pointon Lode | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |

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| GB105030051540 -Old BeckGB105030051540Old Beck | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
|--|---|------------------------------------|-----|-----|-----|-----|
| GB105031050720 - Glen | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB205031050705 - Vernatt's Drain | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB105031050600 - Welland - conf Gwash to conf Greatford Cut | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB205031050595 - Maxey Cut | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB105031050595 - Brook Drain (including Marholm Brook) | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB205031050685 - Welland - conf Greatford Cut to tidal | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB40502G445000 - Cornbrash | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
| GB40402G990300 - Lower Trent Erewash - Secondary Combined | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |

| GB40502G401400 - Witham Lias | 1 | Level 2 assessment not required | N/A | N/A | N/A | N/A |
|------------------------------|---|---------------------------------|-----|-----|-----|-----|
| | | ' | | | | |

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5.3 Risk of deterioration

A major adverse risk (risk of deterioration) to the Swaton Drains (ID: GB105030056515) has been identified. Within the reservoir footprint over 2.5km of open channel would be lost, along with 28% of the catchment. The loss of open channel would impact on habitat, flow and hydromorphology in this waterbody. Mitigation would include provision of new open water channels and providing compensatory flows from the reservoir to Swaton Drains. However, implications on water quality and INNS would to be considered. Similarly, river restoration (inchannel and/or floodplain reconnection and riparian improvements/NFM) could also be considered to offset loss of habitat and impacts on hydromorphology.

An amber adverse risk (potential risk of deterioration) to the Trent from Soar to Beck was identified as a result of the new surface water abstraction. Abstraction rates are expected to be <10% of the total volume of the Trent catchment and the change in flow and velocity has the potential to impact biological elements. Further investigation is required to determine the full extent of the impacts. An amber adverse risk (potential risk of deterioration) was also identified due to potential for changes in water quality due to the surface water abstraction. The abstraction could result in a change in the physico-chemical conditions due to reduced dilution downstream.

A major adverse risk (risk of deterioration) to the Witham – conf Cringle Bk to conf Brant (ID: GB105030056780) has been identified as a result of the discharge from the Trent from Soar to Beck. A high-level water quality assessment of the indicative transfer was conducted, it concludes there is an expected 69% increase in ammonia. As of the RBMP Cycle 2 the status of ammonia is 'High', this increase in ammonia has the potential to cause a significant effect on the water quality. In combination with an increase in the other physico-chemicals, this has the potential to decrease the chemical status from 'Moderate' to 'Poor'. It is recommended additional water quality modelling analysis should be undertaken to assist in determining proportionate mitigation measures.

Major adverse risk (risk of deterioration) to the Witham – conf Brant to conf Catchwater Drain (ID: GB105030062370) and the Witham - conf Catchwater Drain to conf Bain (ID: GB205030062425) have been identified as a result of the discharge from the Witham – conf Cringle Bk to conf Brant (ID: GB105030056780). A high-level water quality assessment concludes an expected 46% increase in phosphate by the time it reaches both catchments. Within the catchments, phosphate levels are expected to be lower. However, further investigation is required to determine the predicted percentage change. It is recommended additional water quality modelling analysis should be undertaken to assist in determining the proportionate mitigation measures.

If this scheme is taken forward, it is possible that an exemption would need to be sought under Regulation 19 of the Water Environment (Water Framework Directive) (England & Wales) Regulations 2017 (WFD Regulations 2017) in respect of potential deterioration in status of one or more waterbodies. Further investigation is required to fully quantify the impacts and identify possible mitigation.

5.4 In-combination effects

An initial in-combination effects assessment has been undertaken as part of the gate two WFD report. The SLR SRO is being considered as a major supply-side option in the Water Resources East (WRE) Regional Plan and Anglian Water's draft Water Resources Management Plan 2024 (dWRMP24). If the scheme is selected, it will be subject to further in-combination and incombination effects assessment with the other selected options, neighbouring water company plans and neighbouring regional plans. Until the WRE Best Value Regional Plan has been

developed, it is not known when the scheme would be implemented, and therefore which other developments it could act in-combination with.

There is the potential for in-combination impacts on The Wash as a result of the SLR and Fens reservoir schemes. Further work will be undertaken during the next stages of project development to determine the extent of potential in-combination effects on The Wash, following the outcome of the ongoing hydrological assessments. Similarly, there are potential incombination effects as a result of SLR and Minworth SRO on the River Trent. Further work will be undertaken at during the next stages of project development to identify the potential incombination effects, based on the ongoing hydrological assessments (assuming Minworth SRO is taken forward to gate three).

For the purpose of this assessment only Local Development Frameworks, Development Consent Orders (DCOs) for Nationally Significant Infrastructure Projects, Hybrid Bills, Relevant Transport and Works Act Orders and relevant planning applications or allocations have been considered.

A search of the committed developments identified 24 within the search radius of 10km. The search concluded no committed developments would be impacted as a result of the SLR scheme, due to their locations not being hydrologically connected.

A search of major planning applications identified 17 within the search radius of relevance to WFD. The search concluded one major planning application had the potential of being impacted by the scheme. The development⁸ is to facilitate the Viking Link electrical interconnecter with an approximate capacity of 1400 megawatts (MW) extending from Revising, Jutland (Denmark) to Bicker Fen, Lincolnshire (United Kingdom). Works include installations of up to six onshore high voltage cables, link pillars along the cable rout, drainage mitigation and fibre optic cable. In relation to the SLR scheme, the cables intersect the River Witham between the SLR abstraction and discharge locations. The cables also intersect the transfer route between the River Witham and the A17. The Environmental Impact Assessment for this project states the construction of the cables will involve trenchless activities (i.e. Horizontal Directional Drilling) of the watercourse crossings. The activities associated with this construction method could lead to an increase in turbid run-off and spillages/leaks of fuel, oil or other pollutants; with the potential to impact on the water quality in the receiving the watercourses. Additionally, there could be an increase in soil erosion, along the exposed cable trenches. This has the potential to turbid (sediment laden) runoff affecting the nearby watercourses. Mitigation for The Viking Link Project includes areas of risk of spillage to be bunded or otherwise isolated to minimise the risk of hazardous substances entering the local watercourses, any surface water flowing into the trenches, will be pumped via settling tanks to remove sediment and potential contaminants before being discharged back into the watercourse, as well Environment Agency (EA) standard good practice measures (such as PPGs). Use of this mitigation would lead to minor adverse effects that are not significant. It is anticipated with effective mitigation from both the SLR scheme and the development, this will have a minor localised risk (no risk of deterioration) on the affected watercourses.

In addition, 3 mineral allocations were identified within the same waterbodies as SLR (see Table 5.6). SLR involves the installation of new transfers, with associated below ground structures for crossings in these waterbodies. Each of the mineral extraction sites may require dewatering to allow extraction of sand and gravel. Therefore, for all three of these projects there is the potential for in-combination effects due to impacts on river flows, from reduced baseflow from groundwater. However, the scale of works associated with SLR is likely to be small and

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National Grid (2017) Viking Link. Available at: <u>viewDocument (sholland.gov.uk)</u> 421065060 | 421065060-GT2-MMD-XX-XX-RP-Z-0009 | P02 | November 2022

temporary. Within suitable mitigation in place (such as the discharge of dewatering into local watercourses), is it anticipated that construction of SLR will not increase the risk of deterioration

in the water bodies associated with these mineral allocation projects. Further information is required on each of the mineral allocation projects to confirm this.

Table 5.6: Mineral allocation projects in same water bodies as SLR

| Project name | Description | Waterbody impacted |
|--------------------------------------|---|--|
| Baston No.2 Quarry Phase 2, Langtoft | Hanson Aggregates Quarry with proposed 2025 extension of existing site for 37 additional hectares of sand and gravel extraction | GB205031050705: Vernatt's Drain |
| Land off Main Road, Maxey | Potential sand and gravel at site across 33 hectares of land in Maxey | GB205031050595: Maxey Cut |
| West Deeping Development Brief | 36.1 hectare extension to existing King Street Quarry for 2027 | GB105031050600: Welland – conf Gwash to conf Greatford Cut |

Overall, it is assessed that there will be no in-combination effects due to the SLR project and other committed developments or major planning applications.

5.5 Requirements to improve confidence

The following requirements have been identified in the WFD assessment to improve confidence in the assessment of the surface water bodies:

- On-going refinement of the design in consultation with a WFD specialist.
- Land drainage and site drainage design, to understand which watercourses will be diverted/realigned and which are lost.
- Request for further specific details of mitigation measures assessment and RBMP measures (including HWMB measures where relevant) from the EA to understand the impact of the scheme, and to identify opportunities to improve the water body as part of the scheme.
- Update to WFD baseline data to include 2019 status in line with Cycle 3 2021-2027 RBMPs, once published.
- It is recommended that a hydrology study is undertaken to understand the potential reduction in catchment area, impacts on flow and therefore biological status elements for South Beck and Swaton Drains waterbodies.
- A hydrology study is recommended to understand potential impacts of reduced flow in the Trent from Sour to The Beck catchment on the hydrological regime and water quality (including both continuous and spot sample water quality monitoring).
- It is recommended additional water quality monitoring (both continuous and spot monitoring) is carried out on the four Witham waterbodies. This data should then be used in further water quality analysis to determine the effects of the discharge from the River Trent on water quality and therefore biology.
- It is recommended hydraulic modelling analysis is undertaken to determine the effects of the increase in flow volume and velocity on the four Witham waterbodies as a result of the discharge.
- Development of WFD mitigation to offset impacts of the scheme.
- Completion of full WFD assessment for consenting stage.

5.6 Mitigation measures

Potential mitigation measures have been suggested for each individual waterbody and scheme activity based on the risk that it poses. The potential mitigation measures should be considered further as design progresses.

Potential mitigation measures for the surface water bodies are set out below:

- Watercourses should be realigned around the reservoir footprint, where reasonably practicable, to re-provide lost habitat and flow into the main rivers.
- Channel modifications should seek to offer the change to incorporate environmental gain by widening drains to allow fringe vegetation to be retained or berms to be constructed, subjection to financial burdens during construction, land take and maintenance.⁹
- Considerations to avoid deterioration to hydromorphological determinants including how the flow and quantity of water changes over time.
- Intake structures should be fitted with appropriate fish / eel screens.
- INNS treatment for the transfer from the River Trent to the River Witham.
- If required, consideration of potential water quality treatment of water from River Trent before discharge to River Witham, if additional investigation into nutrient loads indicates a risk of WFD deterioration in water quality.
- Potential low flow releases from the reservoir into local watercourses to help maintain flow (if further investigation suggest this is needed).
- Industry good practice measures including PPG's.¹⁰
- Ensure all works carried out in accordance with guidance provided by the regulator, the EA, for working on/or near water.¹¹
- Consideration of mitigation options in line with guidance provided in 'A Guide to Management Strategies and Mitigation Measures for Achieving Good Ecological Potential in Fenland Waterbodies'.

A geomorphological walkover should be undertaken at future project stages to understand the status of each watercourse and identify potential suitable mitigation.

This environmental appraisal has highlighted that some uncertainties and risks remain that will need resolving. For WFD, a detailed strategy to develop a robust evidence base to inform subsequent assessments, and potentially derogation tests, will need to be developed in consultation with the regulators.

⁹ https://www.wlma.org.uk/uploads/Guide_GEP_Fenland_Water_Bodies_web.pdf

¹⁰ Although PPG's are considered to be out of date, they remain good practices for the industry and should be used as embedded mitigation when applicable.

¹¹ Environment Agency, Protecting and improving the water environment. Water Framework Directive compliance of physical works on or near rivers

¹² Mayer, L., Moodie, I., Carson, C., Vines, K., Nunns, M., Hall, K., Redding, M., Sharman, P. & Bonney, S. (2017) Good Ecological Potential in Fenland Waterbodies: A Guide to Management Strategies and Mitigation Measures for achieving Good Ecological Potential in Fenland Waterbodies. Association of Drainage Authorities & Environment Agency 421065060 | 421065060-GT2-MMD-XX-XX-RP-Z-0009 | P02 | | November 2022

6 Conclusions

6.1 Conclusion

For the assessment of the SLR scheme, a WFD assessment has been developed to assess the potential for WFD risks as a result of the scheme. The Level 1 assessment indicated that 24 surface waterbodies, with seven of them requiring further assessment.

Level 2 WFD assessments were completed for seven waterbodies and the findings indicate that there are precautionary WFD compliance risks associated with all seven of these waterbodies are set out in Table 6.1 below.

Table 6.1: Summary of Level 2 WFD assessment results

| Waterbody name | Waterbody ID | Maximum impact score (Level 2) | Potential impact score post mitigation (Level 2) |
|--|----------------|--------------------------------|--|
| Swaton Drains | GB105030056515 | 3 (major adverse) | 3 (major adverse) |
| South Beck | GB105030056520 | 2 (amber adverse) | 2 (amber adverse) |
| Trent from Soar to Beck | GB104028053110 | 2 (amber adverse) | 2 (amber adverse) |
| Witham – conf Cringle Bk to conf Brant | GB105030056780 | 3 (major adverse) | 3 (major adverse) |
| Witham conf Brant to conf Catchwater Drain | GB105030062370 | 2 (amber adverse) | 3 (major adverse) |
| Witham – conf Catchwater Drain to conf Bain | GB205030062425 | 2 (amber adverse) | 3 (major adverse) |
| Lower Witham – conf Bain to Grand Sluice | GB205030062426 | 3 (major adverse) | 3 (major adverse) |

The risks identified with the surface water bodies are due to the loss of catchment area and open watercourses, particularly associated with larger channel and decrease in the water quality. Mitigation could include realignment/diversion of the watercourses around the reservoir, but further assessment and design is needed to finalise mitigation needs.

It is possible that an exemption would need to be sought under Regulation 19 of the Water Environment (WFD) (England & Wales) Regulations 2017 (WFD Regulations 2017) in respect of potential deterioration in status of one or more waterbodies. Further investigation will be required

to fully quantify the impact, identify possible mitigation and determine the need for any potential exemption.

6.2 Recommendations

Area for future focus include:

- Consultation with the EA to present and discuss key WFD risks and proposed approach to improving certainty of assessment.
- Collation and review of Heavily Modified Waterbody (HMWB) and mitigation measures information from the EA to understand impact of the scheme and also to identify opportunities to improve the water body as part of the scheme.
- Update to WFD baseline data to include 2019 status in line with Cycle 3 2021-2027 RBMPs, once published.
- Land drainage and site drainage design to understand which watercourses will be diverted/realigned and which are lost.
- A hydrology study to understand potential impacts of reduced flow in the Trent from Sour to The Beck catchment on the hydrological regime and water quality (including both continuous and spot sample water quality monitoring).
- Additional water quality monitoring (both continuous and spot monitoring) is carried out on the four Witham waterbodies. This data should then be used in further water quality analysis to determine the effects of the discharge from the River Trent on water quality and therefore biology.
- It is recommended additional water quality modelling analysis should be undertaken to assist in determining the appropriate mitigation measures.
- It is recommended hydraulic modelling analysis is undertaken to determine the effects of the increase in flow volume and velocity on the four Witham waterbodies as a result of the discharge.
- Development of WFD mitigation to offset impacts of the scheme.
- Identify further work or modelling required to demonstrate compliance into during the next stages of project development.
- Completion of full WFD assessment for consenting stage.

A. Level 1 WFD assessment

| Impacted Waterbody ID | Impacted Waterbody Name | Waterbody type | Overall waterbody Classification | Overall waterbody Objective | Number of activities assessed | Count of activities scoring major benefit score | Count of activities scoring minor benefit score | Count of activities scoring minimal impact score | Count of activities scoring minor local impact score | Count of activities scoring medium impact score | Count of activities scoring high Leve score impact so | | Level 1 mean score | Carry through to level 2 assessment? |
|-----------------------|---|-------------------|----------------------------------|-----------------------------|-------------------------------|---|---|--|--|---|---|---|-----------------------|--------------------------------------|
| GB105030056520 | South Beck | River | Poor in 2015 | Moderate by 2027 | 13 | 0 | 0 | 2 | 8 | 1 | 2 | 3 | 1.23 | |
| GB105030056515 | Swaton Drains | River | Moderate in 201 | • | 12 | 0 | 0 | 2 | 7 | 1 | 2 | 3 | 1.25 | |
| GB104028053110 | Trent from Soar to The Beck | River | Moderate in 201 | L5 Moderate by 2015 | 9 | 0 | 0 | 1 | 6 | 1 | 1 | 3 | 1.22 | |
| GB105030056780 | Witham - conf Cringle Bk to conf Brant | River | | L5 Moderate by 2015 | 9 | 0 | 0 | 2 | 6 | 0 | 1 | 3 | 1.00 | |
| GB104028053111 | Slough Dyke Catchment (trib of Trent) | River | Moderate in 201 | L5 Moderate by 2015 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB104028053430 | The Fleet Upper Catchment (trib of Trent) | River | Bad in 2015 | Poor by 2027 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB205030051515 | Black Sluice IDB draining to the South Forty Foot Drain | River | Moderate in 201 | 15 Moderate by 2015 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB105030056490 | Ousemere Lode | River | Moderate in 201 | L5 Moderate by 2015 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB105030056480 | Billingborough Lode | River | Moderate in 201 | 15 Good by 2027 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB105030051555 | Pointon Lode | River | Moderate in 201 | 15 Good by 2027 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB105030051540 | Old Beck | River | Moderate in 201 | 15 Moderate by 2015 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB105031050720 | Glen | River | Moderate in 201 | 15 Good by 2027 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB205031050705 | Vernatt's Drain | River | Moderate in 201 | 15 Good by 2015 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB105031050600 | Welland - conf Gwash to conf Greatford Cut | River | Moderate in 201 | L5 Moderate by 2015 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB205031050595 | Maxey Cut | River | Moderate in 201 | L5 Moderate by 2015 | 6 | 0 | 0 | 1 | 5 | 0 | 0 | 1 | 0.83 | NO |
| GB105031050595 | Brook Drain (including Marholm Brook) | River | Moderate in 201 | L5 Moderate by 2015 | 6 | 0 | 0 | 2 | 4 | 0 | 0 | 1 | 0.67 | NO |
| GB205031050685 | Welland - conf Greatford Cut to tidal | River | Moderate in 201 | 15 Moderate by 2015 | 5 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0.80 | NO |
| GB40502G445000 | Cornbrash | GroundWate | erBPoor in 2015 | Poor in 2015 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1.00 | NO |
| GB40402G990300 | Lower Trent Erewash - Secondary Combined | GroundWate | erBPoor in 2015 | Good by 2027 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 1.00 | NO |
| GB40502G401400 | Witham Lias U | GroundWate | erBGood by 2015 | Good by 2027 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 1.00 | NO |
| GB105030062370 | Witham - conf Brant to conf Catchwater Drain | River | Moderate in 201 | 5 Moderate by 2015 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 3.00 | |
| GB205030062425 | Witham - conf Catchwater Drain to conf Bain | River | Moderate in 201 | 5 Moderate by 2015 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 3.00 | |
| GB205030062426 | Lower Witham – conf Bain to Grand Sluice | River | Moderate in 201 | 5 Moderate by 2015 | 5 | 0 | 0 | 1 | 2 | 0 | 2 | 3 | 1.60 | |

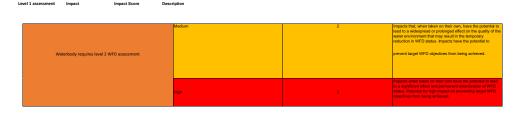
| | | | | | | | | Cringle Bk to conf | Slough Dyke T | atchment (trib | Black Sluice IDB draining to the south Forty Foot Drain | | Billingborough | | | _ | | Welland - conf Gwash to conf | | Brook Drain (including | Welland - conf Greatford Cut to | | Lower Trent Erewash Secondary Combined | | rant to conf atchwater | Witham 1st and 3rd IDBs draining to the River Witham | |
|--|---|---|---|---|----------------------------------|------------------------------------|------------------------------|---------------------------|-------------------|-------------------|--|-------------------|--------------------------|------------------|-------------------------------|---------------------------|-----------------------------------|---------------------------------|------------------------------|---------------------------|------------------------------------|-----------------------------|---|-------------------|---------------------------|---|-------------------|
| Component | Activity | Construction, Operation or Decommissioning | Assumptions / Mitigations assumed to be in place | | South Beck B GB10503005652 | Swaton Drains to GB105030056515 | The Beck GB104028053110 G | Brant B105030056780 GE | of Trent) c | of Trent) | 5030051515 GB10 | 5030056490 GB10 | Lode 5030056480 GB105 | 230051555 GB1050 | Old Beck 030051540 GB10500 | Glen 31050720 GB205031 | /ernatt's Drain 050705 GB10503 | Greatford Cut 1 | Maxey Cut 50595 GB1050310 | Marholm Brook) | 50685 GB40502G4 | Combrash 45000 GB40402G9 | 0300 GB40502G401 | Witham Lias | 70 GB2050300624 | 25 GB205030062426 | wer Witham |
| Below ground | Construction/repair of new tunnels and conduits | Construction | Tunnels and conduits will be constructed such that they will not form a preferential pathway for the flow of groundwater | groundwater only and not surface water | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | N/A | N/A | N/A |
| D.I. | Construction of below ground structures (shaft/retaining wall) with associated dewatering, with no sensitive groundwater feature within 500m | Construction | Risk assessments will be undertaken for excavation works and devatering to ensure no adverse impact or | Depending on construction method, site runoff will impact surface waters The specific below ground activities should affect the groundwater only and not surface water | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Below ground | Presence of new underground structure (tunnel/shaft/retaining wall), with no sensitive groundwater feature within 500m | Constitution | watercourses, wetland habitats or abstractions. Dewatering discharge will be treated before discharge. Land drainage will be provided on the upgradient side of the scheme such that they will not cause an increase in | i i | 1 | ' | | | | | | | | | | | | | | | | | | | | | |
| Below ground | | Operation | groundwater flooding risk. This drainage will be discharged into local watercourses to maintain flow. | ' | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Below ground | Construction of below ground structures (shaft/retaining wall) with associated dewatering, within 500m of a sensitive groundwater feature | Construction | Risk assessments will be undertaken for excavation work and dewatering to ensure no adverse impact or watercourses, welland habitats or abstractions. If impact likely appropriate miligation to be put in place Dewatering discharge will be treated before discharge. | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Below ground | Presence of new underground structure (tunnel/shaft/retaining wall) within 500m of a sensitive groundwater feature | of Operation | Land drainage will be provided on the upgradient side of the scheme such that they will not cause an increase in groundwater flooding risk. This drainage will be discharged into local watercourses to maintain flow. | The specific below ground activities should affect the groundwater only and not surface water | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Below ground | Construction of new cutting with external dewatering with no sensitive groundwate feature within 500m | er Construction | N/A Risk assessments will be undertaken for excavation works and devotation to ensure no adverse impact or | The specific below ground activities should affect the groundwater only and not surface water | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Below ground | Construction of new cutting below ground excavation with external dewatering within 500m of a sensitive groundwater feature | Construction | and dewatering to ensure no adverse impact or watercourses, wetland habitats or abstractions. If impact likely appropriate mitigation to be put in place Dewatering discharge will be treated before discharge. | The specific below ground activities should affect the groundwater only and not surface water | 2 | 2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Below ground Catchment management | Construction of new culvert Construction of new culvert Considering exchange or education programme | Construction | Apopropriate precautions will be taken when vooking in the channels of or algeoret in switecrosses, providing new clubrets and or extending outwest, if required, in clubrets and or extending outwest, if required, in clubrets and or extending outwest, if required in deposition of all or releases of other forms of suspended material or pollution within the water column. All measures will be in linew with the requirements alout within the Environment Agency's PPGs. (PPGs). Certenii Guide to Environment Agency's PPGs. (PPGs). Certenii Guide to mere water: and PPG23 Maintenance of shoutures over water). | The specific below ground activities should affect the groundwater only and not surface waiter | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Catchment management | Changes to land management practices to reduce pesticides, nutrients, sediment flooding relating to a groundwater source | Operation | The impact of the scheme will be felt in the long term. The scheme will be focused around the SPZ1 and 2 areas of the groundwater source of interest. These schemes are smaller | N/A -1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Catchment management | Changes to land management practices to reduce pesticides, nutrients, sediment flooding relating to a surface water source | or Operation | scale than surface water. An immediate change may be seen in the water quality downstream of the changes to land management. It is | N/A -2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Augustonii C | | | assumed there is a high level of engagement from those relevant for reducing the parameter of interest. There may be minor short term impacts during the | | | | | | | | | | | | | | | | | | | | | | | | |
| Catchment management Catchment management | River restoration - construction phase River restoration - after construction | Construction Operation | construction phase River restorations will be selected in line with WINEP criteria The restorations are to improve hydrological flows in the | N/A 1 N/A -2 | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A |
| | Flow augmentation and licensing | Operation | local area N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | | N/A | N/A | | N/A | N/A | N/A | | N/A | | | N/A | N/A | N/A | N/A |
| | Terrestrial habitat creation/management - creation Terrestrial habitat creation/management - management Natural water retention measures (including NFM and wetland creation) | Construction Operation Construction | N/A N/A N/A | N/A 1 N/A N/A N/A 1 | N/A N/A N/A | N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A | N/A N/A N/A | N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A | N/A N/A N/A |
| Catchment management | construction Natural water retention measures (including NFM and wetland creation) | Operation | NA | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Catchment management | Fisheries management | Operation | Assumed to be in place due to WINEP driver or similar criteria to improve ecological status of the river. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Catchment management | Sustainable Urban Drainage Systems (SUDS) - construction Sustainable Urban Drainage Systems (SUDS) - after construction | Construction | NA . | SuDS should be employed to manage flooding during construction phase. SuDS may also be required to control and treat surface water runolf during constrution | 1 | 1 | 1 | ' | 1 | ' | , | 1 | 1 | ' | 1 | ' | <u>'</u> | 1 | , | ' | ' | 1 | ' | ' | NA | N/A | NA |
| Catchment management | | Operation | Assumed to presented as an option at local scale. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Catchment management | Integrated catchment management | Operation | This assumes a short term benefit to WFD as imposed usag reduction should allow for recovery in the river or aquifer whici may improve WFD status from pre restriction status. | N/A -2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Culvert | Construction of new inverted siphon or drop inlet culvert | Construction | Appropriate precautions will be taken when working in the channels of or adjacent to watercurses, providing new culvets and or extending culverts, if required, to appropriately manage flood risk and the potential for deposition of all or release of other forms of suspended material or pollution within the water column. All measures will be in line with the requirements set out within the Environment "Agency's PFOs. ("PGE": General Guide to | N/A 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Culvert | Presence of new culvert, in headwaters or on drainage disches | Operation | Prevention of Pollution; PPGS: Works and maintenance in or near water: and PPG23 Maintenance of structures over water). Appropriate improvements to local habitat to offset the presence of the culvert | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Culvert Culvert | Presence of new culvert mid or lower catchment Presence of new inverted siphon or drop inlet culvert | Operation Operation | No assumed mitigations No assumed mitigations No assumed mitigations | N/A 2 N/A 3 | N/A | N/A | | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A | N/A N/A |
| Culvert | Removal of significant in channel watercourse structure (such as impassable weir Removal of existing culverts or other in channel watercourse structure | Decommissioning | No assumed mitigations | N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A | N/A | N/A | N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | | | | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A |
| Discharge Discharge | High volume discharge of water with a quality element of higher WFD status than the receiving water body High volume discharge of water with a quality element of a lower WFD status than | Operation Operation | No assumed mitigations No assumed mitigations | N/A 3 | N/A N/A | N/A N/A | N/A N/A | N/A 3 | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A 3 | N/A 3 | N/A 3 |
| Discharge | the receiving water body Low volume discharge of water with a quality element of the same or higher WFD | | No assumed mitigations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Discharge | status than the receiving water body Low volume discharge of water with a quality element of a lower WFD status than the receiving water body | | No assumed mitigations | N/A 2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Discharge Discharge | Low volume discharge of water with a quality element of the same WFD status as the receiving water body High volume discharge of water with a quality element of the same WFD status as | | No assumed mitigations No assumed mitigations | N/A 0 Discharges from the abstraction and discharge catchments are at Moderate chemical status | N/A | N/A N/A | N/A N/A | N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A |
| Discharge | the receiving water body New WTW discharge to watercourse | Operation | No assumed mitigations | N/A 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Discharge Discharge | Transfer of water via a river, canal or aqueduct New discharge of highly saline water to a coastal or transitional waterbody | Operation Operation | No assumed mitigations No assumed mitigations | The discharged water will be transfer through 3 catchments 2 before being abstracted N/A 3 | N/A N/A | N/A N/A | 2 N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A |
| Discharge Discharge | New discharge of highly saline water to a costal or transitional waterbody New discharge of highly saline water to a surface waterbody or | Operation | No assumed mitigations Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood rist | N/A 3 | | | | | | N/A | N/A | N/A | | | | | | N/A | N/A | N/A | | | | N/A | N/A | | |
| Discharge | Construction of a new outfall structure to a watercourse, coastal waters, transition waters or reservoir | nal Construction | and the potential for deposition of silt or release of other forms of suspended material or pollution within the water column. All measures will be a fine with the requirements so out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG5: Works and maintenance in or near water). | Outfall structures will be constructed for the discharges | 1 | N/A | N/A | 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1 | N/A | N/A | N/A |
| Discharge | Cessation of existing discharge to a watercourse | Construction | No assumed misgations Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood rist | N/A 2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Discharge | Maintenance and use of river, coestal or transitional water outfall | Operation | channels of watercourses, to appropriately manage flood into and the potential for deposition of all or release of other forms of suspended material or pollution within the water column. All measures will be in ine with the requirements so out within the Environment Agency's PPGs (PPG: General Guide to Prevention of Pollution; PPGS: Works and maintenance in or near water.) | Assumes there will be maintanence needed 0 | 0 | N/A | N/A | 0 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Groundwater | Construction of a new abstraction borehole headworks and associated infrastructure | Construction | No assumed mitigations | N/A 0 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | Work will be carried out under appropriate consent from | | | _ | | | | | | | | | | | | | | | | | | | | | |
| Groundwater Groundwater | Refurbishment of existing boreholes Drilling new abstraction boreholes | Construction Construction | the EA Work will be carried out under appropriate consent from the | N/A 0 | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A |
| Groundwater | Maintenance and use of abstraction borehole infrastructure | Operation | EA No assumed mitigations | N/A 0 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Habitat | Creation of significant areas of riparian habitats | Construction | Appropriate precautions will be taken when working in the channels of or adjacent to watercurses, to appropriately manage flood risk and the potential for deposition of silt or release of other forms of suspended material or pollution within the water column. All measures will be in fine with the requirements set out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPGS: Works and maintenance in or near water). | N/A -2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 1 | I. | | 1 | | | | | | | | | | | | | | | | | | | | | | | |

| | | | Appropriate precautions will be taken when working in the channels of or adjacent to watercourses, to appropriately | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|--|---|---|---|---|---|--|
| | | | manage flood risk and the potential for deposition of silt or release of other forms of suspended material or pollution within the water column. All measures will be in line with the | | | | | | | | | | | | | | | | | | | | | | | | |
| Habitat | Minor habitat creation | Construction | requirements set out within the Environment Agency's PPGs | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | (PPG1: General Guide to Prevention of Pollution; PPG5: Works and maintenance in or near water). | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Appropriate precautions will be taken when working in the channels of or adjacent to watercourses, to appropriately | | | | | | | | | | | | | | | | | | | | | | | | |
| Makitat | Daylighting of existing culverts | Construction | manage flood risk and the potential for deposition of silt or release of other forms of suspended material or pollution | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Piabliat | Daylighting or existing curvers | Construction | within the water column. All measures will be in line with the requirements set out within the Environment Agency's PPGs | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A | N/A | NA | NA | NA | N/A | N/A | NA | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | (PPG1: General Guide to Prevention of Pollution; PPG5: Works and maintenance in or near water). | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood ris and the potential for deposition of silt or release of other | k | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Habitat | Channel realignment with natural bed substrate and good riparian connections | Operation | column. All measures will be in line with the requirements so out within the Environment Agency's PPGs (PPG1: General | t MA | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG5: Works and maintenance in or near water). | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood ris | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | and the potential for deposition of silt or release of other forms of suspended material or pollution within the water | ^ | | | | | | | | | | | | | | | | | | | | | | | |
| Habitat | Channel realignment with artificial banks/base | Operation | column. All measures will be in line with the requirements so out within the Environment Agency's PPGs (PPG1: General | t N/A | 1 | 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | Guide to Prevention of Pollution; PPG5: Works and maintenance in or near water). | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Appropriate precautions will be taken when working in the | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | channels of watercourses, to appropriately manage flood ris and the potential for deposition of silt or release of other | ` | | | | | | | | | | | | | | | | | | | | | | | |
| Intake | Construction or modification of a new pumping station and/or intake from raw wate (river or coastal waters) | Construction | forms of suspended material or pollution within the water column. All measures will be in line with the requirements so | New inlet structure will impact existing water body. | N/A | N/A | 1 | N/A | 1 | N/A | N/A | N/A | 1 | N/A | N/A | N/A | N/A |
| | | | out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG5: Works and maintenance in or near water). | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood ris | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | k | | | | | | | | | | | | | | | | | | | | | | | |
| Intake | Maintenance and use of river intakes | Operation | forms of suspended material or pollution within the water column. All measures will be in line with the requirements se | t Maintenance of new inlet structures 1 | N/A | N/A | 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG5: Works and | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | maintenance in or near water). Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood ris | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | * | | | | | | | | | | | | | | | | | | | | | | | |
| Intake | Maintenance and use of coastal intakes | Operation | forms of suspended material or pollution within the water column. All measures will be in line with the requirements se | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | out within the Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG5: Works and | | | | | | | | | | | | | | | | | | | | | | | | |
| Licence | Use of existing ground and surface water abstraction licences, within licen | ce Operation | maintenance in or near water). No assumed mitigations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Licence | conditions and recent abstraction patterns | Operation | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | NIA. | N/A | NI/A | N/A | N/A | BUA | | N/A |
| Licence | Use of existing surface water and groundwater abstraction licences, within existing licence conditions but outside of the recent actual rates | g Operation | No assumed mitigations | 2 | N/A | N/A | N/A | N/A | N/A | IN/A | n/A | PerA. | IVA | N/A | NeA | NA | NA | NA | N/A | NA | IVA | N/A | N/A | N/A | N/A | N/A | N/A |
| | Emergency or drought use of existing surface water or groundwater abstraction | | | | | | | | | | | | | | | T | | Ī | T | | | | | | T | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Licence | outside of licence conditions | Operation | No assumed miligations | N/A 2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Licence | New or increased surface water abstraction | Operation | No assumed miligations | New abstraction within these catchments 3 | N/A | N/A | 3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Licence | New or increased groundwater abstraction New coastal or transitional waterbody abstraction licence | Operation Operation | No assumed mitigations No assumed mitigations | N/A 3 N/A 3 | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | | N/A N/A | N/A N/A | | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A | 3 N/A |
| Licence | Reduction of coastal or transitional waterbody abstraction licence | Operation | No assumed miligations | N/A | N/A | | N/A | N/A | N/A | | N/A | | | | | N/A | N/A | 1011 | N/A | N/A | N/A | N/A | N/A | N/A | | N/A | |
| Licence | Increase of coastal or transitional waterbody abstraction licence Trenching and laying of pipe lines within the interfluves of a catchment (no | Operation Construction | No assumed mitigations Assumed that bedding material for pipelines will be | N/A 2 Presume trenching and laying will be used for most 0 | N/A | N/A | N/A | N/A | N/A N/A | N/A | N/A | N/A | N/A N/A | N/A | N/A | N/A | N/A | N/A N/A | N/A | N/A | N/A | N/A N/A | N/A | N/A | N/A | N/A | N/A N/A |
| ripeliles | watercourse crossings) | Consucion | constructed such that they do not form preferential pathways for groundwater flow. | lengths of pipe. Sites should look to capture runoff from sites and treat before discharge. | NA | N/A | N/A | NA | IWA | N/A | NA | N/A | NA | N/A | NA | N/A | IVA | NA | NOC | NA | NA | NO | NA | N/A | NA | NOX | NA |
| | | | Assumed that bedding material for pipelines will be | , | | | | | | | | | | | | | | | | | | | | | | | |
| | | | constructed such that they do not form preferential pathways for groundwater flow. | Trenchless activities used in locations for rivers, | | | | | | | | | | | | | | | | | | | | | | | |
| Pipelines | Trenching and laying of pipe lines involving watercourse crossings | Construction | Assumed that watercourse crossings will be carried out using directional drilling or if the watercourse needs to be temporarily diverted, appropriate measures will be in place to | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | N/A | N/A | N/A | N/A | N/A | 1 |
| | | | protect ecology and watercourse will be returned back to its | b cosses using sensing and saying. | | | | | | | | | | | | | | | | | | | | | | | |
| Pipelines | Trenching and laying of pipe lines involving large watercourse crossings with channel modifications | in Construction | natural state. Flood risk assessment will be carried out to ensure that new | Only trenchless activities are designed when there is a water 2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | in channel features will not adversely impact on flood risk | crossing | | | | | | | | | | | | | | | | | | | | | | | |
| Pipelines | Maintenance of pipe lines Draining of pipelines for maintenance | Operation | No assumed mitigations If water is drained to local watercourse, this will be short term | N/A U | 0 | U | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | N/A N/A | N/A N/A | N/A N/A | N/A N/A | N/A N/A | 0 |
| Pinelines | | | | | 1 | 1 | | | | | | | | | - | | | | | | | | | | | | |
| Pipelines Pipelines | | Operation Decommissioning | and temporary impacts only No assumed mitigations | Surveys not yet completed, so have presumed 0 | 1 N/A | 1 N/A | 1 N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Pipelines Pipelines | removal / decommissioning of existing pipeline (no watercourse crossings) | Decommissioning | and temporary impacts only No assumed mitigations | | N/A | 1 N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Pipelines Pipelines | | Decommissioning | and temporary impacts only No assumed mitigations Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood ris | Surveys not yet completed, so have presumed construction work to remove existing infrastructure is possible. Included for worst-case scenario. | 1 N/A | 1 N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Pipelines Pipelines | removal / decommissioning of existing pipeline (no watercourse crossings) | Decommissioning | and temporary impacts only No assumed miligations Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood ris and the potential for deposition of all or release of other forms of suspended material or pollution within the water | Surveys not yet completed, so have presumed construction work to remove existing infrastructure is possible. Included for worst-case scenario. Surveys not yet completed, so have presumed construction of the complete control of the complete contr | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Pipelines Pipelines Pipelines | | Decommissioning | and temporary impacts only No assumed migations Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage floot is and the potential for deposition of sill or release of other forms of auspended material or pollution within the water and the potential or the pollution within the water and the potential or the pollution within the water out within the Emvironment August (PEG IPPGT). General | Surveys not yet completed, so have presumed construction work to remove existing infrastructure is possible. Included for worst-case scenario. Surveys not yet completed, so have presumed construction of the complete control of the complete contr | N/A | 1 N/A N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A N/A | N/A | N/A N/A | N/A N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Pipelines Pipelines Pipelines | removal / decommissioning of existing pipeline (no watercourse crossings) removal / decommissioning of existing pipeline (involving watercourse crossings) | Decommissioning | and temporary impacts only No assumed miligations Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood ris and the potential for deposition of all or release of other forms of suspended material or pollution within the water | Surveys, not yet completed, so have presumed consolidation with to immore existing inflationations is ossible included for worst-case scenario. Surveys, not yet completed, so have presumed construction work to remove existing infrastructure is possible. Included for worst-case scenario. | | | N/A | | | | | | | | | | | | | | | N/A N/A | N/A | N/A N/A | | | |
| Pipelines Pipelines Pipelines Pipelines Pipelines | removal / decommissioning of existing pipeline (no watercourse crossings) removal / decommissioning of existing pipeline (no watercourse crossings) removal / decommissioning of existing pipeline (novolving watercourse crossings) New above ground pipelines (crossing watercourse) | Decommissioning Decommissioning Construction | and temporary impacts only No assumed mitigations Appropriate precautions will be taken when working in the channels of watercourses, to appropriately manage flood in and the potential for deposition of all or release of other forms of suspended material or pollution within the water column. All measures will be in in with the requirements so out within the Environment Agency's PPCs (PPCs Cemeral and Committee of the Committee | Surveys not yet completed, so have presumed connection work to more ording inflatabilities is possible included for worst-case scenario. Surveys not yet completed, so have presumed constitution work to remove eating inflatabilities of possible included for worst-case scenario. NA 2 | N/A | N/A | N/A N/A | N/A N/A N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | N/A | N/A | N/A | N/A | N/A N/A | N/A N/A | N/A N/A | N/A | N/A | N/A |
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| Usage changes and | | Operation | Assumes use of water would not be for drinking unless | N/A | 1 | N/A |
|------------------------|--|-----------------|--|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | I |
| abstraction management | Tankering raw water or treated effluent | | sent to WTW for full treatment. | | | | | | | | | | | | | | | | | | | | | | | | | |
| WTW | Modification of an existing WTW or pumping station relating to treated water | Construction | No assumed mitigations | N/A | 0 | N/A | 0 | N/A |
| WTW | Construction of a new WTW or pumping station relating to treated water | Construction | No assumed mitigations | Construction of a new WTW set back from the | 0 | N/A |
| wtw | Construction of a new WTW or pumping station relating to raw water | Construction | No assumed misgations | watercourse It is assumed maintenance will be required for the new | 1 | N/A | 1 | N/A |
| | | | | WIW | | | | | | | | | | | | | | | | | | | | | | | | |
| WTW | Maintenance and use of pumping stations and WTW | Operation | No assumed mitigations | N/A | 0 | N/A | 0 | N/A |
| wtw | Removal of existing WTW and associated discharge | Decommissioning | Appropriate precautions will be taken when working in the channels of watercourse, to appropriately manage flood and the potential for deposition of still or release of other forms of supereder material or pollution within the water column. All measures will be in the with the requirements out within the Environment Agency's PPGs. (PPGs: Gener Guide to Prevention of Pollution; PPGs: Works and maniferance in or near work.) | isk | a | N/A |
| WTW | Small desalination temporary unit | Operation | Assumes no construction is required below ground. Unit would be temporary with no impact on WFD | N/A | 0 | N/A |
| WTW | Construction or modification of a desalination plant | Construction | No assumed mitigations | N/A | 1 | N/A |
| WTW | Maintenance and use of desalination plant | Operation | No assumed mitigations | N/A | 0 | N/A |

Each activity has been predefined an impact score. The maximum impact score for each waterbook/determines if the waterbook/requires further assessment or not. Any waterbodies containing activities that score a 2 or 3 will require a level 2 assessment where mitigation must be demonstrated and PoN, RNAGs and the data will be considered.

| | Very beneficial | -2 | Impacts that, taken on their own, have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody |
|---|-----------------|----|---|
| | Beneficial | 4 | Impacts that, when taken on their own, have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements |
| Waterbody passes Level 1 WFD assessment | No/minimal | 0 | No measurable change in the quality of the water environment or the ability for target WFD objectives to be achieved. |
| | Low | 1 | Impacts that, when taken on their own, have the potential to lead to a minor localised, short-term and fully reversible effects on one or more of the quality elements but would not result in the lowering of WFD status. Impacts would be very unlikely to prevent any target WFD objectives from being achieved. |



B. Level 2 WFD assessments

Strategic Resource Option WFD assessment for: SLR 41

| Waterbody ID | Waterbody name | Waterbody type | Maximum Impact score N | Maximum Impact score level 2 | Maximum post mitigation impact score level 2 | Deterioration between status classes | Impediments to GES/GEP | Compromises water body objectives | Assists attainment of water body objectives |
|----------------|--|----------------|------------------------|------------------------------------|--|--|---------------------------------------|---------------------------------------|---|
| GB105030056520 | South Beck | River | 3 | 1 | 1 | No | No | No | No |
| GB105030056515 | Swaton Drains | River | 3 | 3 | 3 | Yes | Yes | Yes | No |
| GB104028053110 | Trent from Soar to The Beck | River | 3 | 2 | 2 | No | No | No | no |
| GB104028053111 | Slough Dyke Catchment (trib of Trent) | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB104028053430 | The Fleet Upper Catchment (trib of Trent) | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB205030051515 | Black Sluice IDB draining to the South Forty Foo | ot River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105030056490 | Ousemere Lode | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105030056480 | Billingborough Lode | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105030051555 | Pointon Lode | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105030051540 | Old Beck | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105031050720 | Glen | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB205031050705 | Vernatt's Drain | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105031050600 | Welland - conf Gwash to conf Greatford Cut | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB205031050595 | Maxey Cut | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105031050595 | Brook Drain (including Marholm Brook) | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB205031050685 | Welland - conf Greatford Cut to tidal | River | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |

| GB40502G445000 | Cornbrash | GroundWaterBody | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
|----------------|--|-----------------|---|------------------------------------|---------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------|
| GB40402G990300 | Lower Trent Erewash - Secondary Combined | GroundWaterBody | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB40502G401400 | Witham Lias U | GroundWaterBody | 1 | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required | Level 2 assessment not required |
| GB105030056780 | Witham - conf Cringle Bk to conf Brant | River | 3 | 3 | 3 | Yes | Yes | Yes | No |
| GB105030062370 | Witham - conf Brant to conf Catchwater Drain | River | 3 | 3 | 3 | Yes | Yes | Yes | No |
| GB205030062425 | Witham - conf Catchwater Drain to conf Bain | River | 3 | 3 | 3 | Yes | Yes | Yes | No |
| GB205030062426 | Lower Witham - conf Bain to Grand Sluice | River | 3 | 3 | 3 | Yes | Yes | Yes | No |

SLR 41 - Level 2 WFD assessment Combined.xlsm Workbook name Polar mitigation impact

Deterioration between Engligieration 1 to Good Engligieration 1 to Good State (1975) and State (1975 Level 2 sheet Waterbody Name 1) On-going refinement of the design. 2) Land drainage and site drainage design to understand which watercourses will be diverted/realigned and which are lost. Any large watercourses should be realigned to provide lost 3) hydrology study to understand potential reduction habitat and flow into the main rivers in catchment area (and impacts on flow) Further details on mitigation measure assessment from EA to request for further specific details of mitigation understand impact of the scheme and also to B105030056520 TRUE South Beck identify measures assessment and RBMP measures (including opportunities to improve the water body as part of the scheme A/HWMB measures where relevant) from EA update to WFD baseline data to include 2019 statusin line with Cycle 3 2021-2027 RBMPs once 1) On-going refinement of the design. The reservoir will lead to the loss of approximately 28% of the 2) Land drainage and site drainage design tocatchment and therefore a reduction in flows in both channels understand which watercourses will be Need to offset loss of in-channel habitat and/or watercourse TRUE Swaton Drains GB105030056515 Flow support release of water from the reservoir could be in catchment area (and impacts on flow) considered to support flows, but would need consideration of 4) Request for further specific details of mitigationwater quality. 4) request or utruer specific details of miligation/water quarty, measures assessment and RBMP measures (including Further details on mitigation measures sassessment from EA to A/NWMB measures where relevant) from EA understand impact of the scheme and also to identify 5) update to WTD baseline data to include 2015 statusopportunities to improve the water body as part of the scheme in line with Cycle 3 2021-2027 RBMPs once published. 1) On-going refinement of the design. 1) Unigong remnement of the design.
2) Hydrology study to understand potential impact of reduced flow in the catchment on hydrological water quality (include) both continuous and substrained to the catchment on the catchment on hydrological water quality monitoring in the catchment of the catch GB104028053110 TRUE Trent from Soar to The Beck assessment and RBMP measures (including elements. This will help determine appropriate mitigation A/HWMB measures where relevant) from EA measures. 4) update to WFD baseline data to include 2019 status in line with Cycle 3 2021-2027 RBMPs once published. On-going refinement of the design. Hydrology study to understand the impact ofincreased flow in the catchment on hydrological regime and biological status elements, Water quality modelling and INNS treatment has been provided between the River Trent water quarity modeling and monitoring (bothcontinuous and spot sampling) to understand the impact of changes in water quality and abstraction and the transfer to the River Witham Further water quality modelling (both continuous and sport sequent for further specific details of mitigationmensures assessment and BBMP measures (including A/HVMM8 measures where recivantly from D. SB105030056780 TRUE Witham - conf Cringle Bk to conf Brant undate to WFD baseline data to include 2019 statusin line with Cycle 3 2021-2027 RBMPs once published. 6) Hydraulic modelling to understand the impact on flow and velocity as a result of the abstraction On-going refinement of the design. 2) Hydrology study to understand the impact ofincreased flow in the catchment on the impact offincreased flow in the catchment of hydrological regime and biological status elements, and hydrological regime and biological status elements, and incomplete and biological status elements, and incomplete and biological status and status elements belong to the discharge in water quality additaction and the transfer to the River Witham between the original properties of the River Witham discharged to the discharge of the regime of the transfer to the River Witham discharged to the discharged to the discharged to the transfer to the River Witham discharged to the regime of the transfer to the River Witham discharged to the regime of the transfer to the River Witham discharged to the regime of the transfer to the River Witham discharged to the discharged to the transfer to the River Witham discharged to the River Witham discharged to the restrict the River Witham discharged to the restrict the River Witham discharged to the River Witham discharged the transfer to the River Witham discharged the transfer to the River Witham discharged the River Wi TRUE Witham - conf Brant to conf Catchwater
Drain SB105030062370 relevant) from EA 5) update to WFD baseline data to include 2019 statusin line with Cycle 3 2021-2027 RBMPs once published. 6) Hydraulic modelling to understand the impact on flow and velocity as a result of the abstraction On-going refinement of the design. Hydrology study to understand the impact ofincreased flow in the catchment on hydrological regime and biological status elements, Water quality modelling and INNS treatment has been provided between the River Trent a) Water quality modelling and monitoring (bothcontinuous and spot sampling) to understand the impact of change in water quality and therefore biology due to the discharge, and the therefore biology due to the discharge, and the discharge of th TRUE Witham - conf Catchwater Drain to conf Bain

5) update to WFD baseline data to include 2019 statusin line with Cycle 3 2021-2027 RBMPs once published. 6) Hydraulic modelling to understand the impact on flow and velocity as a result

of the abstraction

| 1) On-going refinement of the design. 2) Hydridogs status elements. 3) Water quality modelling and monitoring (bothabstraction and the transfer to the design three withham continuous and spot againing to measures in the state of the stander to the stander of stander to the st | Arrows that short ratios from this materials in the stand to coloride |
|--|---|
|--|---|

| Option | 518.41 | Go to RNAG/PoM table at bottom of the page | 5 | | | | | | | | | | | T | | | | | | | 1 |
|--|--|--|--|--|--------------|--|---|--|---|--|---|---|--|--|--|--|--|--|--|--|--|
| | GB105030056520 | | | | | | | Construction, Operation or Decommissioning | ctivity | New Impos | unding reservoir (in line/next to watercourse, or l | arge compared to watercourse) - excluding abstr | raction/discharge | | Maintenan | ce of pipe lines (including draining pip | idice) | | New pipe lines involving watercourse | crossings with no in channel modifications | Below ground structures (shaft/retaining wall) with associated dewastering |
| Waterbody name Waterbody type | South Beck Roer | | | | | | | Potential Impacts of asset (following con embedded mitigation) | ideration of | | | and operation Changes in flow velocity and volume (increase or decrease) | e Changes to water body hydromorphology leading to changes | | Changes in flow velocity and volume | Operation inges in sedimentation deposition | Change in water quality due to new or changes to existing discharge of surface water into surface water body | | | and operation Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream | Operation Change in water quality due to discharge of groundwater to a surface water body |
| Hydromorphological designation | Heavily Modified | Action: Obtain HMW8 measures information from the | | | | | | Biological Effects | Change | es to channel footprint | Noise and vibration | 1 | Changes to water body hydromorphology leading to change in river processes and habitats upstream and downstream | Noise and vibration | (increase or decrease) | 1 | | water body | Changes in sedimentation deposition | 1 | · · |
| Overall status | Poor | Environment Agency to add to the RNAG/PoM table. | | | | | | Hydromorphological supporting elements | | , | V | 4 | , | х | х | х | х | x | , | y | , |
| Overall status objective | Moderate by 2027 | | | | | | | Physicochemical Effects | | × | х | х | × | × | 7 | V | V | 1 | × | × | , |
| | | | _ | | | | Does the component comply with objectives (post mitigation) | WFD Chemical effects | | × | × | х | х | х | * | 4 | * | 1 | х | х | х |
| WFD status Component | WFD quality element | Method of checking compliance | Classification | Objective | Impact score | Data confidence Design certainty Deterroration between | status classes impedments to GES/06 | To Jack was a Mitigation applied Mitigation applied | ou eac | ment of the impact of 'Changes to channel footprint' ch element | Comment of the impact of 'Noise and vibration' on each element | Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element | Comment of the impact of 'Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream' on each element | Comment of the impact of Notice and vibration on each element | Comment of the impact of 'Chaigss in flow velocity and volume (increase or decrease)' on each element | mment of the impact of 'Changes in limentation deposition' on each ment | Comment of the impact of 'Change in water quality due to new or changes to existing dischange of surface water into surface water body' on each element | Comment of the impact of 'Change in BNS present in surface water body' on each element | Comment of the impact of 'Changes in sedimentation deposition' on each element | Comment of the impact of 'Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream' on each element | Comment of the impact of 'Change in water quality due to discharge of groundwater to a surface water body' on each element |
| Biological quality elements | Fish Novertebrates | Guidance document available | Poor in 2015 Good in 2015 | Moderate by 2027 Good by 2015 | 1 | | No No | No No Author water quality recidiling is required to determine the extent of impacts within this catchment | The res drainag This w channs and mainta value, effects | server footgriet will result in a loss of some small fising ger channis. If illust to the localizated loss of habitat. Siere all the who lost are maintained field ditches, regular designing assence are illusty to already impact on the habitat and therefore this is assessed to be mirror localized on. | to the and vibration may impact the biological quality elements within this sustendary as a greated of the construction of of the reservoir. Instendial tempory disturbance design geometrication, though fish are likely to move away from the area and macceptytes and reversibilities. | the reservoir footprint will result in a loss approximately 4% of the cotchment and those of some small field drainage channels. This set will loss will small for small refucction in flow and velocity, which could impact on biological quality elements. | the reservoir footprint will result in loss of some small field of desirage disthes, which could led to a sight reduction in the flow and wisconi price to South Seed which these three countries are to the reduction in flow in the south Seed of the reduction in flow in the state of the reduction in flow in the state of the reduction in flow in the seed of the reduction in the seed of the seed of the reduction in the seed of the seed of the reduction in the seed of the seed of the reduction in the seed of th | Noise and vibration may impact the biologic quality elements within this waterbody as a result of the construction of the princips. Puternis temporary disturbence during construction, thought fish an about the construction, thought fish an accomplying and interestinate unitarity to be wealther to make a compact of the construction of the waterbase of the construction of the construction of the waterbase of the construction of the construction of the construction of the waterbase of the construction of the construction of the construction of the waterbase of the construction of the construction of the construction of the waterbase of the construction of the c | to measurable effects articipated as a non- essant of changes in flow and velocity of r | measurable effects articipated as ut thanges in sedimentation deposition | No measurable effects articipated as a reso of changes in water quality due to new changes in wisting dischange of surface water in surface water body | alt No measurable effects anticipated as result of changes in INVS present in the surface water body | to measurable effects anticipated as a result of a changes in sedimentation deposition on the biological guality elements. Act this stage it is assumed construction will invol- terechies activities. | No measurable effects anticipated as a result of change in hydromorphology on the bological quality elements that the second operation will involve trenchless activities. | is Discharge of groundwater to surface water during a contraction has the potential to impact on water quality: which could lead to temporary minor localised effects on biological quality elements |
| | Macrophytes and Phytoberthios Combined | Calculator available | Poor in 2015 | Moderate by 2015 | i i | Low Low N | No No | No | 1 biologi | ical quality elements. | unlikely to be sensitive to impact | The size of the reservoir footprint will result is | changes in hydromorphology | | | | | | | | |
| Hydromorphological Supporting Elements | Hydrological Regime | | Does Not Support Good in 2015 | Does Not Support Good by 2015 | 1 | Low Low N | No No | No Assumes best practice measures will be implemented | | elourable effects anticipated as It of change in channel int | No measurable effects anticipated as a result of noise and vibration | a loss of approximately 4% of the catchment and the loss of some small field drainage channels. This loss will lead to small reduction in flow and velocity in a waterbody where hydrological regime already does not support good | | | | | | | changes in sedimentation deposition on the | No measurable effects anticipated as a result of changes in hydromorphology on the hydrological regime and mitigation measures assessment. At this till stage it is assumed construction will involve trenchiess activities. | construction has the potential to impact the hydrological regime and therefore is assessed to be a minor localised beneficial effect. |
| | Mitigation Measures Assessment | | Moderate or less in 2015 | Good by 2027 | 1 | | | No Further specific details of mitigation measures assessment will be requested at the next stage. | some s | ze of the reservoir footprint will result in a loss of small field drainage channels, which could impact r mitigation measures assessment. | No measurable effects anticipated as a result of noise and vibration | Minor localised impacts are expected to the mitigation measures assessment due to the increase in physical modification | Minor localised impacts are expected to the mitigation measures assessment due to the increase in physical modification | | | | | | | | No measurable effects anticipated as a result of changes in water quality |
| Physico-chemical quality elements | Armonia (total as N) | | High in 2015 | Good by 2015 | 1 | Low Low N | No No | No Further water quality modelling is required to determine the extent of impacts within this catchment | 1 | | | | | | | | No measurable effects anticipated as a resu of changes in water quality due to new changes in | alt | | | Dischage of groundwater to surface water during construction has the potential to have a temporary impact the physico-chemical elements and therefore is assessed |
| | Dissolved orggen pt Phosphate | Numerical limits for classes Calculator available | High in 2015 High in 2015 Poor in 2015 | Good by 2015 Good by 2015 Moderate by 2027 | 1 1 1 2 | Low Low N Low Low N Low N | No No No No No | No No No | 1 1 1 1 | | | | | | No measurable effects anticipated as No res | | | No measurable effects anticipated as result of changes in INNS present in the | | | |
| | Temperature | Numerical limits for classes | | Good by 2015 | 1 | Low Low N | No No | No | 1 | | | | | | result of changes in flow and velocity of | changes in sedimentation deposition | existing discharge of surface water in surface water body | nto surface water body | | | to be a minor localised effect. No measurable effects anticipated |
| Specific pollutants | Mecoprop | | | | 0 | Low Low Poss | sible Possible | Possible | 0 | | | | | | | | | | | | as a result of changes in water quality |

| Return to top of the page | | | | | | | | | | | | | |
|--|--------|--|--|--|--|----------------------------|---------------|---|-------------------------------------|--|--------------------|---|--|
| RNAG/PoM/SERWAM | M | Relevant WFD Quality Element (RNAG) / Measure category 1 (PaM) | Category (RNAG)/Lead organisation (PoM | National Swmi Header (RNAG) / Title (PoM) | is this measure potential impacted by the scheme? (Yes/No) | Impact score assessment | Data confiden | Assist attain of wa body object | nent er Impediment to GES/GEP | Comprom ses water body objectives | Mitigation applied | Post mitigation impact score (- 2 to 3) | Note: Marga columns if activity appears multiple times New impounding reservoir (in line/next to watercourse, or large compared to watercourse) - excluding abstraction/discharge |
| Reasons for Not Achieving Good (RNAG) | 486198 | Phosphate | No sector responsible | Pollution from waste water | No | | | | | | | | |
| Reisons for Not Achieving Good (RNAG) | 486196 | Phosphate | Water Industry | | No | | | | | | | | |
| Reasons for Not Achieving Good (RNAG) | 520646 | Macrophyles and Phytobenthos Combined | Water Industry | Pollution from waste water | No | | | | | | | | |
| Reisions for Not Achievine Good (RNAG) | 520790 | Fish | Aericulture and rural land management | Physical modifications | Yes | o | Low | ow N | No No | No | None | | Presence of a new physical modification (reservoir) is largely |
| | | | | | Yes | 0 | Low | ow N | No No | No | None | | located away from the watercourse and is not expected to conflict with waterbody scale measures to reduce modifications |

| Option | 528-41 | Go to 664/G/FeAt table at bottom of the page | ٦ | | | | | | | | | | | | | | | | | | |
|--|---------------------------------|--|-----------------------------------|--|--|--|--|--|--|--|---|---|---|---|---|--|---|--|---|---|---|
| | GB105030056515 | | | | | | | 1 | | New impounding reservoir (in line/heat to watercou | ns, or large compared to watercourse) - excluding abstra | dan/duharye | | Maintenance of pipe | lines (including draining pipeline) | | Nine pipe lines involving watercourse | -crossings with no in channel modifications | New WTW (| at back from a watercourse) | Below ground structures (shalt/rintaining wall) with |
| Waterbody name | | | | | | | | Construction. Operation or Decommissioning | activity | Coe | enuction and operation | | | | Operation | | Contract | on and governion | 1 | Construction | associated dewatering |
| | Swaton Drains | | | | | | | Patential Impacts of secun (following o | | | | | | T | | 1- | | | | Change in water quality due to new or changes to | |
| Hydromorphological designation Overall status | Newly Modified Madense | | | | | | | embedded mitgrator) mydromorphological supporting elements | , | √ · | Consigns to make versionly and white the processor of the consistence | Changes to water body hydromosphology leads changes in river processes and habitats upon and downstream | х | X X | contage invalent output to an orient at coalge of withing discharge of surface water into surface water body X | X | J | Change to water coay repronouncing years changes in Price processes and habitors updre and downstream | × | disc ¥ | Change is water quality due to discharge of groundwater to a surface water body |
| Overain statut dojective | 5000 By 1921 | | | | | Doesobje | the component comply with 1 tives (post midgation) | Physician shares | x | x x | x | х х | · · · · · · · · · · · · · · · · · · · | , | , | , | x | x | · · · · · · · · · · · · · · · · · · · | · · | × × |
| | | | | | | School States | (10,000 and 10,000 and | 94/22 | order o | | | | | | | | | | | | |
| WFD status Component | WFD quality element | Method of checking compliance | Classification | Objective | a Dedau | Don cod | MATERIA DE PREPARENTE SE CARRESTEE | Mildgarton applied | Section 2007 Comment of the impact of 'Changes to character and the element of the impact of 'Changes to character and the element of the impact of 'Changes to character and the element of the impact of 'Changes to character and the element of the impact of 'Changes to character and the element of the impact of 'Changes to character and the element of the element of the impact of 'Changes to character and the element of th | nelfoctplint on Commett of the Impact of Noi vibration on each element | ie and Comment of the impact of 'Changes in flow velo- valume (increase or decrease)' on each element. | Comment of the impact of 'Changes to water by and hydromorphology leading to changes in processes and habitors updateam and downed on each element | river and volume of the impact of Changes in flow velo- river and volume (increase or decrease) on each reant selement | oby Comment of the impact of "Noise and vibration each element | Comment of the impact of Change in water que from that so new or changes to existing discharge of surface water into surface water body on each element | Comment of the impact of 'Change in IMNS present in surface water body' on each element | Comment of the impact of 'Changes in sedimentation-deposition' on each element | Comment of the impact of 'Changes to water hydromosphology leading to changes in processes and habitats upstream and downer on each element | of the impact of Wolse and vibration and element | Comment of the impact of "Change in water quality of new or changes to existing discharge of surface water surface water body" on each element. | ue to Commerc of the Impact of 'Change is water quality due to discharge of groundester to a surface water bedy' on each element. |
| Biological quality elements | Muserlabrz es | Guidance document available | Good in 2015 | Good by 2015 | 2 | Low Low W | s You You | Any substantial watercourses should be realigned where appropriate. | The reservoir floorprint will result in a loss of 2.5km of open watercourse, and will effectly a considerate of the center of the control from will be control from the control | I approximately elysever the sixtencount at the six | Reservoir will be constructed over the bodgers of watercourse, effectively servering the besidesteen placed for watercourse, and results of appointments. This will result in of appointments of this continues to the property of appointment of the continues of the region adverse reduction in flow in the watercour would impost on the biological quality elements. | the heavest will be constructed over the footprint the watercourse, efficiently severing the heave from the from the lower reaches of the continues. This the lose in result in the lose of approximately 28% of the watercology continues describely lose themself the data as in reservoir. This would lead to an major adverse a, which induction in flow in the watercourse, which wa impact on hydromorphology and in turn on the impact on hydromorphology and in turn on the | of solars. No measurable effects anticipated to biological quality elements as a result of temporary and infrequent change in flow due to pipeline drainin | No measurable effects anticipated to biological quality elements us a result of temporary and enfrequent coice and vibration due to pipeline draining invertebrates likely to be insensitive to change. | No measurable effects antidipated to biological quality elements as a result of temporary and infrequent change in water quality due to pipelia draining | No measurable effects anticipated to biological quality elements as a result of temporary and infrequent discharges due to pipeline draining | No measurable effects articipated as a result changes in sedimentation deposition on at biological quality elements. At this tage it assumed construction will involve trenchle activities. | Mo measurable effects anticpated as a result of changes in hydromorphology on the biological quality elements. At this rage it is assumed construction will invoke trendless activities. | No measurable effects anticipated to biological quality elements as annual of noise and vibratio during construction of the new WWW Inversibility likely to be insensitive to change | n No measurable effects antidipated to biological qualities elements as a result of construction of the new WTM | Discharge of groundsster to surface water during construction has the gaterial to impact the grandfall tabilitat for biological quality elements and therefore this is assessed to be a minour localised effect. |
| | Wydrological Regime | | Nighlin 2015 | Supports Good by 2005 | | Low Low W | s Yes Yes | Any substantial watercourses should be easigned where appropriate. | Reservoir will be constructed over the footpreatment of will result in the loss of ago of the waterbody length within the content of the waterbody length within the waterbody length waterbody length within the waterbody length waterbo | riot of the growinately 28% ot: 1the coverance of No measurable effects anticipated which is successed in a result of noise and vibration | Reservoir will be constructed over the footprint of extensions, effectively several that handware lover resolves of the cathwared. This will be of 20% of the extended, carbones climbally of the several than will be and the several con- | biological quality elements. It has been the form the fittle loss enemath to measurable effects anticipated as a result of hydromorphology changes. | No measurable effects anticipated as a result of temporary and infrequent change in flow due to pipeline drawing | | | | | | | | Oschage of grandester to surface wore during construction has the patential to inpact the hydrodycological and otherwise is assessed to be a micro localised effect. |
| Hydromorphological/Supportin Diements | | | | | | | | | the readwarders from the lower crash-relect, to be amajor adverse impact on the hydrolog Reservoir will be constructed over the footpr watercourse, and will result to the loss of ago | gical regime. | enduction in flow in the watercourse, which would on the hydrological regime. Reservoir will be constructed over the bodgrint of watercourse, effectively severing the hashadoon watercourse, effectively severing the hashadoon watercourse of the continuent. This will result of approximately 20% of the waterchool yearshire | the Reservoir will be constructed over the footprint from the first watercourse, effectively severing the heads that leads from the footprint footprint the scanner. This construct This is result in the loss of approximately 20% of the | speline draining | | | | No measurable effects anticipated as a result of changes in sedimentation disposition on the hydrological regime and misigation measures assessment. At this stage it is surumed construction will involve trenchlers activities. | No measurable effects anticipated as a result of changes in hydromorphology on the hydrologica regime and mitgation measures assessment. As stage it is assumed construction will involve trenchless activities. | l thu | | Discharge of grandwater to surface water during |
| | Milligation Measure: Assessment | | Moderate or less in 2015 | Good by 3527 | | Low Low W | s Yes Yes | Any substantial watercourses should be easilgned where appropriate. | Resultation with the constructed do we the footpre- water.comes, and will result in the foot of page of the water.boy length widths the continues the water.boy length widths the continues the water.boy length width is the continues of which is blady to lead to a divergetion in their measures assessment. | nt. No measurable effects anticipated per diament, as a result of noise and vibration mitigation | directly lost beneators the reservoir. This would be enging radiovare reduction flow and therefore in the regime in the catchineast. Some impacts on the research due to flow changes may occur. | ato as Waveledon's data make disectly social enabled the greget to Terestro, "This would lead to an ingle adverse ligation reduction in flow and therefore changes to the july domographic legical in gione in the contine est. I impact on mitigation in essures due to undimentation changes may occur. | ione | | | | | | | | construction, is walkey to impact the migration measures seasoned. |
| | Ammonia jistali se Nj | | Mighin 2015 | Good by 2015 | 1 | Low Low N | o No No | | | | | | | | | | | | | | |
| | Dissolved owgen | Numerical limits for classes | Moderate in 2015 | Good by 3815 | 1 | Low Low N | o No No | | | | | | | | | | | | | | |
| Physico-chemical qualit elements | pa | | High in 2015 | Good by 2015 | | Low Low N | o No No | | | | | | No measurable effects anticipated as a result of changes in flow velocity and volume | the No measurable effects anticipated as a results of noise and vibration | the or changes to existing discharge of surface water surface water body | No measurable impact anticipated as a result of a fact change in IMAS present in the surface water body | | | No measurable impact anticipated on the physicochemicals as a result of noise and vibratio | No measurable impacts anticipated on the physico- chemicals as a result of changes to water quality. | Discharge of groundester to surface water during construction has the parential to impact the parential compact the principles of the parential compact the parential construction of the |
| | Phosphate | Calculator sviliable | Moderate in 2015 | Good by 3527 | 1 | Low Low N | o No No | | 1 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | Temperature | Numerical limits for classes | Moderate in 2015 | Good by 2015 | 1 | LOW LOW N | o No No | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| Return to too of the page | - | | | | | Doe | : the component comply with 1 | MFG) | Noos: Mege columns if activity appears multi- | pitple tines | | | | | | | | | | | |
| Strag Franchistan | id. | Relevant WFO Quality Element (NAME) / Measure category 1 | Category (MNAG)/Lead caranication | Son Probli Nazional Swmilleader (RNAG)/Tide (Pobl | a this measure sociated by the property of the | Amie stale s | tous Comp nee star star impediment to GES/GEP shiped | omi ser withsicon applied | Nost enligation impact scale impounding reservoir (in line/next to users command to untercourse! -excluding | NASHITEURS, OF | | | | | | | | | | | |
| Resource for Not Achieving Good (RNAG) | 532184 | (Pakt) Rydrological Regime | No sector responsible | No further action (Flow is below the SFI but NOT causing an ecological failure) | (me/No) E 8 | Eow Low N | o Yes Yes | Any substantial watercourses should be realigned where appropriate. | 2 to 2) abstraction/discharge | | | | | | | | | | | | |
| | | | | | | | | _ | | | | | | | | | | | | | |
| Reasons for Not Activing Good (RNAG) | ean and | Nydrological Regime | No sector responsible | No further action (Flow is below the GFI but NOT causing an ecological fallure) | t Virs | LOW LOW N | D Yes Ver | | | | | | | | | | | | | | |
| Reasons for Not Achieving Good (RNAG) | Cardal | Macrophytes and Physobenshos Combined | Agriculture and rural land manage | ement. Physical modifications | Nes 2 | Low Low N | o Yes Yes | | Meservoir will be constructed over the fact present of the section of the se | rist of the Stations to the stowersheets that | | | | | | | | | | | |
| Resident for Not Achieving Good (RMAG) | Sandak | Macrophysis and Physoberobic Combined | Water industry | Pollution from worde water | Ves 2 | Low Low N | S Yes Ver | | 3 | | | | | | | | | | | | |
| | 159495 | Macrophyses and Physobenthes Combined | Assistance and models | anace deliction from a | Ves 2 | low live live | | | , | in de | | | | | | | | | | | |
| Ressoon for Not Achieving Good (RNAG) | | | -gravese e and rural land manag | ement Poliution from nural areas | eri 2 | Low Low N | n Yes Yes | | 2 Reservoir will be constructed over the footpreastrocours, effectively severing the headward lover reaches of the customers. This will reach provide the substance This will reach provide a substance to the substance of the sub | ates from the wit in the loss of neet descrip last | | | | | | | | | | | |
| Passons for Not Achieving Good (RNAG) | 528820 | Macrophytes and Physobershox Combined | Agriculture and rural land manag | ement. Pollution from oursil areas. | Yes 2 | Low Low N | n Yes Yes | | 2 | | | | | | | | | | | | |
| | | | | | | Low Low N | | Any substantial watercourses chould be realigned where appropriate. Flow support release of water from the reservoir could be considered to support flows, but would need considered to support flows, but would need consideration of water quality. | | | | | | | | | | | | | |
| Resoons for Not Achieving Good (RNAG) | n.muodi | rmosphate | Water industry | Pollution from words water | Vec 2 | Low Low N | Nos. Ves | | beneath the reservoir. This would lead to an reduction in flow in the watercourse, leading of pollution, potentially leading to a reduction improvements that can be reade. | n major a devrse to less disution on in the | | | | | | | | | | | |
| Reasons for Not Achieving Good (RNAG) | 1528607 | Phosphate | Agriculture and rural land manag | ement Pollution from rural areas | Yes 2 | Low Low N | > Yes Ver | | 2 | | | | | | | | | | | | |
| | | | | | | | | - | | | | | | | | | | | | | |
| Resoons for Not Achieving Good (RNAG) | Sandak | Phosphate | Agriculture and rural land manag | ement. Pollution from nural areas | Yes 2 | Low Low N | o Nes Viel | | 2 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| Option | SLR 41 | Go to RNAG/PoM table at bottom of the page |
|--------------------------------|-----------------------------|---|
| | | |
| Waterbody ID | GB104028053110 | |
| | | |
| | | |
| Waterbody name | Trent from Soar to The Beck | |
| | | |
| Waterbody type | Roor | |
| | | |
| | | |
| Hydromorphological designation | Heavily Modified | Action: Obtain HMWB measures information from the Environment Agency to add to the RNAG/PoM table. |
| | | |
| Overall status | Moderate | |
| | | |
| | | |
| Overall status objective | Moderate by 2015 | |
| | | |
| | | |
| | | |
| | | |
| | | |

| Waterbody type | Blue Blue | | | | | | Date with Imports of over 16th or in considerati | | | Change in Case wheels and whomas | Changes in flow velocity and volume | | | Assess is codimentation | Change is collectation | Construction | Operation | Construction | Construction and operation | Operation | Operation | Operation |
|--|--|--|--------------------------|-----------------------|------------------------|--|--|--|---|---|---|--|---|--|--|--|--|---|--|---|--|---|
| wateroddy type | NO. | | | | | | Potential impacts of asset (relowing consideration) | in or embeloped | | Changes in flow velocity and volume (increase or decrease) | (increase or decrease) | | | Changes in sedimentation deposition | Changes in sedimentation deposition | | | to changes in water body nytromorphistogy wasti to changes in river processes and habita upstream and downstream | ts to charges in river processes and habits upstream and downstream | thange in water quality due to in the changes to existing discharge of si water into surface water body | Operation or Change in water quality due to new or changes to existing discharge of surface water into surface water body | er water body |
| Hydromorphological designatio | Meavily Modified | Action: Obtain HMWB measures information from the Environment Agency to add to the RNAG/Poht table. | | | | | Biological Effects | Changes to channel footprint ✓ | Changes to channel footprint | , | · · | Changes in flow velocity and volume (increase or decrease) | Changes in sedimentation deposition | 7 | Changes in r | edimentation deposition Noise and vibration | Noise and vibration | · | · · | / | , | · · |
| | | | | | | | | | | | | | | | | | | | | | | |
| Overall status | Moderate | | | | | | Hydromorphological supporting elements | 1 | * | , | 4 | 1 | 1 | х | 1 | 7 | х | 1 | · | х | , | х |
| Overall status objective | Moderate by 2015 | | | | | | Physicochemical Effects | х | | x | , | × | x | , | x | ✓ × | | × | x | , | , | J |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Does | the component comply with WFD (post mitigation) | bjectives Chemical effects | × | x | х | · | x | × | · · | x | x x | - | × | х | 1 | × | х |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | refidence certainty | s classes ts to GES/GI | 15-2 waster por 15-2 waster po | Comment of the impact of | Comment of the impact of 'Changes to channel footprint' on each element | Comment of the impact of 'Change | s in Comment of the impact of 'Changes in | Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element | Comment of the impact of 'Changes in sedimentation deposition' on each element | Comment of the impact of | Comment of the impact of Comment of | | of 'Noise and Comment of the impact of 'N | Comment of the impact of 'Changes to water body hydromorphology leading to changes in riv processes and habitats upstream and downstream' on each element | Comment of the impact of 'Changes to water ver body hydromorphology leading to changes in ri | Comment of the impact of 'Change in er quality due to new or changes to exis | water Comment of the impact of 'Change in water ring quality due to new or changes to existing | Comment of the impact of 'Change in |
| WFD status Component | WPD quality element | Method of checking compliance | Classification | Objective | Data co Design | statu Impedimen | 2 g Miltigation applied | Changes to channel footprint | on channel footprint on each element | flow velocity and volume (increase decrease) on each element | or flow velocity and volume (increase or decrease) on each element | (increase or decrease)" on each element | | | | | | | processes and habitats upstream and downstream' on each element | discharge of surface water into surface body' on each element | e water discharge of surface water into surface water body' on each element | INNS present in surface water body' on each element |
| | | | | | | | Further water quality modelling is required to | New intake structure anticip | ated New abstraction anticipated to have limit | ed Localised changes to flow velocity an | ound Temporary infrequent localised changes | Changes in flow and velocity caused by the new abstraction may have impacts downstream. It should be noted that intake is loca downstream from new outfall / discharge into the River Whiten It is assumed that it will abstract the same if not similar amount | Changes in flow volume and velocity as and a result of new intake could lead to | Temporary infrequent localised changes to flow | No measurable effects anticipated as a result of changes in sedimentation deposition on the biological quality elements. | flow volume and could change Potential temporary | disturbance Threath | ed New structure not anticipated to affect | No measurable effects anticipated as a result of changes in changes to the hydromorphology on | Temporary infrequent localised chang | Changes in water quality could occur due to the new abstraction due to changes in | Temporary infrequent discharges from pipeline maintenance unlikely to impact on INNS as pipeline would |
| | Invertebrates | Guidance document available | Good in 2015 | Good by 2015 | 2 Low Low Pos | sible Possible | Possible further water quality modelling is required to determine the extent of impacts within this catchment | effect on biological quelements | ated imal footprint, minimal effect on biological quality elements | intake expected to have minimal effe invertebrates | and Temporary infrequent localised changes ct on to flow velocity expected to have minimal effect on invertebrates | water as is discharged upstream. Despite this supporting flow, changes in local velocity and flow between the discharge and abstraction may still have an impact on biological quality element. | deposition which is anticipated to have minimal effect on the biological quality elements | sedimentation and expected to have minimal effect on invertebrates | No measurable effects artificipated as a recut of changes in sedimentation deposition on the biological quality elements. At this stage is assured construction methods will comprise of trenchless actitivies. habitet effe | of the abstraction, ead to changes in noise ing invertebrates. | noise unlikely to effect invertebrates | ed New structure not anticipated to affect hydromorphology up and downstream, minimal effect on biological quality elements | No measurable effects anticipated as a result of changes in changes to the hydromorphology on the biological quality elements. At this stage it i assumed construction methods will comprise of trenchless activities. | contain raw water from this waterboo impact anticapted on invertebrates | dilution. Further investigation is required to determine the potential impacts of biological quality elements. | contain raw water from this waterbody. No impact anticapted on invertebrates |
| Biological quality elements | | | | | | | | | | | | but to an uncertain extent. Further investigation is required. Changes in flow and velocity caused by the new abstraction may have impacts downstream. It should be noted that intake is local downstream from new outfall / discharge into the River Witham. | <u> </u> | | | | | | | | | Temporary infrequent discharges from |
| | Macrophytes and Phytobenthos Combined | Calculator available | Moderate in 2015 | Good by 2027 | 2 Low Low Pos | sible Possible | Further water quality modelling is required to determine the extent of impacts within this catchment | New intake structure anticip to have limited footprint, min effect on biological qualiforments | ated imal ality footprint, minimal effect on biological quality elements | Localised changes to flow velocity an intake expected to have minimal effe invertebrates | ound Temporary infrequent localised changes ct on to flow velocity expected to have minimal effect on invertebrates | It is assumed that it will abstract the same if not similar amount water as is discharged upstream. Despite this supporting flow changes in local velocity and flow between the discharge and abstraction may still have an impact on biological quality elemen | of a result of new intake could lead to localised changes in sediment deposition which is anticipated to have | localised changes to flow unlikely to effect sedimentation and expected to have minimal effect on | in sedimentation deposition on the biological quality elements. At this stage it is assumed | could change Potential temporary of the abstraction, invertebrates likely to | disturbance Semporary infrequent localis noise unlikely to effect invertebrates | ed New structure not anticipated to affect hydromosphology up and downstream, minimal effect on biological quality elements | No measurable effects anticipated as a result of changes in changes to the hydromorphology on the biological quality elements. At this stage it assumed construction methods will comprise or | Temporary infrequent localised chang water quality unlikely to as pipeline w contain raw water from this waterboo impact anticapted on inventebrates | changes in water quality could occur due to the new abstraction due to changes in diatrion. Further investigation is required to determine the potential impacts of biological | pipeline maintenance unlikely to impact on INNS as pipeline would contain raw water from this waterbody. No impact anticapted on |
| | | | | | | | | | | | | but to an uncertain extent. Further investigation is required. | | | | | | | | | quality mentions. | invertebrates |
| | Hydrological Regime | | Supports Good in 2015 | Supports Good by 2015 | 1 Low Low Pos | sible Possible | It is assumed best practice design will be implemented for the intake structure. Further investigation is required to determine the extent impacts. | It anticipated there will be m effects on the hydrological reg | namat it anticipated there will be minimal effects ime. the hydrological regime. | son Minor localised impacts are expects the hydrological regime due to the ch in flow velocity and volume rates result of the intake | of on Temporary infrequent discharges are large anticipated to have minimal effects on as a the hydrological regime. | Minor impacts are expected on the hydrological regime due to t change in flow velocity and volume rates as a result of the abstraction. | Potential increased sedimentation due abstraction not expected to have significant effect on the hydrological regime | 50 | No measurable effects Potential in articipated as a result of due to abstrohanges in sedimentation have signific deposition on the hydrological hydrological | eased sedimentation No measurable impaction not expected to the hydrological regiment effect on the regime | entropated on | New structure not anticipated to affect hydromorphology up and downstream, no effect on hydrological regime | No measureable effects anticipated as a result of changes in changes to the hydromorpholo | it Y | No measurable impact anticipated on the hydrological regime | |
| Hydromorphological Supportin Elements | | | | | | | | | | | | Changes in flow and velocity unlikely to significantly affect ph modifications pressure | rysical Potential increased sedimentation due | to | measures assessment. At this Potential in | wased sedimentation No measurable impac | anticpated on | New structure not anticipated to affect hydromorphology up and downstream, no effect | construction methods will comprise of trenchle | n ss | No measurable impact anticipated on ti mitigation measures assessments | the |
| | Mitigation Measures Assessment | | Moderate or less in 2015 | Good by 2027 | 1 Low Low 7 | No No | It is assumed best practice design will be implemented for the intake structure. At the nex stage, the mitigation measures assessment will need to be requested. | structure increasing the physic modification pressures. | Minor localised impacts are anticipate due to the intake structure increasing that physical modification pressures. | modifications pressure | | | abstraction not expected to have significant effect on mitigation measure | ns. | stage it is assumed construction due to abstr methods will comprise of trenchless actitivies. measures | ent effect on mitigation | | hydromorphology up and downstream, no effect on the mitigation measures assessment. | construction methods will comprise of trenchil activities. | | The state of the s | |
| | Arrmonia (total as N) | | High in 2015 | Good by 2015 | 2 Low Low Unc | ertain Uncertain | hicertain | 2 | | | | | | | | | | | | | | |
| | Biochemical oxygen dernand | Numerical limits for classes | Good in 2015 | No data available | 2 Low Low Hee | ertain Uncertain | ancertain | 2 | | | | | | | No measurable effects | | | | | | | |
| | | | | | | | | | | | | | | | anticipated as a result of changes in the sedimentation deposition on the | | | | | | Changes in water quality due to new | |
| | Dissolved anggen | Numerical limits for classes | Good in 2015 | Good by 2015 | 2 Low Low Unc | sertain Uncertain | Ancertain | 2 | | | | | | No measurable effects anticipated as a result of change | | | | | No measurable effects anticipated as a result of changes to the hydromorphology on the physicochemcial elements. At this stage it is | | abstraction has potential to affect physico-chemical conditions, effects uncertain and would be | |
| Physico-chemical quality elements | | | | | | | Further water quality modelling is required to | | It anticipated there will be minimal effection | s. | No measurable effects anticipated as a result of changes in flow velocity and | | | in the | No measura a result of d sedimentati | ele effects anticipated as anges in the n | No measurable effects anticip as a result of changes in the r and | pated moise | physicochemical elements. At this stage it is assumed | No measurable effects anticipated as of changes to water quality on the ph | subject a result | No measurable effects anticipated as a result of changes in INNS present on the |
| | pH | | High in 2015 | Good by 2015 | 2 Low Low Unc | ertain Uncertain | determine the extent of impacts within this catchment | 2 | the physico-chemical elements | | volume on the phylisco-chemicals | | | sedimentation deposition on th phylisco-chemicals | e deposition o | n the phylisco-chemicals | vibration on the phylisco-cher | mcials | construction methods will comprise of trenchle activities. | s chemcials | to further assessment | physico-chemical elements |
| | Phosphate | Calculator available | Poor in 2015 | Moderate by 2027 | 2 Low Low Unc | ertain Uncertain | Incertain | 2 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | Température | Numerical limits for classes | Moderate in 2015 | Good by 2015 | O Low Low 9 | No No | No | 0 | | | | | | | | | | | | | No measurable effects anticipated | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | Acid Neutralising Capacity | Numerical limits for classes | High in 2015 | Good by 2015 | 0 Low Low | No No | No None required. | 0 | | | | | | | | | | | | | | |
| Priority hazardous substances | Anthracene | EQS directive | Good in 2015 | Good | 0 Low Low F | No No | No None required. | 0 | | | No measurable effects anticipated as a result of changes in flow velocity and volume on priority hazardous substance | | | No measurable effects anticipated as a result of change | | | No measurable effects antici as a result of changes in nois | pated in and | | No measurable effects anticipated as of changes in water quality on pri | a result | |
| | | | | | | | | | | | volume on priority hazardous substances | | | in sedimentation deposition o priority hazardous substances | se | | vibration on priority hazars substances | dous | | of changes in water quality on pri hazardous substances | | |
| | Benzo (b) and (k) fluoranthene | EQS directive | Good in 2015 | Good | O Low Low | No No | No None required. | 0 | | | | | | The state of the s | | | | | | | | |
| | Benzo (ghi) perelyene and indeno (123 <d) pyrene<="" td=""><td>EQS directive</td><td>Good in 2015</td><td>Good</td><td>O Low Low 1</td><td>No No</td><td>No None required.</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></d)> | EQS directive | Good in 2015 | Good | O Low Low 1 | No No | No None required. | 0 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | Benzo(a)pyrene | EQS directive | Good in 2015 | Good | 0 Low Low P | No No | No None required. | ۰ | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | Brominated diphenylether (BDPE) Calc | EQS directive | Good in 2015 | Good | 0 Low Low F | No No | No None required. | • | | | | | | | | | | | | | | |
| | Cadmium and its Compounds | EQS directive | Good in 2015 | Good | 0 Low Low P | No No | No None required. | 0 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | Hexachlorobenzene | EQS directive | Good in 2015 | Good | 0 Low Low F | No No | No None required. | ۰ | | | | | | | | | | | | | | |
| | Hesachlorobutadiene | EQS directive | Good in 2015 | Good | 0 Low Low | No No | No None required. | 0 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | Mexachlorocyclohexane | EQS directive | Good in 2015 | Good | 0 Low Low P | No No | No None required. | ۰ | | | No measurable effects anticipated as a | | | No measurable effects anticipated as a result of change | | | No measurable effects antici | pated | | No measurable effects anticipated as | a result | |
| | | | | | | | | | | | No measurable effects anticipated as a result of changes in flow velocity and volume on priority hazardous substances | | | anticipated as a result of change in sedimentation deposition o priority hazardous substances | on on | | as a result of changes in nois vibration on priority hazan substances | dous | | of changes in water quality on pris hazardous substances | | |
| | Mercury and its Compounds | EQS directive | Good in 2015 | Good | 0 Low Low F | No No | No None required. | 0 | | | | | | | | | | | | | | |
| | Negylphinal | EQS directive | Good in 2015 | Good | O Low Low F | No No | No None required. | 0 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | No measurable effects anticipated as a | | | No measurable effection anticipated as a result of change in sedimentation deposition of | ts es | | No measurable effects antici | pated | | No measurable effects anticipated as | a result | |
| Priority substances | 1,2-dichloroethane | EQS directive | Good in 2015 | Good | 0 Low Low 9 | | No None required. | 0 | | | No measurable effects anticipated as a result of changes in flow velocity and volumne on priority substances | | | priority substances | | | as a result of changes in and vibration on pr substances | | | of changes in water quality on pri substances | rity | |
| | Benzine | EQS directive | Good in 2015 | Good | 0 Low Low | No No | No None required. | · | | | No measurable effects anticipated as a result of changes in flow velocity and volumne on priority substances | | | No measurable effects anticipated as a result of change in sedimentation deposition of priority | es co | | No measurable effects antici as a result of changes in and vibration on pr substances | pated noise riority | | No measurable effects anticipated as of changes in water quality on pri substances | a result uity | |
| | | | | | | | | | | | | | | priority | | | | | | | | |

| | m | EQS directive | 0 | | | | None required. 0 | No measurable effects anticipated as a | | No measurable effects anticipated | No measurable effects anticipated as a result |
|---------------------|------------------------------------|---------------|--------------|------|---------------|-------|------------------|---|--|--|--|
| | Chicopyrios | стр эцести | Good in 2015 | ucos | U LOW LOW NO | NO NO | none requires. | no melatrative errors encogened as a result of changes fine wiscolety and volumes on priority substances | No measurable effects anticipated as a result of changes in sedimentation deposition on priority | NO THEOREM 2018 STREETS ATTO-SPEED as a result of danges in noise and vibration on priority substances | of final-plane enterin interplane in a Prince of Guerry and Control of Contro |
| | Dichloromethane | tQS directive | Good in 2015 | Good | 0 Low Low No | No No | None required. | No measurable effects anticipated as a result of changes in flow velocity and volumes on priority substances | No measurable effects anticipated as a result of changes in sedimentation deposition on priority | No measurable effects anticipated in a result of changes in noise and vibration on priority substances | No research effects of an investigation of an execution of changing on water quality or priority indicates the changing in adultion on the changing in the cha |
| | Fluoranthene | EQS directive | Good in 2015 | Good | 0 Low Low No | No No | None required. | No measurable effects enticipated as a result of changes in flow velocity and volumes on priority substances | No measurable effects anticipated as a result of changes in sedimentation deposition on | No measurable effects anticipated on a result of charges in noise and vibration on priority substances | No resourcible effects enliquied as a resol of charges submirrors advances |
| | Lead and its Compounds | EQS directive | Good in 2015 | Good | O Low Low No | No No | None required. | No measurable effects articipated as a result of changes in flow velocity and volumne on priority substances | n to measurable effects enticipated as a result of changes on sedimentation deposition on | No measurable effects anticipated in a result of changes in noise and vibration on priority substances | Too manuscrable effects writingshed as a result of disease or many and an arrange of the second of disease or many and private private or manuscrable or man |
| | Nickel and Its Compounds | EQS directive | Good in 2015 | Good | O Low Low No | No No | None required. | No measurable effects anticipated as a result of changes in flow velocity and volumes on priority substances | No measurable effects anti-panel as a result of charges on sedimentation deposition on | No measurable effects anticipated as a result of charges in noise and shoaton on promby substances | Two measurable effects onlyoped as a reach of changes were properly or provide a change of changes or water provide properly or provide and changes of changes or cha |
| | Pentachlorophenol | EQS directive | Good in 2015 | Good | 0 Low Low No | No No | None required. | No measurable effects anticipated as a result of changes in flow velocity and volumne on priority substances | priority No measurable effects Intriguede as a result of changes In Indian deposition on | No measurable effects anticipated as a result of charges in note and situation on priority substances | No removable effects and regularl as a resolu- of changes waters begand or priority whitevers |
| | Trichlorobenzenes | EQS directive | Good in 2015 | Good | O Low Low No | No No | None required. | No measurable effects anticipated as a result of changes in flow velocity and volumes on priority substances | priority No messarable effects anticipatelle arend of charges in sedimentation deposition on | No measurable effects enricipated as a result of changes in noise and vibration on priority substances | Non-manuscribe effects antiquipment on a result of changes in when required, proprietly authorized. |
| | Trichloromethane | EQS directive | Good in 2015 | Good | O Low Low No | No No | None required. | No measurable effects anticipated as a result of changes in flow-velocity and volumes no printly subtraces | priority No measurable effects anticipated as a result of changes in | No measurable effects anticipated as a result of charges in noise and violation on priority | No resourced effects deligibled as a result of Company administration of efficiency administration of efficiency |
| | Arsenic | | High in 2015 | High | O Low Low No | No No | None required. 0 | No measurable effects enticipated as a result of changes in flow volicity and volume on specific polishans. | udimentation deposition on privally privally desired and privally desired enforced as in a value of changes in undimentation deposition on | substances No messurable effects intricipated as a result of changes in noise and vibation on specific | To measurable effects enticipated as a reset of changes in value quality on speech |
| | Copper | | High in 2015 | High | 0 Low Low No | No No | None required. | No measurable effects anticipated as a result of channes in flow | deposition on the constraint affects are constraint affects are constraint affects disappe to address deposition on | poliularib No messurable effects anticipated as a result of changes in noise and viburion on specific | The measurable effects anticipated as a result of changes in souther quality on specific |
| | lron | | High in 2015 | Migh | 0 Low Low No | No No | None required. | volicity and volume on specific policiants No measurable effects anticipated as a result of changes in flow | | and vibration on specific polisions of specific polisions of specific polisions of specific anticipated as a result of charges in noise | periodic films periodic films periodic a supple of the periodic films periodic a supple of the periodic supple supple of the periodic supple supple supple of the periodic supple supp |
| | Manganese | | High in 2015 | High | O Low Low No | No No | None required. | wilcoty and volumne on specific pollutants | No measurable effects articular as a rout of changes on underection deposition on the change of the | and vibration on specific pollutants No measurable effects anticipated | politicarios No messaciales effects anticipated as a result |
| Specific pollutants | Tetrachloroethylene | | Good in 2015 | Good | 0 Low Low No | No No | None required. | to researche effects antiqued as a result of large in the volcity and volumes on specific problems To researchis effects antiqued To researchis effects antiqued | No measurable effects articular as a rout of changes on undersection department on the control of the control o | as a restut of changes in noise and viburition on specific pollutants No measurable effects anticipated | of changes in motor quality on operate pollutions To measurable effects anticipated as a result |
| | | | | | | | | as a result of changes in flow velocity and volumne on specific pollutants | antiquete as a must of charges in sedimentation deposition on the charges in sedimentation deposition on the charge of the charg | as result of changes in roles and shortion on specific pollutants No measurable effects anticipated | of changes in water quality on specific performance. |
| | Lame | | nga m2005 | | O Low Low No. | No No | None required. | No messivale effects articipated as a result of Canage in flow velocity and volumes on other chemicals | anticipated as a result of changes in in sedimentation deposition on other | as a result of changes in noise and vibration on other chemicals | The measurable efficient as ready and the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the se |
| Other chemicals | Aldrin, Dieldrin, Endrin & Isodrin | EQS directive | Good in 2015 | Good | O Low Low No | No No | None required. | No mesurable effects articipated as a result of Canaps in flow velocity and volumes on other chemicals | No mesurable effects anticipated as a result of changes in undimensation deposition on other | No measurable effects enticipated as a result of changes in noise and vibration on other chemicals | The measurable effects of a result of the property of the control of the control outside on other diseases. |
| | Carbon Tetrachloride | EQS directive | Good in 2015 | Good | 0 Low Low No | No No | None required. | No mesorable effects enticipated as a result of changes in flow velocity and relument on other chemicals | No mesurable effects and control of charge and control of control | to mesocials effects enfoqued in a result of change in role and effects on other change in the | No measurable this subspaced as a resul- of changes in water quality on other diseases. |
| | DOT fotal | EQS directive | Good in 2015 | Good | O Low Low No | No No | None required. 0 | No measurable effects intropoled as a result of changes in flow velocity and columns on other chemicals | No measurable effects entropieded as a result of changes in is sedimentation deposition on other | No mesurable effects enticipated as result of charge in rolar and vibration on other chemicals | Membranishe in water quality on other observable water quality on other observable. |
| | Trichloroethylene | EQS directive | Good in 2015 | Good | O Low Low No | No No | None required. | No measurable effects intriputed as a result of charges in flow velocity and volumes on other chemicals | No measurable effects anticipated as a result of changes in a sedimentation deposition on other | No measurable effects anticipated as a result of changes in noise and vibration on other chemicals | The manufacture of the manufacture of a second of changes in wader quality on other changes in the changes of the manufacture o |
| | | | | | | | | | | | |

Operation Operation
Changes in flow velocity and volume (Increase or decrease)

×

| Return to top of the page | | | | | | | | | | | | | | | |
|---|--------|--|---|--|--|----------------------------|----------------|--------------|-----------------------------------|---|---|--------------------|--|--|---|
| кнас/Ром/ничим | ы | Palevant WFD Quality Element (IPAKS) / Measure category 1 (PoN | Category (RNAG)/Lead organisation (PoM) | National Swmi Header (RNAG) / Title (PoM) | is this measure potential impacted by the scheme? (Yes/No) | Impact score assessment | Data confidenc | Design certa | Assists attainment of water | temporent comply with WFD Impediment to GES/GEP | Compromi ses water body objectives | Mitigation applied | Post mitigation impact scor (- 2 to 3) | Note: Merge columns if activity appea New or modified pumping station and/or river intake | |
| Reasons for Not Achieving Good | | | | | | | | | | | | | | | |
| ORNA Reasons for Not Achieving Good ORNA | | | Navigation Urban and transport | Physical medifications Physical medifications | No Yes | 1 | Low | Low | No | No | No | | 1 | New intake structure will be constructed in the footprint of the watercourse, introducing new physical modifications to the waterbody. | |
| Reasons for Not Achieving Good (INA. | 531096 | Mitigation Measures Assessment | Local and Central Government | Physical modifications | Yes | 1 | Low | | | No Uncertain | No Uncertain | | 1 | However, this is a minor change to the physical structure with minor potential to affect other scheme to improve modification status | Reduction in flow from new abstraction |
| Reasons for Not Achieving Good | 531034 | Macrophytes and Phytobenthos Combined | Water Industry | Pollution from waste water | Yes | | Low | | | Uncertain | Uncertain | | 2 | | records in now make actuation in the actuality in the river, leading to a reduction in the improvements that can be made to water quality. Further |
| Reasons for Not Achieving Good | | Phosphate | Water Industry | Pollution from waste water | | 2 | | | 0 | undrum | GILITAN | | 1 | | can be made to water quarty, Further investigation needed to understand impacts on water quality. |

| Waterbody ID | GB105030056780 | | | | Activity | | | | | | |
|-----------------------------|---------------------------------|---|---|---|---|--|---------------------------------------|---|---|---|---|
| | | | | | | | Ma | intenance of pipe lines (including draining | g pipeline) | | |
| aterbody name | Witham - conf Cringle Bk to con | f 3rant | | | Construction, Operation or Decommissioning activity | Operation | Operation | Operation | Operation | Operation | Operation |
| aterbody type | River | | | | Potential impacts of asset (following consideration of embedded mitigation) | Changes in flow velocity and volum (increase or decrease) | e Changes in sedimentation deposition | on | Change in water quality due to new or changes to existing discharge of surface water into surface water | Change in INNS present in surface water body | e Changes to water body hydromorphology lea changes in river processes and habitats upstread downstream |
| | | | | | | | | Noise and vibration | | | |
| dromorphological designatio | | Action: Obtain HMWB measures information from the Environment Agency to add to the RNAG/PoM | | | Biological Effects | 1 | 1 | * | * | * | * |
| erall status | Moderate | | | | Hydromorphological supporting elements | 1 | x | * | × | × | 1 |
| erall status objective | Moderate by 2015 | | | | Physicochemical Effects | 1 | 1 | 1 | 7 | x | - |
| | | | | | | | | | | | |
| | | | • | Does the component comply with WFI objectives (post mitigation) | Chemical effects | х | х | х | , | × | х |

| WFD status Component | WFD quality element | Method of checking compliance | Classification | Objective | Impact score | Data confidence Design certainty | percentages classes classes timpediments to | Compromises water body objectives | Mitigation applied | Post mitigation impact score | Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element | Comment of the impact of 'Changes in sedimentation deposition' on each element | Comment of the Impact of 'Noise vibration' on each element | Comment of the impact of 'Change in water quality due to new or changes to existing discharge of surface water into surface water hody' on each element | in INNS present in surface water body' on each element | e Comment of the impact of 'Changes to water body hydromorphology leading to changes in river processe and habitats upstream and downstream' on each element | into surface water body' on each element | Comment of the impact of 'Change in INN's present in surface water body' on each element | Comment of the impact of 'Changes in sedimentation deposition' on each element | Comment of the impact of 'Changes in flow velocity and volume (increase or decrease)' on each element | Comment of the impact of 'Changes to channel footprint' on each element | Comment of the impact of 'Changes to water boo hydromorphology leading to changes in riv processes and habitats upstream and downstread on each element | Comment of the impact of 'Changes' in sedimentation deposition' on each element |
|--|--------------------------------|-------------------------------|--------------------------|-----------------------|--------------|-------------------------------------|--|--------------------------------------|---|---------------------------------|--|--|--|---|--|--|--|---|---|--|--|--|---|
| Biological quality elements | Fish | | Good in 2015 | Good by 2015 | 2 | Low Low Po | ssible Possible | Possible | INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham. Further water quality modelling is required to determine the extent of impacts within this catchment | 2 | Temporary infrequent localised changes to flow velocity expected to have minimal effect on fish | Temporary infrequent localised changes to flow unlikely to effect sedimentation and expected to have minimal effect on fish | Temporary infrequent localise noise unlikely to effect fish as the will move away from the sourc of the noise | d Temporary infrequent localised changes to water quality unlikely to impact on fish | Temporary infrequent discharge from pipeline maintenance coul lead to introduction of INNS a pipeline would contain raw wate from another waterbody. | is did in Dischage of water into River Witham may lead to re- location changes in sedimentation patterns and (buthymetry). This could be impactful to fifth and inventibrates due to changes in habitat | The source of the water from the River Trent is expected to decrease the water quality into the River Witham. It is anticipated there will be an amber adverse impact to fish and invertebrates. Further | The water sourced from the River Trent and will be treated for INNS to ensure no INNS transfer into the River Witham. | Discharge of water into River Witham may lead to localized changes in sedimentation patterns and bathymetry. This could lead to changes in habitat in | Changes in flow and velocity caused by th new discharge may have impacts downstream. Changes in local velocity and flow between the discharge and abstraction may still have an impact on the biological quality elements, but to an uncertain extent, further | Impacts are expected to fish and invertebrates as a result of a new structure within the watercourse | No measurable effects anticipated as a result or changes in the hydromorphology on the biological quality elements. At this stage it is assume construction methods will comprise of | No measurable effects anticipated as if a result of changes in sedimentation deposition on the biological quality elements. At this stage it is assumed construction |
| | Invertebrates | Guidance document available | High in 2015 | Good by 2015 | 2 | Low Low Po | ssible Possible | Possible | INNS treatment has been provided between the River Trent abstraction and the transfer to the River Withau. Further water quality modelling is required to determine the extent of impacts within this catchment. | | | Temporary infrequent localised changes to flow unlikely to effect sedimentation and expected to have minimal effect on invertebrates | Temporary infrequent localised noise unlikely to effect invertebr | Temporary infrequent localised changes to water quality unlikely to impact on invertebrates | See INNS assessment for more details | invertebrates due to changes in habitat | investigation is required to fully understand the water quality in the discharge area. | | and fish | study suggests that increased flow could make barriers less passablefor fish species. | | | actitivies. |
| | Hydrological Regime | | Supports Good in 2015 | Supports Good by 2015 | 2 | Low Low Po | ssible Possible | Possible | catchment It is assumed best practice design will be implemented for the intake structure. Hydraulic modelling required to understand the impact of increased flow. | 2 | Temporary infrequent discharges are anticipated to have minimal effects on the hydrological regime. | | | | | No effects are anticipated on the hydrological regime | | No effects are anticipated on the hydrological regime | regime | Changes to flow velocity and volume: hydromorphology of the channel would b changed by additional flow in channel, altering channel processes and conditions such as water depth and | No effects are anticipated on th hydrological regime | No measurable effects anticipated as a result sedimentation on the hydrological regime. At the methods will comprise of trenchless actitivies. | of changes in hydromorphology or is stage it is assumed construction |
| Hydromorphological Support Elements | Mitigation Measures Assessment | | Moderate or less in 2015 | Good by 2027 | 2 | Low Low Po | ssible Possible | Possible | It is assumed best practice design will be implemented for the intake structure. At the next stage, the mitigation measures assessment will need to be requested. | 2 | | | | | | Changes in hydromorphology could lead to impacts on miligation measures assessment | | No effects are anticipated on the mitigation measure assessment | Changes in sedimentation could lead to impacts on mitigation measures assessment | Changes in flow and velocity unlikely to significantly affect physical modifications pressure | ninganon measures assessment of physical include assessment of physical modification (water industry). The new discharge outfall structure could potentially increase the physical modification pressures of this waterbody. | No measurable effects anticipated as a result of changes in hydromorphology on the mitigation measures assessment. At this stage it is assumed construction methods will comprise of trenchless actitives. | No measurable effects anticipated as a result of changes in sedimentation deposition on the mitigation measures assessment. At this stage it is assumed construction methods will comprise of trenchless actitivies. |
| | Ammonia (total as N) | | High in 2015 | Good by 2015 | | Low Low | Nes Yes | Yes | | 3 | | | | | | | In high level water quality assessment of the proposed marker from the Serve from the Serve from suggests there could be an increase in ammost concentration of Serve in this cutchement due to the reve transfer from the New Treet. When the server is the server is the server is the waterbody is composed as not performed to server the server is an approximation to Campil. The water quality review for the vertex pages to the 50 percent concentration of Jampils high states upon dataset learned or a risk of deterourbon from high to good status. I never the server is a risk of deterourbon from high to good status. I never the recognition of the private for server in a risk of deterourbon from high to good status. The contraction of the properties of server in processing the server is provided as the propert of server in processing the properties of processing the properties processing the processing the properties processing the properties processing the processing processing the processing processi | | | | | | |
| | Biochemical oxygen demand | Numerical limits for classes | High in 2015 | No data available | 1 | Low Low | No No | No | | 1 | | | | | | | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham, suggests that 800 could decrease by 13%. Further investigation is required to fully understand the impacts the discharge will have on the catchinent, but a reduction in 800 is expected to have no impact. | | | | | | |
| burrous bankal analih elemen | Dissolved oxygen | Numerical limits for classes | High in 2015 | Good by 2015 | 1 | Low Low | No No | No | Further water quality modelling is required to | 1 | No measurable effects anticipated as a result of changes in flow and | No measurable effects anticipated as a result of changes in sedimentation | No measurable effects anticips as a result of changes in noise | ated No measurable effects anticipated as and account of changes towards quality on | | No measurable effects anticipated as a result of changes in hydromorphology on the | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham, concludes there is an expected 1% decrease in dissolved oxygen by the time it reaches the Lower Witham - code (ringle 8 to conf frant catchment. Turber investigation is required to fully understand the impacts the discharge will have not be catchment. On a precautionary basis an will be catchment. On a precautionary basis an | No measurable effects anticipated as a result of changes in to the INNS on the physico- | f Minor localised impacts are expected to the | | | | |
| rysto-cremen quarry event | рH | | High in 2015 | Good by 2015 | 1 | Low Low | No No | No | determine the extent of impacts within this catchment | 1 | velocity on the physico-chemical elements | deposition on the physico-chemical elements | vibration on the physico-chen elements | No measurable effects anticipated as and a result of changes in water quality on inical the physico-chemical elements | | physicochemical elements | Cringle Bits comf Brant catchment. Further investigation is required to law junctions and the impact, the discharge will have on the statchment. On a precautiously basis and expressed reader from the Review Text to the Brant Witham, concludes there is an expected 1% increase in the by the time it restricts the Lower Witham conf. Cringle Bit to conf Brant catchment. Further investigation is revenited to fully understand the impacts the discharge will have on the catchment. On a precautiously waste an englighted impact is | chemical elements | physico-chemicals | | | | |
| | Phosphate | Culculator available | Moderate in 2015 | Moderate by 2015 | 3 | Low Low Po | ssible Possible | Possible | | 3 | | | | | | | In high hear further quality assument of the proceed manufacture of the first than the Wham, contained from the first than the Wham, contained from the first than the Wham, contained for the process of the contained than the contained for the contained than the contained from the contained than the contained from the contained from the Chillegia moderate and Colonial proof. This contained from the contained from the Chillegia moderate and Colonial proof. This contained from the contained from the Chillegia moderate and Colonial proof. This contemitation color to be pool medicated the country. A high been review of water washing that suggests that will be transfer in place connectations of prophets would further reventigation is required to this y understand the impacts the challegoe all have on the impacts the challegoe all have on the | | | | | | |
| | Temperature | Numerical limits for classes | Good in 2015 | Good by 2015 | 1 | Low Low | No No | No | | 1 | | | | | | | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham, concludes there is an expected 31 kincrase in temperature by the time it reaches the Lower Witham-conf Cringle list is one of farth catchinent. Further investigation is required to fully understand the impacts the displayment of the configuration of the procession of the configuration of the precautionary basis an negligible. No measurable effects anticipated as a result of | | | | | | |
| | Acid Neutralising Capacity | Numerical limits for classes | High in 2015 | Good by 2015 | | Low Low | No No | No | None required. | 0 | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised | | | changes from temporary infrequent localised pipeline discharges | | | | | | |
| Priority hazardous substance Priority substances | Nonylphenol | EQS directive | Good in 2015 | Good | Ö | | No No | | None required. | 0 | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | | | | | | |
| | Diuron | EQS directive | Good in 2015 | Good | Ö | | | No | None required. | 0 | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | | | | | | |
| Specific pollutants | Copper | | High in 2015 | High | 0 | Low Low | No No | No | None required. | O | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | | | | | | |
| | tron | | High in 2015 | High | 0 | Low Low | No No | No | None required. | 0 | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | | | | | | |
| Other chemicals | Zinc | | High in 2015 | High | 0 | Low Low | No No | No | None required. | 0 | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | | | | | | |

| Return to top of the page | | | | | | | | | Does the | he component comply | with WFD | | | |
|---|------|---|--|--|--|----------------------------|----------------|-----------------|---|-----------------------|--|---------------------|--|--|
| RNAG/PoM/HHWMM | Id | Relevant WFD Quality Element (RNAG) / Measure category 1 (PoM) | Category (RNAG)/Lead organisation | National Swmi Header (RNAG) / Title (PoM) | is this measure potential impacted by the scheme? (Yes/No) | Impact score assessment | Data confideno | Design certaint | Assists attainment of water body objective: | Impediment to GES/GEP | Comprom ses water body objectives | Militartion applied | Post mitigation impact score (2 to 3) | New discharge |
| Reasons for Not Achieving Good (RNAG) | | 36 Mitigation Measures Assessment | Agriculture and rural land management | Physical modifications | Yes | 1 | Low | Low | No | No | No | | | New intake structure will to constructed over the footprint in the watercourse, introducing new |
| Reasons for Not Achieving Good (RNAG) | 5310 | 36 Mitigation Measures Assessment | Local and Central Government | Physical modifications | Yes | 1 | Low | Low | No | No | No | | 1 | physical modifications to the waterbody, affecting other scheme to improve modification status |
| Reasons for Not Achieving Good (RNAG) | | 34 Phosphate | Water Industry | Pollution from waste water | Yes | 2 | Low | Low | No | Possible | Possible | | 2 | A high level water quality review suggests that the new discharg into this waterbody will increase |
| Reasons for Not Achieving Good (RNAG) | 1 | 34 Phosphate | Agriculture and rural land management | Pollution from rural areas | Yes | 2 | Low | Low | No | Possible | Possible | | | the phosphate concentration, potentially leading to a reduction in the improvements |
| Reasons for Not Achieving Good (RNAG) Reasons for Not Achieving | | | Agriculture and rural land management | Pollution from rural areas | Yes | 2 | Low | Low | No | Possible | Possible | | | that can be made to water quality. Further investigation into water quality needed |
| Good (RNAG) | 5288 | 20 inputs | 1 | Bennington STW | No | | | | | | | 1 | | |

| Option | SLR 41 | | So to RNAG/PoM table at hottom of | of the page | | | | | | | | | | | | | | | |
|-----------------------------------|--------------------------|------------------|---|--------------------------|-----------------------|--------------|-----------------|------------------|--------------------------------------|-----------------------------------|--|---------------------------------|--|--|--|---|--|--|---|
| Waterbody ID | GB105030062 | 70 | | | | | | | | | Activity | | | | | New transfer in t | ne watercourse | | |
| Waterbody name Waterbody type | Witham - conf | Brant to co | of Catchwater Drain | | | | | | | | Construction, Operation or Decommissioning activity Potential Impacts of asset (following consideration mitigation) | | Operation | Operation | | Operation | Operation Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream | Operation Change in water quality due to new or changes to existing discharge of surface water into surface water body | Operation |
| Hydromorphological des | gnation Heavily Modified | | Action: Obtain HMWB measures information from the | | | | | | | | Biological Effects | | Changes to channel footprint | Changes in flow velocity and volum | ne (increase or decrease) | Changes in sedimentation deposition | , | · · | Change in INNS present in surface water body |
| Overall status | Moderate | | Environment Agency to add to | | | | | | | | Hydromorphological supporting elements | | √ | | 1 | , | , | · | ~ |
| Overall status objective | Moderate by 2015 | | | | | | | | | | Physicochemical Effects | | · · | | х | 4 | 4 | · · · · · · · · · · · · · · · · · · · | ٧ |
| | | | | J | | | | | oes the compone | ent comply with | Chemical effects | | х | | х | х | х | , | х |
| WFD status Component | WFD quality element | | Method of checking compliance | Classification | Objective | Impact score | Data confidence | Design certainty | Deterioration between status classes | Compromises water body objectives | Mittigation applied | Post mitigation impact score | Comment of the impact of 'Changes to channel footprint' on each element | Comment of the impact of 'Change decrease)' on each element | rs in flow velocity and volume (increase o | r Comment of the impact of 'Changes is sedimentation deposition' on each element | Comment of the impact of 'Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream' on each element | Comment of the impact of 'Change in water quality due to new or changes to existing discharge of surface water into surface water body' on each element | Comment of the impact of 'Change in INNS present in surface water body' on each element |
| | Fish | | | Poor in 2015 | Good by 2027 | 2 | Low | Low P | ossible Possib | ole Possible | INNS treatment has been provided between the River Trent abstraction and the transfer to the River Witham. | 2 | | | | Changes in flow volume and velocity could | Changes in flow volume and velocity could change | Changes in water quality as a result of the discharge, has the potential for impacts on fish and invertebrates, already impacted by poor water quality. | |
| Biological quality ele | Invertebrates | | Guidance document available | Good in 2015 | Good by 2015 | 1 | Low | Low | No No | No | Further water quality modelling is required to determine the extent of impacts within this catchment | 1 | No effects are anticipated as a result of a channel in footprint | Changes in local velocity and flow in on biological quality elements, furt this. | n this waterbody may have an impact ther investigation is required to determi | change sedimentation pattern. This could be affect biological quality elements, furthe investigation would be required. | sedimentation pattern. This could affect biological of quality elements, further investigation would be required. | Changes in water quality as a result of the discharge, has the potential for impacts on invertebrates | The water sourced from the River Trent and will be treated for INNS to ensure no INNS transfer into the River Witham. |
| Hydromorphological Su Elements | | | | Supports Good in 2015 | Supports Good by 2015 | 2 | Low | Low P | ossible Possib | ole Possible | Hydraulic modelling required to understand the impact of additional flow on watercourse | 2 | No effects are anticipated on th hydrological regime | e would be changed by additional flo and conditions such as water depth | | Potential increase in sedimentation is not expected to have a significant effect on the hydrological regime. | Potential increase in sedimentation is not expected to have a significant effect on the hydrological regime. | regime | No effects are anticipated on the hydrological regime |
| | Mitigation Measures A | sessment | | Moderate or less in 2015 | Good by 2027 | 0 | Low | Low | No No | No | None required | 0 | No effects are anticipated on th mitigation measure assessment | e Changes in flow velocity and volum mitigation measures assessment | e will unlikely significantly affect the | Potential increase in sedimentation is not expected to have a significant effect on the mitigation measures assessment. | Potential increase in sedimentation is not expected to have a significant effect on the mitigation measures assessment. | measure assessment | No effects are anticipated on the mitigation measure assessment |
| | Ammonia (total as N) | | | н _е ф in 2015 | Good by 2015 | 3 | tow | Low P | ossible Possil | ole Possible | | а | | | | | | A high hew water quality assessment of the proposed transfer from the New Text to the River August 1 and 1 a | |
| | Biochemical oxygen de | nand | Numerical limits for classes | High in 2015 | No data available | 0 | | | | | | 0 | | | | | | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham suggests that there will be a decrease in Dissolved Oxygen of 2% due to the | |
| | Dissolved oxygen | | Numerical limits for classes | High in 2015 | Good by 2015 | o | Low | Low | No No | No | | 0 | | | | | | discharge from the River Trent into the upstream Witham (GB105030056780). Within this catchment, BOD levels are expected to be lower, however further investigation is required to determine the predicted %. On a precautionary | |
| Physico-chemical quality | ement s | | | High in 2015 | Good by 2015 | 1 | Low | Low | No No | No | Further water quality modelling is required to determine the extent of impacts within this catchment | 1 | No measurable impact anticipated on the physico-themcials as a result in the change in channel footprint | | | No measurable impact anticipated on the physico-thericals as a result in the change in sediment deposition | No measurable impact anticipated on the physicochemical as a result in the change in hydromorphology | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham suggests that there will be an increase in plut of 4% due to the discharge from the River Trent into the upstream Witham (BBJ05030056780). Within this catchment, pit levels are expected to be lower, however further investigation is required to determine the predicted %. On a precautionary basis a minor | No measurable effects anticipated as a result of changes in to the INNS on the physico-chemical elements. |
| | Phosphate | | Calculator available | Poor in 2015 | Moderate by 2027 | 3 | Low | Low | Yes Yes | Yes | | | | | | | | A high heel water quality assessment of the reproposed trainfer from the lews Treat to the River Within suggests that there will be an increase in hospitable of all oid, but to the design training to the control of the Within (ISI 05/0000/Figh. his waterbody is already at Prox testor for propulate and this increase in phospitate concentration could lead to a further worsening of this states dement. On a precoutionary basis a major adverse impact is repreted. | |
| | Temperature | | Numerical limits for classes | High in 2015 | Good by 2015 | 1 | Low | Low | No No | No | | 1 | | | | | | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham suggests that there will be an increase in temperature of 1% due to the discharge from the River Trent into the upstream Witham (IGB 105 30305 6750). Within this catchment, temperature is expected to be lower, however further investigation is required to determine the preciticed %. On a precautionary | |
| | Acid Neutralising Capa | ity | Numerical limits for classes | High in 2015 | Good by 2015 | 0 | Low | Low | No No | No | None required. | 0 | | | | | | basis a negligible impact is expected. No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | Benzo (b) and (k) fluora | nthene | EQS directive | Good in 2015 | Good | 0 | Low | Low | No No | No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | Benzo (ghi) perelyene a | nd indent (123-c | #N/A | an/A | WN/A | 0 | Low | Low | No No | . No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| Priority hazardous sub | tances Benzo(a)pyrene | | EQS directive | Good in 2015 | Good | 0 | Low | Low | No No | No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | Brominated diphenylet | ner (BDPE) Calc | EQS directive | Good in 2015 | Good | o | Low | Low | No No | No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | Cadmium and Its Comp | ounds | EQS directive | Good in 2015 | Good | 0 | Low | Low | No No | No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | Mercury and its Compo | unds | EQS directive | Good in 2015 | Good | 0 | Low | Low | No No | No No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | Nonylphenol | | EQS directive | Good in 2015 | Good | 0 | Low | Low | No No | No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| Specific pollutan | Triclosan | | | High in 2015 | High | 0 | Low | Low | No No | No | None required. | 0 | | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |

| Return to top of the page | 9 | | | | | | | | | component co WFD objectives | | | | |
|--|-------|--|---|--|---|----------------------------|-----------------|------------------|--|--------------------------------|--|--|--|--|
| RNAG/PoM/HHWMM | Id | Relevant WFD Quality Element (RNAG) / Measure category 1 (PoM) | Category (RNAG)/Lead organisation (PoM) | National Swmi Header (RNAG) / Title (PoM) | Is this measure potential impacted by the scheme? (Yes/No) | Impact score assessment | Data confidence | Design certainty | Assists attainme nt of water body objective | Impediment to GES/GEP | Comprom ises water body objective s | Mitigation applied | Post mitigation impact score (2 to 3) | New transfer in the watercourse |
| Reasons for Not Achieving Good (RNAG) | 53318 | 4 Mitigation Measures Assessment | Agriculture and rural land management | Physical modifications | No | | | | s | | | | | |
| Reasons for Not Achieving Good (RNAG) | 53318 | 6 Mitigation Measures Assessment | Local and Central Government | Physical modifications | No | | | | | | | | | |
| Reasons for Not Achieving Good (RNAG) | | 6 Phosphate | Water Industry | Pollution from waste water | Yes | 2 | Low | Low | No | Possible | Possible | | 2 | A high level water quality review |
| Reasons for Not Achieving Good (RNAG) | 53103 | 4 Phosphate | Agriculture and rural land management | Pollution from rural areas | Yes | 2 | Low | Low | No | Possible | Possible | | 2 | suggests that the new discharge into this waterbody will increase the |
| Reasons for Not Achieving Good (RNAG) | | 5 Phosphate | Agriculture and rural land management | Pollution from rural areas | Yes | 2 | Low | Low | No | Possible | Possible | Further water quality modelling is required to | | phosphate concentration, potentially leading to a reduction in the |
| Reasons for Not Achieving Good (RNAG) | 48623 | 9 Phosphate | Urban and transport | Pollution from towns, cities and transport | Yes | 2 | Low | Low | No | Possible | Possible | determine the extent of impacts within this catchment | 2 | improvements that can be made to water quality. Further investigation |
| Reasons for Not Achieving Good (RNAG) | 52860 | 77Fish | Agriculture and rural land management | Pollution from rural areas | Yes | 2 | Low | Low | No | Possible | Possible | | 2 | into water quality needed |
| Reasons for Not Achieving Good (RNAG) | 52882 | (Olich | No sector responsible | Non-native invasive species | No | | | | | | | | | |
| Reasons for Not Achieving Good (RNAG) | | | No sector responsible | Non-native invasive species | No | | | | | | | | | |
| Reasons for Not Achieving Good (RNAG) | | | | Physical modifications | No | | | | | | | | | |

| | SLR 41 | So to RNAG/PoM table at bottom of the page. |
|--------------------------------|---|---|
| Waterbody ID | GB205030062425 | |
| | Witham - conf Catchwater Drain to conf Bain | |
| Waterbody type | River | |
| Hydromorphological designation | Heavily Modified | Action: Obtain HMWB measures information from the Environment Agency to add to the RNAG/PoM table. |
| Overall status | Moderate | |
| Overall status objective | Moderate by 2015 | |
| | | |

| Waterbody name | Witham - conf Catchwater Drain to conf Bain | | | | | | | Construction, Operation or Decommissioning activ | vity | | | | | | |
|---|--|---|--------------------------|-----------------------|------------|--------------------------------------|---------------------------------|---|---------------|---|---|--|---|---|--|
| | | | | | | | | | | Operation | Operation | Operation | Operation | Operation | Operation |
| Waterbody type | River | | | | | | | Potential Impacts of asset (following consideration mitigation) | on of embedde | | Changes in flow velocity and volume (increase or decrease) | | Changes to water body hydromorphology leading to changes in river processes and habitats upstream and | Change in water quality due to new or changes to existing discharge of surface water into surface water body | |
| | | | | | | | | | | Changes to channel footprint | | Changes in sedimentation deposition | downstream | | Change in INNS present in surface water body |
| Hydromorphological designation | Heavily Modified | Action: Obtain HMWB measures information from the Environment Agency to add to the RNAG/PoM table. | | | | | | Biological Effects | | 1 | 1 | V | 7 | · | 1 |
| Overall status | Moderate | | | | | | | Hydromorphological supporting elements | | √ | √ | ~ | √ | · | √ |
| | | | | | | | | | | | | | | | |
| Overall status objective | Moderate by 2015 | | | | | | | Physicochemical Effects | | √ | X | √ | - | √ | √ |
| | | | | | | | | | | | | | | | |
| | | | | | | Does | s the component comply with WFD | Chemical effects | | Х | X | × | × | V | × |
| | | | | | | | objectives (post mitigation) | | | | | | | | |
| | 1 | | | | 9 | 2 4 8 | 9 h | | T ti | | | | | | |
| | | | | | 50 50 | ortain certain betwee | /GEP | ctives | impa | | | | Comment of the impact of 'Changes to water body | | |
| WFD status Component | WFD quality element | Method of checking compliance | Classification | Objective | E ST | ata co resign ration tus da | GES | Mitigation applied | tigation | Comment of the impact of 'Chan to channel footprint' on each | - Comment of the impact of Changes in flow velocity a | nd Comment of the impact of 'Changes sedimentation deposition' on each element | in hydromorphology leading to changes in river processe and habitats upstream and downstream' on each | Comment of the impact of 'Change in water quality due to new or changes to existing discharge of surface water into surface water body' on each | Comment of the impact of 'Change in INNS present surface water body' on each element |
| | | | | | | Deterio Sta | - Similar | Š | ost mi | element | | | element | element | |
| | | | | | | | | | - | | | | | | |
| | Fish | | Moderate in 2015 | Good by 2027 | 1 L | w Low No | No No | INNS treatment has been provided between the River Trent abstraction and the transfer to the | 1 | | Changes in local velocity and flow due to the transfer of | Changes in flow volume and velocity could change | | | |
| Biological quality elements | | | | | | | | River Witham. Further water quality modelling is required to | | No effects are anticipated as a result of a channel in footprint | water may still have an impact on biological quality elements, further investigation is required to determi | sedimentation pattern. This could affect | Changes in flow volume and velocity could change | Changes in water quality as a result of the abstraction, has the potential for minor localised impacts on fish and invertebrates | The water sourced from the River Trent and will be treated for INNS to ensure no INNS transfer into |
| | Invertebrates | Guidance document available | Good in 2015 | Good by 2015 | 1 b | w Low No | No No | determine the extent of impacts within this catchment | 1 | | this. | would be required. | elements, further investigation would be required. | | River Witham. |
| | | | | | | | | | | | | | | | |
| | Hydrological Regime | | Supports Good in 2015 | Supports Good by 2015 | 2 1 | w Low No | No No | Hydraulic modelling required to understand th impact of additional flow on watercourse | 2 | of a channel in footprint | ult Changes to flow velocity and volume: hydromorphology of the channel would be changed to | y to have a significant effect on the hydrological | d Potential increase in sedimentation is not expected to have a significant effect on the hydrological regime. | No effects are anticipated on the hydrological regime | No effects are anticipated on the hydrological regin |
| Hydromorphological Supporting | | | | | | | | | | | additional flow in channel, altering channel processe and conditions such as water depth and flow velocity | | | | |
| Elements | Mitigation Measures Assessment | | Moderate or less in 2015 | Good by 2027 | 0 L | W Low No | No No | None required | 0 | No effects are anticipated as a res of a channel in footprint | ult Changes in flow velocity and volume will unlikelly significantly affect the mitigation measures assessment | Potential increase in sedimentation is not expecte to have a significant effect on the mitigation | d Potential increase in sedimentation is not expected to have a significant effect on the mitigation measures | No effects are anticipated on the mitigation measure assessment | No effects are anticipated on the mitigation measu assessment |
| | | | | | | | | | | | | measures assessment. | assessment. | | |
| | | | | | | | | | | | | | | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham suggests that there will be an increase in | |
| | | | | | | | | | | | | | | ammonia of 7% due to the discharge from the River Trent into the upstream Witham (GB105030056780). Within this catchment, Ammonia | |
| | Ammonia (total as N) | | Good in 2015 | Good by 2015 | 3 L | w Low Possible | Possible Possib | ole | 3 | | | | | levels are expected to be higher, however further investigation is required to determine the predicted %. On a precautionary basis an amber adverse | |
| | | | | | | | | | | | | | | impact is expected. | |
| | | | | | | | | | | | | | | A high level water quality assessment of the proposed transfer from the | |
| | | | | | | | | | | | | | | River Trent to the River Witham suggests that there will be a decrease in BOD of 2% due to the discharge from the River Trent into the upstream | |
| | Biochemical oxygen demand | Numerical limits for classes | High in 2015 | No data available | 0 L | w Low No | No No | | 0 | | | | | Witham (GB105030056780). Within this catchment, BOD levels are expected to be lower, however further investigation is required to | |
| | | | | | | | | | | | | | | determine the predicted %. On a precautionary basis a negligible impact is expected. | |
| | | | | | | | | | | | | | | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham suggests that there will be a decrease in | |
| | Dissolved oxygen | Numerical limits for classes | Good in 2015 | Good by 2015 | 0 4 | w Low No | No No | | 0 | | | | | Dissolved Oxygen of 2% due to the discharge from the River Trent into the upstream Witham (GB105030056780). Within this catchment, BOD levels | |
| | | | | | | | | | | | | | | are expected to be lower, however further investigation is required to determine the predicted %. On a precautionary basis a negligible impact is | |
| hysico-chemical quality element | | | | | | | | Further water quality modelling is required to | | No effects are anticipated on the | | No effects are anticipated on the physicochemical | s No measurable impact anticipated on the | expected. A high level water quality assessment of the proposed transfer from the | No measurable effects anticinated as a result of |
| ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | | | | | determine the extent of impacts within this | | physico-chemicals as a result of a channel in footprint | | as a result of a changes to the hydromorphology | physicochemcials as a result in the change in hydromorphology | River Trent to the River Witham suggests that there will be an increase in pH of 4% due to the discharge from the River Trent into the upstream | changes in to the INNS on the physico-chemical |
| | pH | | High in 2015 | Good by 2015 | 1 L | w Low No | No No | | 1 | | | , , | , , | Witham (GB105030056780). Within this catchment, pH levels are expected to be lower, however further investigation is required to determine the | |
| | | | | | | | | | | | | | | predicted %. On a precautionary basis a minor localised impact is expected. | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | A high level water quality assessment of the proposed transfer from the River Trent to the River Witham suggests that there will be an increase in | |
| | Phosphate | Calculator available | Moderate in 2015 | Moderate by 2015 | 3 6 | w Low Yes | Yes Yes | | 3 | | | | | phosphate of 46% due to the discharge from the River Trent into the upstream Witham (GB105030056780). Within this catchment, Phosphate | |
| | | | | | | | | | | | | | | levels are expected to be lower, however further investigation is required to determine the predicted %. On a precautionary basis a major adverse | |
| | | | | | | | | | | | | | | impact is expected. | |
| | | | | | | | | | | | | | | A high level water quality assessment of the proposed transfer from the | |
| | - | N | Inch to 2005 | Sandhu 2005 | 1 6 | | No No | | | | | | | River Trent to the River Witham suggests that there will be an increase in temprature of 1% due to the discharge from the River Trent into the | |
| | remperature | Numerical limits for classes | High in 2015 | Good by 2015 | 1 | w Low No | NO NO | | 1 | | | | | upstream Witham (GB105030056780). Within this catchment, temperature is expected to be lower, however further investigation is | |
| | | | | | | | | | | | | | | required to determine the predicted %. On a precautionary basis a negligible impact is expected. | |
| | Acid Neutralising Capacity | Numerical limits for classes | High in 2015 | Good by 2015 | 0 L | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary | |
| | | | | | | | | | | | | | | infrequent localised pipeline discharges | |
| | Benzo (b) and (k) fluoranthene | EQS directive | Good in 2015 | Good | 0 L | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary | |
| | | | | | | | | | | | | | | infrequent localised pipeline discharges | |
| | Page (shi) accoluge and index (222 shi) | EOS dispetius | Cond in 2015 | Cond | | uu lou u | No No | Nonconstant | | | | | | No moneyable offers anticipated | |
| | Benzo (ghi) perelyene and indeno (123-cd) pyrene | EQS directive | Good in 2015 | 3000 | 0 L | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | | |
| | Benzo(a)pyrene | EQS directive | Good in 2015 | Good | , o r | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | | |
| | Brominated diphenylether (BDPE) Calc | EQS directive | Good in 2015 | Good | О г | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | missquent rotalised pipeline discharges | |
| | Cadmium and Its Compounds | EQS directive | Good in 2015 | Good | 0 L | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary | |
| | | | | | | | | | | | | | | infrequent localised pipeline discharges | |
| Priority hazardous substances | Endosulfan | EQS directive | Good in 2015 | Good | 0 L | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary | |
| | | - a secure | | | | NO | No No | None required. | , | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | | |
| | Hexachlorocyclohexane | EQS directive | Good in 2015 | Good | ,0 r | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | | |
| | Mercury and Its Compounds | EQS directive | Good in 2015 | Good | о <u>г</u> | w Low No | No No | None required. | 0 | | | | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | The receipt of physical discussions | |
| Priority substances | | | | | | | | | | | | | | | |

Construction, Operation or Decommissioning activity

| | Nonylphenol | EQS directive | Good in 2015 | Good | 0 | Low | Low No | No | No | None required. | 0 | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
|------------------|-------------------------------------|---------------|---------------|------|---|-----|--------|-----|----|----------------|-----|--|---|--|
| | | | | | | | | | | | | | intrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | |
| | Nickel and Its Compounds | EQS directive | Good in 2015 | Good | 0 | Low | Low No | No | No | None required. | 0 | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | |
| | Chlorothalonil | | High in 2015 | High | 0 | Low | Low No | No. | No | None required. | 0 | | No measurable effects anticipated as a result of changes from temporary | |
| | | | | | | | | | | | | | infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | |
| | Copper | | High in 2015 | High | o | Low | Low No | No | No | None required. | 0 | | No measurable effects anticipated as a result of changes from temporary | |
| | | | | | | | | | | | | | infrequent localised pipeline discharges | |
| cific pollutants | | | | | | | | | | | | | | |
| ecinc poliutants | Mecoprop | | High in 2015 | High | 0 | Low | Low No | No | No | None required. | 0 | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | illitequent localised pripeline discharges | |
| | | | | | | | | | | | | | | |
| | Pendimethalin | | High in 2015 | High | 0 | Low | Low No | No | No | None required. | 0 | | No measurable effects anticipated as a result of changes from temporary infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | |
| her chemicals | Aldrin, Dieldrin, Endrin & Isodrin | EQS directive | Good in 2015 | Cood | | Low | Low No | No | No | None required. | 0 | | No measurable effects anticipated as a result of changes from temporary | |
| nei chemicais | Aldrin, Dielarin, Eriarin & Isbarin | EQ3 directive | G000 III 2013 | 9000 | 0 | LOW | LOW NO | No | NO | None required. | · · | | infrequent localised pipeline discharges | |
| | | | | | | | | | | | | | | |

| Return to top of the pa | ge | | | | | | | | | Does ti | the component comply with objectives | n WFD | | | |
|--|----|--------|--|---|--|---|----------------------------|-----------------|------------------------|---|--------------------------------------|--|--|--|--|
| RNAG/PoM/HHWMM | Id | | Relevant WFD Quality Element (RNAG) / Measure category 1 (PoM) | Category (RNAG)/Lead organisation (PoM) | National Swmi Header (RNAG) / Title (PoM) | is this measure potential impacted by the scheme? (Yes/No) | Impact score assessment | Data confidence | esign certair m m m | Assists ettainme et of vater loody ebjective | Impediment to GES/GEP | Comprom ises water body objective s | | Post mitigation impact score (2 to 3) | New transfer within the watercourse |
| | | | | | | Yes | 2 | Low | Low s | | Possible | Possible | | 2 | |
| Reasons for Not Achieving Go (RNAG) | od | 517843 | Phosphate | Agriculture and rural land management | Pollution from rural areas | | | | | No | | | | | A high level water quality review |
| | | | | | | Yes | 2 | Low | Low | No | Possible | Possible | | | suggests that the new discharge into this waterbody will increase the |
| Reasons for Not Achieving Go (RNAG) | od | 529207 | Phosphate | No sector responsible | | | | | | | | | Further water quality modelling is required to determine the extent of changes in phosphate | | phosphate concentration, |
| | | | | | | Yes | 2 | Low | Low | No | Possible | | due to the transfer within this catchment | 2 | potentially leading to a reduction in the improvements that can be made |
| Reasons for Not Achieving Go (RNAG) | od | 517845 | Phosphate | Agriculture and rural land management | Pollution from rural areas | | | | | | | | | | to water quality. Further investigation into water quality |
| mercej | | 317043 | ritograte | Agriculture und Furur surru munugement | Total or Las | | | | | | | | | | needed |
| Reasons for Not Achieving Go | od | | | | | Yes | 2 | Low | Low | No | Possible | Possible | | 2 | |
| RNAG) | | 481844 | Phosphate | Water Industry | Pollution from waste water | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| Reasons for Not Achieving Go RNAG) | od | | | | | | | | | | | | | | |
| | | 530485 | Fish | No sector responsible | Non-native invasive species | No | | | | | | | | | |
| Reasons for Not Achieving Go RNAG) | od | | | | | | | | | | | | | | |
| | | 530486 | Fish | Other | Physical modifications | No | | | | | | | | | |
| Reasons for Not Achieving Go RNAG) | od | 520881 | Fish | Agriculture and rural land management | Physical modifications | No | | | | ĺ | | | | | |

Add the pipelines into this one

| | | | 7 | | | | | | | | | | Add the pipelines into this one | | | | | | | | | | | | | | | |
|-------------------------------------|---|--|--|---------------------|-------|--|--------------------------------------|--|--|--|--|--|--|--|---|---|--|---|--|---|---|--|---|--|--|--|--|---|
| Total Barby TD | GB205030062426 | Co. C. SEACOTTAN AND A CONTROL OF BA AND | 4 | | | | | Activity | | | New or increased ourflast water abstract | don | | | | | Non-tonder within the extrepance | | | | M | interance of pipe lines (including draining | platine | | ños : | ice lines involving watercourse crookings a | eth no in channel modifications | |
| Waterbody name | Lower Witham - conf Bain to Grand Sluic | | | | | | | Construction, Operation or Decommissioning activity | Constitut | Countries | Dometico | Counties | Country | Countries | Countries | Consticu | Operation | franties | Country | Operation | Epetition | Constion | Guestion | Question | Construction and coeration | Construction | Senitraction Construction | |
| Washofytops | Ew . | | 1 | | | | | Potential Impacts of exert (following consideration of embedd | ed | Common | COMMO! | Change to water body hydromophology leading to change, in niver processes and habitats upstream and | Change to water quality due to new or changes to existing discharge of curface water into ourface water body. | 194800 | Changes in flow selectly and volume (mosses): | 2,540.00 | Charge to ware body halforn ophicing hading to change in over process and habities. | Change in water quality-due to new orchanges to existing discharge of | CONTROL CONTRO | Changes in flow whostly and returns phonese or | | | Change in water quality due to new or change: to get strug discharge of surface water trits surface to | other Change in 1995 present in surface water - o | contraction and operation. Things to water body hydromochid ogyleating to thangs in over processes and habitats upstream and. | | | |
| Ndemorphological designation | Sends Mod Set | Action: Obtain HMNS measure information from the Environment Agenc | • | | | | | Related Plans | Change to channel footprint | Changes in flow wholity and retirent (Increase or decrease) | Charge in self-mentation deposition | downthean d | discharge of curtice water into our face water body | Changes to channel footprint | decision | Charge is self-nestation deposition | spottern and downstream | cortice water into curtain water body. | Change in IMME present in curtical vider body | decrees d | Change in self-rentation disposition | Moior and situation | lody | tody (| lountreet 4 | (increase or decrease) | Change in sedimentation deposition (6.00) and | ent stration |
| Comit status | Matrix | YO SIND TO THE FISHING POAR SELLS. | • | | | | | Mahamashahati sasarina denera. | , | , | , | - | , | - | , | , | | , | , | - | , | , | | | , | , | , | |
| Overall status objective | Maderia in 2015 | | + | | | | | Protection of Phys | , | x | , | , | , | , | , | , | , | , | × | | - | , | , | | * | × | x | * |
| | | | _ | | | Does the | te component comply with NFO objects | to bearing offers | , | × | × | × | , | × | * | × | x | , | × | , , , , , , , , , , , , , , , , , , , | × | * | | , , , | × | | × | × |
| | | | | | | | mitigation) | 1 | 1 | | | - | | - | - | | - | - | | | - | - | - | - | | - | | |
| WATE-UNION COMMONWELL | With quality element | MARRIAGE of charling compliance | | | M4555 | arabit arabit fansi | | 1 | E Comment of the impact of Changes to | Comment of the impact of 'Changes in New relocity and selume (increase or | Comment of the impact of 'Changes in self-mentation deposition' on each element | Comment of the Impact of 'Changes to water body | Comment of the impact of "Change in water quality due to new- change, to existing discharge of surface water into surface water | Comment of the Impact of Charges to | Comment of the Impact of 'Changes in Now | Comment of the impact of 'Orange in cell mentation deposition' on each element. | Comment of the Impact of Changes to water both bydromosphology leading to changes in viver | Comment of the impact of 'Change in water quality due to new or change to existing discharge of curtace water into ourface water tooky on each | Comment of the impact of Change in MMS present in surface waterbody on exhibitement | Comment of the impact of Changes in flow refor | Comment of the impact of 'Changes in self-mentation deposition' on each | Commercial the impact of Wolse and | Comment of the Impact of 'Change's water qual- due to new or changes to existing discharge of | Comment of the Impact of Change in | Comment of the Impact of Changes to water body | Comment of the Impact of Changes In C | Comment of the Impact of Change in Comment of the Impact of Change in Comment | ex of the impact of 'Hoise and |
| William Conjune | | and a county and and | O.A. F. A. F | Vigora: | No. | Property and prope | interest in the second | 1 | thered toopstot on each element | decision on each-deview | selimentation deposition' on each element | hadronophology leating to charge in over processes and habitate upchrain and downstream on each element | body on each element | channel footprint on each element | dener! | sellmentation deposition" on each element | processes and habitats upotream and downstream on each element | denot. | in surface water body on each element | and volume (Increase or decrease)" on each drame | element. | stretor on extr dement | surface water into surface water body' on each dement | each element | syltomorphology, reading to change, in ther processes and habitots opotesen and downstream' on each diemer | decease) on each element | president and a second a second and a second a second and | or on each element |
| | | | | | | - A | - i | 1 | 2 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | MMS teachment has been provided between the River Trent | No. of Carlos and Carlos and Carlos | Change in few and relocity caused by the new abstraction may have impact downstream. It should be noted that intelligible located downstream from new located (Asstrace con the few Millions and 1 to assure that I set I | Change in flow volume and whoch could change and report to a street to be a second to be a secon | Charges in Sow reliams and velocity could charge unknowness or pattern, between the discharge and the discharion and deserotrary of the discharion. This could | | | Changes in local whichly and flow between the | Charge in flow volume and velocity could be appropriately and the property of | Change in flow values and values and discould change hydromorphology, between the discharge of the advertises of deventions of the discould and the change of the devention. This could after biological quality demands, further investigation would be required. | | The public countried from the River Torol and self for | | Temporary infrequent localised changes | The same influence (to the street across | | Serporas infequent discharge from | to measurable effects articipated as a result of dranges. | Lacrost Course to Foundation | large in flow volume and velocity is a | |
| Biological quality elemen | Invendorates | Guidance-document avail libre | Good in 3015 | Good by 2015 | 2 60 | ne toe Positio | trie Possifière Po | MRS tractment has been provided between the River Treet administration and the transfer to the River Milham. Author highlands and water quality modelling is required to determine the extent of impacts within this calchiment. | 2 limited Scappins, minimal effection biological quality demants | dicital the same amount of with as is discharged upstream. Despite this supporting flow, change in local velocity and flow between the discharge. | discharge and abstraction and downsteam of a abstraction. This could affect biological quality | the distriction and downstream of the distriction. This could be affectioned as quality elements, further investigation and exount the required. | Change in water quality as a valual of the distraction, has the potential for minor localised impacts on investigate. | are articipated as a result of a channel in | discharge and distraction may still have an impact on biological quality demands, further investigation to provided to determine this | discharge and abstraction and downstream of abstraction. This could affect biological eleme | of the and abstraction and downsteam of the ment, abstraction. This could affect biological quality | Change 1s water quid by as a result of the abstraction, has the presented to either hackland impacts on investebrates. | traded for IRRE to ansure no IRRE transfer into the River Mitham. | Temporary Infrequent Local self changes to flow whochly equalled to have minimal effect on fich | to flow unlikely to effect set manufacture and especial to have minimal effect on the | unlikely to effect fish as they will move away from the source of the noise | Temporary infrequent local sed charges to water qualify unlikely to impact on Ech. | introduction of IMME as pipeline would contain the water from another waterbody. | to measurable effect anticipated as a result of change. In the hydromeurisations on the horizoptical quality terments. At this stigent is assumed construction methods with comprise of tenchicas activies. | around intake expected to have minimal effect on inventorates | control in the south and second as a feed of new inside could had be acid and change in self-med deposition which is entirpated to have minimal shirts in the toological demons. | ton, though inventorates to be sensitive to impact |
| | | | | | | | | | | and distriction may still have an impact on biology, but to an uncertain edent, further investigation is required. | elements, further transligation would be require | red. would be required. | | | | further investigation would be required. | deneric, futher investigation would be require | | | | | | | See Mitts assessment for more destrict | | | at on the triding car diseases. | |
| | | | | | | | | | | | | | | | Committee administration | | | | | | | | | | | | | |
| | Hydrological Regime | | Account should be William | Second dead to 2015 | | a la bora | | It is assumed best practice design will be implemented for | transcipated then will be minimal | Minor localised impacts are equated on the hydrological regime due to the | Potential increased sedimentation due to abstraction not espected to have significant effe on the hydrological regime. | Potential increased self-mentation due to abstraction not | | an automatic amount of a decoration | hybromoshology of the channel would be changed by additional flow in channel between the | Potential Increase in self-mentation is not expected to have a significant effection the hydrological regime. | Potential increase in sedimentation to not | | No effects are articipated on the hydrological | Temporary infrequent discharges are anticipated to have minimal effects on the hydrological regime. | | | | | to measurable effects anticipated as a result of changes. In hydromosphisiogy on the hydrological regime. At this | must of changes in flow whosty and solutes on the hydrological regime. At | and of charges in self-mentation on the | surdise impact anticipated on the |
| Netronophological Suppo Elements | | | | | | | | this assumed benyaction design will be implemented for the inside structure. Author/investigation is required to determine the extent of impacts. | effects on the hydrological regime. | (assumed to be assumed all and by the discharge in waterbody upcomen) | on the hydrological regime | rajne | | | upsteam reach and the distraction, disting channel processes and conditions such as water depth and from velocities | hydrological regime. | hydrological regime. | | ng/mr | have minimal effects on the hydrological regime. | | | | | tignitis accumed construction methods will comprise if treatment activities. | this stage in its assumed construction methods will comprise of transities: | urned construction methods will propriet of treathless attitudes. | ogical regime |
| Euranis | | | | | | | | | | | | | | | 104 00105 | | | | | | | | | | | | | |
| | Mitgelon Messure Assessment | | Moderate or less in 2015 | Good by 2027 | | ow ton No | 160 | this assumed ben practice design will be implemented for the inside structure. At the sectings, the militarion resource assessment wit need to be requested. | Minor local self impacts are antiquated, shar to the inches increasing the physical modification are series. | Changes in flow and selectly unlikely to significantly affect physical endifications pressure | Fotential increased sedimentation due to abstraction not expected to have significant effe on mitigation measures. | Patential increased self-mentation due to abstraction not | No measurable impact anticipated on the mitigation measures | are articipated as a result of a charved in | Changes in flow selectly and volume will unlikely significantly affect the mitigation measures assessment | Potential increase in sedimentation is not expected to have a significant effect on the | fraterial increase in sell-martelion is not equated to have a significant effect on the eritgation resource assessment. | No effects are anticipated on the militation measure assessment | No effects are anticipated on the mitigation measure | | | | | | to measurable effects anticipated as a result of changes in hydromorphology on the mitigation measures assument. At this stage it is assumed construction methods will comprise of tenchinos actitates. | Charge in flow and wholly unlikely to significantly affect physical | sentid increased setimentation due to the major struction not expected to have | writte impail artispated on the |
| | | | | | | | | masures assumed will need to be requested. | present. | | an miligation maximum | - Josephanes - Apartesse | | | auconed | miligation measurer assessment. | eritgation measures assessment | | | | | | | | methods will comprise of tenchios activies. | ared Scatters pressure | e hard effect on mitigation measures. The light co- | |
| | | | | | | | | | | | | | | | | | | A high lead water quality assessment of the procosed weeks from the fit | | | | | | | | | | |
| | Ammonia (sota ec N) | | Scot in 2015 | Scot by 2015 | | ne los Pours | tia Positia Po | | | | | | | | | | | for to the five Witten suggests that there will be an increase in armount 1% due to the discharge from the five free limit the supplemental than | ** | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | GBC05230056-360; Kurther investigation is required to determine the impact. On agreear/femay halfs an artise adverse impact is expected. | | | | | | | | | | |
| | | | | | | | | _ | | | | | | | | | | Things have were quarty assessment of the proposed transfer than the fit | 4 | | | | | | | | | |
| | Biochemical oxygen demand | Mumerical limits for classes | Hgs in 2015 | No data analisti e | | ow ton No | Ho Ho | No. | • | | | | | | | | | Tend to the filer Without suggests that there will be a decrease in Disselve decreased. All the Astronomy Sections from Section 2015 for any Section 2015. | 4 | | | | | | | | $\overline{}$ | |
| | | | | | | | . 160 | | | | | | | | | | | A high level water quality assessment of the proposed transfer from the fit front to the filter Witham suggests that there will be a decrease in BCO of I'll due to the discharge from the filter front into the workeam Witham | | | | | | | | | | |
| | Dissolved coages. | Numerical times for classes | 9000 in 3013 | 00000 trs 2015 | | no ten No | " " | * | | | | | | | | | | (SECOS 338056760). Within this cachiment, BOB leads are expected to be lower, however further investigation in required to determine the predicted | | | | | | | | | | |
| | | | | | | | | - | | | | | | | | | | to the present only said a register in part is expected. | | | No resourcitie effects anticipated as a | | | | | | | |
| Physics-chemical quality der | · [_ | | MAIN 2013 | And in 1975 | | | , No | Purfee water quality modelling is required to determine the extent of impacts within this cathinest | effects on the physics-chemical elements | | No resource effect antiquited as a reset of changes in the self-mentation deposition on the physics chemicals. | the hydromophology on the physico-chemicals | Minor effects anticipated as a result of assistation on the physic chamicals | the effects are articipated on the physical chemicals as a result of a channel in flooguists | | chemicals as a result of a changes to the settimentation | the effects are and or putted on the physicis- chemicals as a result of a changes to the frafformosphalogy. | her to the flow Without suggests that there will be an inconcer pitrof due to the discharge from the flow fraction the upstraws Without | • | No measurable effects anticipated as a result of changes in flow and whochy on the physico- chemical elements | result of charges in self-mentation deposition on the physics-chemical | result of charges in noise and vibration on the physics chemical densers. | changes in water quality on the physico-chemi- dements. | cal result of changes in water quality on the physics chemical elements. | | | | |
| | | | | | | | | | | | | | | | | | | (SLC09330003-76C) White the calciument, pill leads an expendit to be taken, however further investigation in regulard to determine the predicted to the presculpturary facility aminor localised impacting execute. | · · | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | her to the five Wither suggest that thes will be an increasin phosphate of ATN due to the discharge from the Kine Test I visite. | | | | | | | | | | |
| | Phosphate | Calculator assitable | Moderno in 1815 | Modeste by 2015 | | ow tow Ye | - 1 | • | | | | | | | | | | opches. Where (SECOLDOSE PRO) Minis his cocharest, thoughor tests are equated to be lower, however further investigation is required to | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | Copered. | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | A high land water quality assessment of the proposed transfer from the fit from to the filter Withorn suggests that there will be an incosperin. | ~ | | | | | | | | | |
| | Serpesture | Humarical Elevis for classes | High in 2015 | Good by 2015 | 1 6 | ow ton No | . 100 | ** | 1 | | | | | | | | | temporates of 1% due to the discharge from the fine frechisto the system. When 158:05510055 (705), Within this cacher est, temporat, is another to be lower forward for the contraction in securing to. | <mark>-</mark> | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | determine the predicted %. On a precadionary basic a minor localised impact is expected. | | | | | | | | | | |
| | Acid Meutralising Capacity | Numerical limits for classes | High in 2015 | Good by 2015 | | ow Low No | Ho Ho | No | • | | | | | | | | | | | | | | | | | | | |
| | Records and 80 horanthese | 8Q5-directive | dood in 2015 | Scot | | ow ton No | 180 | No. | • | | | | | | | | | | | | | | | | | | | |
| | Berzo (ghi) perijene and Indexo (123 od) pyrene | 6Q5 directive | Good in 2015 | Good | | ow tow No | No. | No. | • | | | | | | | | | | | | | | | | | | | |
| Bringly harvador Access | Besolijayene | 8Q5-direction | Good in 3015 | Good | 0 6 | ow Los No | Ho Ho | No. | • | | | | | | | | | | | | | | | | | | | |
| | Caterium and its Compounds | RQS-direction | Sood in 2015 | 0008 | | ne ton No | 160 | No. | | | | | | | | | | | | | | | | | | | | |
| | lindosuitan | 925 directive | Good in 2015 | Good | 0 1 | Der Los No | No. | No. | | | | | | | | | | | | | | | | | | | | |
| | Heachiorocyclehoune | 0QS-direction | Good in 2015 | Good | | ow ton No | Ho Ho | No. | • | | | | | | | | | | | | | | | | | | | |
| | Mesory and its Compounds | RQS-directive | 500d in 2015 | Scot | | re ton No | 160 | No. | • | | | | | | | | | | | | | | | | | | | |
| | 1,3-dichiocethane | 925 directive | Good in 2015 | Good | | ow tow No | | No. | • | | | | | | | | | | | | | | | | | | | |
| | Atracine | 8Q5-directive | Good in 2015 | Good | | ne ton No | No. | No. | • | | | | | | | | | | | | | | | | | | | |
| | Russitiene | 8Q5-directive | Good in 2015 | Seed | | ow ton No | No. | | • | | | | | | | | | | | | | | | | | | | |
| Priority substances | boot and its Compounds | 6Q5-directive | Good in 3015 | Good | 0 1 | Der Los No | No. | No. | • | | | | No meaurable effects anticipated as a rough of abstraction on | | | | | No measurable effects anticipated as a result of abstraction on chemical | | | | | No measurable effects anticipated as a result of changes from temporary infrequent local and | | | | | |
| | Wichel and Its Compounds | 8Q5-directive | Scod in 2015 | Steed | | ow ton No | 160 | No. | • | | | | | | | | | | | | | | poet ne discharge. | | | | | |
| | Persolitorighend | 8Q5-directive | 9cod in 2015 | Seed | | ton No | 765 | No. | • | | | | | | | | | | | | | | | | | | | |
| | States | 8Q5-directive | Scod in 3015 | Seed | | Der Line No | No. | No. | • | | | | | | | | | | | | | | | | | | | |
| | Vickion+ehave | 805-direction | Scod in 2015 | Steel | | ow ton No | 165 | No. | • | | | | | | | | | | | | | | - | | | | | |
| | Asseic | | Hgcis 2005 | Hyb | | ton No | 160 | No. | • | | | | | | | | | | | | | | | | | | | |
| Specific pollutares | Copper | | High th 2005 | нд | | ow ton No | 160 | No. | • | | | | | | | | | | | | | | | | | | | |
| | 101 | | HgA19 2005 | ну | | ow ton No | 165 | No. | • | | | | | | | | | | | | | | | | | | | |
| | Marganese | | Hgcis 2005 | High | 0 1 | ton No | 160 | No. | • | | | | | | | | | | | | | | | | | | | |
| | åк | | High to 2005 | нд | | ow ton No | 160 | No. | • | | | | | | | | | | | | | | | | | | | |
| Otherchemicals | Aldris, Oxfors, Endris & toodris | 8Q5-directive | Good := 3013 | Good | | ow ton No | 165 | No. | • | | | | | | | | | | | | | | | | | | | |
| | Caltion Titrachionide | 8Q5 directive | Scod in 2015 | Seed | | ton No | 160 | No. | • | | | | | | | | | | | | | | | | | | | |
| | Victionallyless | BQS-direction | Scot in 2015 | Seed | | ow Los No | Ho. | No. | 1 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | 1 | | |
|--|---------|---|--|---|--|----------------------------|-----------------|-----|---|-----------------------------|---|--|--|---|
| Return to top of the page | | | | | | | | | Does to | e component comply with MFS | abjectives | | | |
| EXAL(FUM/440AB) | | Release 1990 Quality Someon (RNIQ) / Measure category 1 (PnM) | Category (RNAS)/Lead organization (PoNA) | National Sumi Header (RNAS) / Title (PuM) | Is this measure potential impacted by the observe? (No./No.) | Ingest serve gravatered | Date confidence | 8 | Assists attainment of water body objectives | Impediment to GEVIEF | Compramis co water bedy objectives | Mitigation applied | Post miligation impact some (d to 3) | New tanche within the watering |
| Resons for Not Achieving Good (KNAZ) | 11.7914 | Phosphate | Agriculture and rusk land management | Pohation from runit areas | ~ | 2 | tev | tem | ** | Possible | Possible | | 2 | A highland water and hyracine suggests that the new discharge int |
| Ressons for Not Achieving Good (RNRG) | 51.7966 | Phophe | Water Industry | Polution from water water | - | 2 | lev | tow | ж. | Possible | Possible | Earther water quality modelling is required to determine the extent of impacts within this cathrinest | 2 | this waterbody will increase the phosphate concentration, potential reading to a reduction in the improvements that can be made to |
| Massons for Not Activetry Good | | | | | - | 2 | low | tow | | Possible | Possible | | 2 | water quality. Further investigation water quality medical |

WFD standards for Phosphorous

standard in rivers:

Table 5

| Phosphorus S | Standards in Rivers ⁽ⁱ⁾ |
|--------------|--|
| Annual mean | reactive phosphorus concentration (in µg per litre) is calculated as follows: |
| High | 10 to the power of ((1.0497 x $log_{10}(0.702)+1.066$) x ($log_{10}(RP_{ref}) - log_{10}(3,500)$) + $log_{10}(3,500)$ |
| Good | 10 to the power of ((1.0497 x $\log_{10}(0.532)+1.066$) x ($\log_{10}(RP_{ref}) - \log_{10}(3,500)$) + $\log_{10}(3,500)$) |
| Moderate | 10 to the power of $((1.0497 \times log_{10}(0.356)+1.066) \times (log_{10}(RP_{ref}) - log_{10}(3,500)) + log_{10}(3,500))$ |
| Poor | 10 to the power of $((1.0497 \times log_{10}(0.166)+1.066) \times (log_{10}(RP_{ref}) - log_{10}(3,500)) + log_{10}(3,500))$ |

 $^{(i)}$ In this table, "Reactive phosphorus concentration" means the concentration of phosphorus as determined using the phosphomolybdenum blue colorimetric method. Where necessary to ensure the accuracy of the method, samples are recommended to be filtered using a filter not smaller than 0.45 μ m pore size to remove gross particulate matter.

"RPref" represents the annual mean concentration of reactive phosphorus in $\mu g/l$ estimated for the site under reference conditions using the equation: 10 to the power of (0.454 (log₁₀Alkalinity) – 0.0018 (Altitude) + 0.476). If the value calculated for RPref using the equation above is less than 7 $\mu g/l$, it must be substituted for the purposes of calculating the standards for phosphorus by a value of 7 $\mu g/l$. For the purposes of calculating RPref:

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- (i) "Alkalinity" is the concentration of CaCO3 in mg/l. If a site has an alkalinity greater than 250 mg/l CaCO3, a value for alkalinity of 250 must be used for the purposes of calculating RPref. If a site has an alkalinity of less than 2, a value for alkalinity of 2 must be used for the purposes of calculating RPref.
- (ii) "Altitude" means the site's altitude above mean sea level in metres. If a site has an altitude of greater than 355 metres, a value for altitude of 355 metres must be used for the purposes of calculating RPref.

WFD phosphorous standards for the River Witham (based on table 5):

Calculations:

| Atomic weight | |
|----------------|----|
| Phosphorus | 31 |
| Atomic weight | |
| orthophosphate | 95 |

| Alkalinity @ Claypole | | |
|--------------------------|----------|------------|
| (average) | 208 | mg/I CaCO3 |
| | | |
| Altitude | 15 | mAOD |
| Rpref | 31.72494 | ug/l |

| High | 50 | ug/l |
|----------|------|------|
| | | |
| Good | 90 | ug/l |
| Moderate | 213 | ug/l |
| | | |
| Poor | 1094 | ug/l |

| Current status on catchment data exp | plorer for River Witham is Modera | ite |
|--------------------------------------|-----------------------------------|-----|
|--------------------------------------|-----------------------------------|-----|

Estimated changes in phosphate / phosphorus concentration due to proposed transfer:

| Orthophosphate c | concentrati | on | Phosphorus concentration | | Standards as po- calculations fro table 5 | | % of Sour | ce Water | |
|--|-------------|------|---|------------------|---|---|-----------|------------|--------------------|
| baseline R Witham (average) | 256 | ug/l | | 33.5 | Good/Moderate | e | Witham | 8% | |
| baseline R Witham (max) | 521 | | 1 | 70.0 | Moderate | | Trent | 92% | |
| Baseline R Trent (average) | 389 | ug/l | 1 | 26.9 | Moderate | | | | |
| Baseline R Trent (max) | 1020 | | 3 | 32.8 | Poor | | | | |
| | | - | Potential phosphorus | T | | _ | | | |
| Potential orthoph at River Witham with | · | F | concentration at River Witham with discharge from Trent | ca | andards as per llculations from ble 5 | | | | |
| average conc | 378.36 | ug/l | 123./ | 5 <mark>M</mark> | oderate | | | | |
| max conc | 980.08 | ug/l | 319.8 | 3 Po | or | | | | |
| | | | , | | | | | Therefore, | , potential for de |

WFD standard for Ammonia:

Table 7

| Ammonia standof Schedule 2) | dards for rivers | (rivers categorised | by type in accordanc | e with paragraph 1(1 |
|-----------------------------|------------------|---------------------|----------------------|----------------------|
| Total Ammonia | as nitrogen (mg/ | 1) | | |
| (90 percentile) | No. | 20 | 360 | 17 |
| Туре | High | Good | Moderate | Poor |
| 1, 2, 4 and 6 | 0.2 | 0.3 | 0.75 | 1.1 |
| 3, 5 and 7 | 0.3 | 0.6 | 1.1 | 2.5 |

Table 1

| Criteria for ident demand and amr | | | | d oxygen, bioche | mical oxygen | | | | | | |
|--------------------------------------|---|---------------|-------------|------------------|--------------|--|--|--|--|--|--|
| Site Altitude | Alkalinity (as mg/1 CaCO ₃) | | | | | | | | | | |
| | Less than 10 | ≥10 to <50 | ≥50 to <100 | ≥100 to <200 | Over 200 | | | | | | |
| Under 80 metres | Type 1 | Type 2 | Type 3 | Type 5 | Type 7 | | | | | | |
| Over 80 metres | om sitesocia | September 200 | Type 4 | Type 6 | | | | | | | |

River Witham is at 17mAOD with an average alkalinity of 208mg/l therefore would be a type 7 river WFD ammonia standards for the River Witham (based on table 7):

| High | 0.3 | mg/l as N |
|----------|-----|-----------|
| Good | 0.6 | mg/l as N |
| Moderate | 1.1 | mg/l as N |
| Poor | 2.5 | mg/l as N |

Estimated changes in ammonia concentration due to proposed transfer:

| Estimated changes in animoma concentration due to proposed transier. | | | | |
|--|-------|---------------------------|------------------|--|
| | | | Standards as per | |
| 90%ile | | calculations from table 7 | | |
| baseline R Witham (average) | 0.06 | mg/l as N | High | |
| baseline R Witham (90%ile) | 0.09 | mg/l as N | High | |
| Baseline R Trent (average) | 0.184 | mg/l as N | High | |
| Baseline R Trent (90%ile) | 0.32 | mg/l as N | Good | |

Potential ammonia concentration at Witham v discharge from Trent

90%ile conc 0.3016 ug/l

Therefore, potential for deterioration in River Witham from high to good



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