



30/03/26

IWA Response to Grand Union Canal Transfer Phase Two Public Consultation

The Inland Waterways Association (IWA) is the membership charity that works to protect and restore the country's 7000 miles of canals and navigable rivers. IWA is a national organisation with a network of volunteers and branches who deploy their expertise and knowledge to work constructively with navigation authorities, local and national government and other organisations. The Association also provides practical and technical support to restoration projects through its Restoration Hub.

IWA thanks Severn Trent, Affinity Water and Canal & River Trust (CRT) for the opportunity to respond to the Phase Two Public Consultation, provided on the following pages. IWA also thanks Canal & River Trust and Affinity Water for arranging the meeting with them and their consultants on 20 March.

Submitted by Amy Tillson, IWA Senior Campaigns Officer

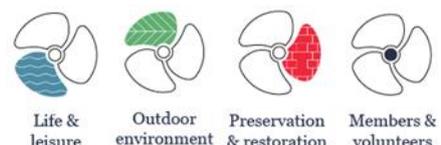
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PREAMBLE

The interests of IWA, seeking to enhance navigation on the UK waterways network, should be generally aligned with those of CRT. However, the GUCT Phase 2 consultation documentation fails to demonstrate that navigation will be enhanced and gives rise to concerns that, overall, navigation may deteriorate.

IWA provided three responses to the Phase 1 Public Consultation in 2024 and subsequently raised its key engineering concerns in emails to CRT's project manager dated 26 September 2025 and 28 November 2025, the latter also copied to Affinity. It is not apparent to IWA that these concerns have been addressed.

On 20 March 2026, IWA met CRT, Affinity Water and their consultants (AECOM and JBA) in the CRT Milton Keynes Office and online. The agenda for the meeting was based on a draft version of this consultation response.

CRT and Affinity confirmed that they had addressed, or were currently addressing, the issues raised in IWA's Water Transfer Guidelines but acknowledged that very few of their studies and conclusions were documented in the consultation documents. They have also addressed many of the issues raised in the draft IWA consultation response, but again these are not documented in the consultation documents. CRT and Affinity concluded that they need to find a way to summarise the numerous technical studies and place them in the public domain, potentially in late summer 2026 so that there is an opportunity for further discussion and feedback before formal commencement of the DCO process.

As the solutions proposed by CRT and Affinity are not presented in the consultation documents, this response continues to record such matters to ensure that IWA's concerns and uncertainties are placed in the public domain. IWA considers it essential that the DCO documentation, and preferably an earlier documentation issue, should present a comprehensive suite of engineering solutions proposed for the scheme.

In this response IWA identifies Key Concerns and Matters of Detail:

- Key Concerns are primarily engineering matters, about 100 individual topics, which are not mentioned in the present consultation documents. While CRT and Affinity stated in the meeting that they have studied these topics, IWA doubts remain in the absence of any presentation of such studies and conclusions in the consultation documents. IWA considers that these matters need to be documented, with the present environmental and heritage documentation updated accordingly, and then discussed in a further round of consultation before the DCO process commences. During the meeting, CRT and Affinity

aspired to issue such technical documentation in late summer 2026, with a follow up meeting with IWA in September or October 2026 to discuss the findings.

- Matters of Detail are comments on matters which are mentioned, or in some cases are not mentioned, in the consultation documents, and are often, but not always, related to the Key Concerns.

In addition there are two Appendices:

- Appendix A discusses various water management issues which recur multiple times in the consultation document and response.
- Appendix B presents some notes on hydraulic gradient, freeboard and dredging.

KEY CONCERNS

1 IWA's key concerns in the present round of consultations may be summarised as follows:

1.1 Engineering Feasibility Study

- 1.1.1 On 6 February 2026, IWA published a set of guidelines for water transfer via navigable waterways (available at [Water-Transfer-Guidelines-V1-26-02.pdf](#)), though a preliminary copy was provided to CRT and Affinity on 28 November 2025.
- 1.1.2 The guidelines identify and describe over 100 technical topics which should be addressed during the planning and design stage of any water transfer scheme. It appears that about 80-90% of these topics are not mentioned in the Phase 2 consultation documents. In contrast, IWA notes that the consultation documents include nearly 250 files of environmental reports and data.
- 1.1.3 Discussion with CRT and Affinity has indicated that most of these topics have been addressed, even though the results are not reported in the consultation documents.
- 1.1.4 IWA is of the opinion that a comprehensive engineering feasibility study, with appropriate supporting appendices, addressing all topics in the guidelines, should be prepared, published and subjected to a round of consultation before commencing the DCO process. The study should specifically address the four key concerns discussed below:
- Water Management
 - Design principles and design criteria
 - Bypasses (pumped and gravity) and weir levels
 - Reduced Minimum Operating Level (to reduce required bank raising)
- 1.1.5 IWA considers it essential that Affinity and CRT place into the public domain a set of longitudinal sections (hydraulic grade line drawings) along the entire transfer length showing, at about 100m intervals and for both the existing situation and the planned future situation, bed level, silt level, minimum operating level, water levels at zero, 25, 40, 80 and 115 Ml/day flows, normal top water level and bank level; also all weir crest levels, any sill levels, bridge soffit levels, new bypass inlet and outlet levels and similar. IWA finds it difficult to understand how CRT and Affinity have identified the required works and environmental impacts if this information is not available. (CRT/Affinity explained that this information is available within their GIS, so it should be simple enough to create a relevant set of drawings for public information.)

1.2 Water management

- 1.2.1 IWA previously estimated that, due to raised water levels throughout the canal length, about 4% of transferred water may be lost due to increased

lockage, leakage, evaporation and seepage. The present consultation sets out that Daventry and Drayton reservoirs are to be maintained full under most circumstances, so there will be increased seepage and evaporation losses there, and the new storage reservoir at Galley WTW will also suffer from losses due to seepage and evaporation. It appears that about 4-5% of the water supplied into the canal at Atherstone may be lost before it reaches the water treatment works at Great Brickhill, but no discussion of this has been found in the consultation documents.

- 1.2.2 CRT has advised, in discussion, that the nominal maximum capacity of 115ML/day represents the input to the canal at Atherstone. It recognises that there will be losses from the canal and reservoirs, the magnitude of such losses varying with flow rates and water levels.
- 1.2.3 The Phase 2 consultation document (at page 72) proposes that Daventry and Drayton reservoirs should be maintained full at most times. These two reservoirs receive water from their catchments for much of the year, which is then supplied to the Grand Union Canal with the potential to distribute that water, by pumping or gravity, to other canals and arms. If the reservoirs are kept permanently full then there will be no available storage to take in water from rainfall events and normal stream flow, and much of that supply will need to be discharged to waste. This loss of gravity fed water supply to reservoirs and thence the canal for normal operational consumption would need to be made up by pumping from Minworth. During the meeting on 20 March, CRT and Affinity stated that the drafting was misleading – they were seeking to develop an optimised operating rule which would maintain the reservoirs fuller, but not full.
- 1.2.4 CRT has the capability to transfer water from the GUCT to the wider canal network by both gravity and pumping:
- By gravity at Atherstone to the northern Coventry Canal and thence to Shardlow (near Trent Junction between Derby and Nottingham) via the Birmingham & Fazeley Canal and the Trent & Mersey Canal; at Calcutt to the northwestern Grand Union Canal to Warwick; and at Gayton Junction to the Northampton Arm.
 - By pumping at Stoke Hammond to the southern Grand Union Canal and thence to London; at Napton to the southern Oxford Canal and thence to Oxford; and at Norton Junction to the Leicester Arm to Leicester.
- 1.2.5 Under existing arrangements this provides CRT with the opportunity, under its sole management control, to keep these sections of canal in water, subject to water availability in the reservoirs. While the technical capability to transfer water will remain under the new arrangements, management will no longer be under sole CRT control. It needs to be demonstrated that supplies to these canals will be no less than the supplies historically provided, and ideally increased.
- 1.2.6 During the consultation period CRT advised that this is its intent and that it expects supplies to the wider canal network to increase. However, it has

not yet demonstrated a robust method to assess historic transfers which would need to be documented and appropriately protected in commercial agreements. IWA sets out an alternative concept to address this issue in Section 10 in Appendix A of this response.

- 1.2.7 Within the consultation there are numerous mentions of control buildings, though with no indication of what is being controlled or of the management principles underlying that control.
- 1.2.8 Within the consultation brochure, the only mention of the Ashby Canal, which is hydraulically connected to and forms part of GUCT, appears to be in the caption of one photograph; there is mention of a culvert at paragraph 3.7.67 but no other reference has been found by IWA. Prior to the DCO process, it needs to be demonstrated that there are no adverse effects and no works required along this 22-mile length of the Ashby Canal, and that seepage and evaporation losses have been taken into account.
- 1.2.9 Capacity figures presented on page 12 of the consultation brochure indicate a maximum transfer capacity of 115 ML/day, typical transfers of 50-80 ML/day and minimum transfers of 23 ML/day; there is also mention of potential to supply storage reservoirs along the route. There appears to be significant spare capacity from within the transfer (or from hydraulically connected canals) whenever Affinity does not require the full amount of water. The next consultation document or DCO submission should include discussion of what options have been identified to supply water to third parties in future (such as via the regional Strategic Pipeline Alliance water grid) with an indication of the timescale over which these might be developed so that readers have a better understanding of the extent to which transfers may increase over the next few decades, and what the impact may be for canal users.

1.3 Design principles and design criteria

- 1.3.1 The purpose of the draft Design Principles document (as stated at page 9) is to *“help ensure we blend any new buildings and infrastructure, such as the new water treatment works, into the local environment.”*
- 1.3.2 IWA has not found any mention of engineering design principles or design criteria in the Design Principles document or in any other consultation document. The document describes overarching design principles related to Safe and Well, Climate, People, Place, and Value (p. 6). While it discusses the use of engineering in historic contexts and new infrastructure, it does not explicitly detail specific engineering design principles for the new works.
- 1.3.3 As noted above, IWA’s Water Transfer Guidelines identify over 100 topics which will need to have appropriate engineering design principles and design criteria developed. From discussion with CRT, it is apparent that these studies have been undertaken but not reported in the consultation documents.

1.4 Bypasses (pumped and gravity) and weir levels

- 1.4.1 Good practice dictates the following design criteria for bypasses:
- No inlet or outlet within 1.5 boat lengths of a restriction (to avoid transverse flows when manoeuvring a boat to navigate through the restriction).
 - Mooring for at least two boats is required upstream and downstream of any lock, and boats in such moorings should not adversely affect navigation into and out of the lock.
 - It is unacceptable to moor a craft across an inlet or outlet, and this may need to be physically prevented.
 - Ideally any inlet and outlets should be on the off-side of the canal. If this is not possible then mooring and pedestrian access should be provided on the off-side of the canal.
- 1.4.2 The consultation document does not provide sufficient detail to assess the realism of the bypass proposals and whether or not they may adversely affect navigation.
- 1.4.3 It is not clear why the gravity bypasses require a control building, or what is to be controlled. A conventional gravity bypass has a fixed weir with crest length chosen to suit flow and water levels. In discussion CRT has clarified that it intends that bypasses should have moveable weir crests, with the fixed crest at or about the lower limit of the Normal Operating Zone. This is not described in the consultation document. Within the consultation documents, the numerous discussions of water level address the increase in water levels, need for bank raising and risk of flooding, the only mention of lower water levels being in the context of the new transfer locks (where the accompanying illustration does not show any reduction in water level).
- 1.4.4 There are various mentions in the consultation documents about the need to vary weir levels and weir capacities, but no information to allow interested parties to understand what is proposed or how such changes might affect water levels, navigation and drainage.

1.5 Reduced Minimum Operating Level (to reduce required bank raising)

- 1.5.1 This section should be read in conjunction with Appendix B which presents some notes on hydraulic gradient, freeboard and dredging.
- 1.5.2 IWA understands that CRT manages canal water levels using the concept of a Normal Operating Zone (NOZ) within each pound.
- 1.5.3 Although terminology varies between CRT documents, the upper bound of the NOZ is generally referred to as the Normal Top Water Level (NTWL), and the lower bound as the Minimum Operating Level (MOL).
- 1.5.4 The consultation documents indicate that the extent of proposed bank raising and the design of the transfer locks are constrained primarily by the assumed MOL in each pound. IWA considers that, in some locations, it may be technically feasible to reduce the MOL from current assumptions, thereby reducing or avoiding the need for bank raising.

- 1.5.5 MOL is not a fixed policy value but a derived level based on physical constraints. In principle, MOL is governed by the higher of the following:
- Within a pound: $MOL = \text{bed level} + \text{silt allowance} + \text{design draft} + \text{under-keel clearance}$
 - At lock sills or other hard underwater structures: $MOL = \text{structure level} + \text{design draft} + \text{under-keel clearance}$
- 1.5.6 IWA has not found firm values for these variables in the consultation material:
- Bed levels and structure levels should be known to CRT.
 - Silt allowance: CRT typically assumes 150–300 mm depending on canal class and dredging regime.
 - Design draft: CRT’s published “rough guide” suggests:
 - Coventry Canal: 1.07 m
 - Oxford Canal :1.10 m
 - Grand Union Canal: 1.17 m
 - Ashby Canal and connected arms: 1.00–1.10 m
 - Under-keel clearance: CRT typically uses 150–250 mm for narrow canals and 200–300 mm for broad canals.
- 1.5.7 IWA considers that the assumed silt allowance could be reduced if an enhanced dredging regime were adopted during construction and operation. A cost–benefit comparison between dredging and bank raising should be presented.
- 1.5.8 If CRT is able to define a consistent “design draft” for the purposes of the GUCT scheme, there may be pounds where applying this value would permit a reduction in MOL and therefore reduce the need for bank raising.
- 1.5.9 IWA also notes that the consultation suggests that flows above 80 MI/day may occur only once every 10–20 years. It may therefore be reasonable to apply temporary navigation restrictions (i.e., a reduced design draft) during such rare high-flow events, thereby avoiding permanent bank raising.
- 1.5.10 The appropriate allowance for under-keel clearance should be re-examined, particularly at lock sills where vessel speeds are low and at locations where enhanced dredging could reduce uncertainty.
- 1.5.11 Bank raising is driven by design high water levels, not MOL alone. However, if MOL is lowered, NTWL might also be lowered in some locations, and this might permit reduction in design flood level and the required bank crest level.
- 1.5.12 The consultation does not present the vertical level budget (bed level, silt allowance, design draft, clearance, MOL, NTWL, design high water level, bank crest) for each pound at zero transfer flow, 80 MI/day and 115 MI/day. Without this information, stakeholders cannot assess whether bank raising is genuinely necessary.

1.5.13

IWA therefore considers that the option of reducing MOL has not been adequately explored by CRT and Affinity Water and should be examined before bank raising is adopted as the preferred solution.

MATTERS OF DETAIL

2 Phase 2 Public Consultation Brochure

2.1 P5 – benefits for canal customers and users.

2.1.1 The document states, as a benefit for canal customers and users:

“The scheme will increase the resilience of the canal network during times of drought, by delivering a year-round supply of water from the Midlands to the Southeast, when the usual feed of water for navigation could run low.”

The present CRT network has the capability to deliver water from the reservoirs and canal lengths forming the future GUCT to the Southeast (and in other directions), specifically

- By pumping to Tring Summit and thence by gravity to London
- By gravity down the Northampton Arm and the River Nene
- By pumping from Napton Junction to the summit of the Oxford Canal and thence by gravity to Oxford and the River Thames

The consultation documents do not indicate what volumes of water have been transferred down these routes historically, nor do they state what increased volumes may be transferred in future (or on what commercial basis).

2.1.2 The document also states:

“It will also provide a revenue stream for the Trust through a new commercial arrangement with the water companies, to enable improvements to the existing canal network and secure its benefits, now and in the future.”

While IWA recognises that such benefits are currently uncertain and subject to change, some preliminary information about revenue, cost and risk to CRT should be provided to demonstrate to canal users that the net benefits are positive.

2.1.3 IWA notes that, elsewhere in the document, the transfer of water to the Southeast is stated to be for the benefit of Affinity’s customers, not for the benefit of canal customers and users. If this is the case then there appear to be minimal benefits for canal customers and users other than the revenue stream to CRT – in which case it becomes more important that IWA and the public understand the magnitude of this potential benefit.

2.2 P12 – how much water will be transferred?

2.2.1 As noted previously, and elsewhere in this response, IWA assess that approximately 4-5% of the water supplied into the canal at Atherstone will be lost to evaporation, seepage, leakage and lockage.

2.2.2 IWA considers that future consultation documents should address this issue so that in any discussion of transfer volumes it is apparent that the

nominal transfer amount is measured at Atherstone and that deliveries at Great Brickhill are likely to be somewhat lower.

- 2.2.3 The transfer velocity is to be limited to 0.3 m/s, though it is not clear whether this is an average velocity across the width of the canal or local maximum velocity (such as at bridge abutment foundations or other restrictions).
- 2.2.4 It appears that the average velocity in the narrow Coventry and Oxford Canals may often be sufficient to scour soft uncompacted silt from the bed of the canal, and that the same scour issues may occur at bridges and other restrictions throughout the length of GUCT. 0.3 m/s may even scour sand under some conditions, and possibly clay loosened during construction. PEIR Volume 2, Chapter 22, Reference 110 “AECOM (2024) Grand Union Canal SRO Environmental Assessment (Gate 3) GUC Flow Impacts on Sediment” is relevant to this topic, but it does not appear to be available online and has not been examined by IWA. Paragraph 22.9.317 observes that “*localised effects on sediment mobilisation may occur*”.
- 2.2.5 Studies are required to understand the extent of such scour and where any scour materials may subsequently be re-deposited. P96 states : “*It’s not anticipated that the scheme will result in more dredging requirements than what’s currently carried out as part of the general canal maintenance operations. However, this will be further considered as we continue to develop our proposals.*” Overall this may be correct as the transfer scheme should not introduce more silt and other materials (except during construction). However, it is clear that dredging is likely to be required at different locations and times compared to present arrangements.

2.3 P24 – draft Design Principles

- 2.3.1 The design principles address five themes: Safe and Well, Climate, People, Place and Value. The design principles, and the consultation in general, do not address engineering of the scheme.
- 2.3.2 As discussed in more detail elsewhere in this response, the IWA guidelines on water transfer via navigable waterways identify over 100 engineering topics which should be addressed in a future consultation before the DCO process commences. Such consultation is not currently included in the project time schedule.

2.4 P43 – transferring water

- 2.4.1 “*Over several years, we’ve carried out extensive technical studies to understand where new infrastructure will be needed to support the scheme.*”
- 2.4.2 Although nearly 250 environmental studies and documents have been published as part of the consultation, these “extensive technical studies” have not been published. In the absence of such published studies, nor even the titles of such studies, IWA cannot be confident that adequate engineering studies of the canal section of the scheme have been undertaken. As noted elsewhere, IWA’s guidelines on water transfer via

navigable waterways identify over 100 engineering topics that should be addressed, with 80-90% of those topics never mentioned in the consultation documents.

2.5 P45 – water flow

2.5.1 *“Although we’ll be transferring additional water in the canal, we don’t expect the flow of water running through it to increase substantially.”*

2.5.2 Historically, UK canals typically had a capability to transfer up to about 20 Ml/day for operational purposes. IWA considers an increase by a factor of 4 or 5 to be a substantial increase. In addition, in several locations on GUCT, water is to be transferred in the opposite direction to the normal flow direction.

2.5.3 The text in the consultation document seems to assume that velocity of flow is the only factor requiring consideration, which is not the case.

2.6 P46 – water levels

2.6.1 *“We’ve carried out modelling along the canal to understand where the additional water we’re transferring may cause challenges with the existing water levels in the canal.”*

2.6.2 The model outputs, and the underlying assumptions and methodology, have not been published so the reader, and IWA, has no understanding of how the levels vary with flow or of whether the assumptions and methodology are realistic and appropriate.

2.7 P48 – pumped bypasses

2.7.1 *“Step 1: Water enters the pumped bypass via an inlet structure located on the canal bank. The inlet consists of a trash screen and weir. This helps maintain water levels downstream in the canal, diverting water safely into a pump chamber.”* This is clumsy phrasing. When the pumps are operating, the inlet is at the downstream end of the canal pound and there is no canal downstream of the inlet.

2.7.2 *“Step 2: Pumps will adjust their strength to match the level of incoming flow.”* This seems unlikely, but not impossible, as the incoming flow to the inlet, under stable conditions, is going to be dictated by pump output. Incoming flow could be measured at Atherstone inlet and the pumps in the system adjusted to align with that (with further adjustment where backpumping is required). As discussed elsewhere in this response, a comprehensive study of water management and control is required, with suitable detail placed in the public domain.

2.8 P55 – gravity bypasses

2.8.1 As no technical drawings or diagrams are provided, it is difficult to understand what is being proposed. The Gravity Bypass Factsheet (dating from 2024?) on the GUCT website provides some information and states that *“We’ll share more detailed design updates and potential mitigation suggestions at the next round of consultation, currently planned for early 2026”*; IWA has found no such detailed design updates in the consultation documents.

2.8.2 The normal arrangement for a gravity bypass is to have an uncontrolled fixed weir with a crest length suitable to maintain water levels within design limits. This what is described on the Factsheet and is shown on the P60 visualisation. The purpose of the adjacent control building shown on the visualisation is not apparent.

2.8.3 The GUCT proposals mention control valves (not adjustable crest gates, and not paddles) and control buildings. This tends to suggest some sort of low level outlet. The absence of data raises numerous uncertainties relating to water velocities and what happens to water levels in the canal upstream if the valve jams in the open position while the flow in the transfer reduces or ceases. As discussed elsewhere in this response, a comprehensive study of water management and control is required, with suitable detail placed in the public domain.

2.9 P56 – Whilton Lock bypasses

2.9.1 *“We’ll look carefully at how we can route this pipeline and will be considering the use of trenchless crossing techniques in this area.”*

2.9.2 IWA observes that trenchless techniques in the vicinity of historic locks of unknown underground structural dimensions and with various culverts and associated paddle structures, also of unknown locations and dimensions, is likely to be challenging with the risk of damage to existing infrastructure and potential for breach.

2.10 P66 – transfer locks

2.10.1 As the transfer locks will be rarely used and will be left open most of the time, those on the narrow canals should be made wider than a normal narrow lock or stop lock for ease of navigation. The visualisation of a transfer lock does appear to show it wider than a narrowboat, but the detailed designs should allow for an unobstructed channel width no less than the normal width through bridges, of 3 to 4 metres. This is also necessary to avoid a restriction on flow with increased flow velocity and head loss.

2.11 P69 – bank raising

2.11.1 There appears to be uncertainty as to the extent of bank raising required; it is not explicit whether this is due to incomplete hydraulic modelling, incomplete bank survey, or a combination of these factors. However, these matters should be complete and available for public review prior to initiating the DCO process.

2.11.2 The Map Book shows the current estimated extent of bank raising which, even with the transfer locks, is still extensive and said to total approximately 20 kilometres. No water levels or bank heights are given at any locations but the majority of bank raisings are said to be between approximately 100 and 250 millimetres (Brochure p.69).

2.11.3 The Development & Options Report (at 7.6.4) states:

“The general design principle for the extent of bank raising is to ensure that, a minimum of 150mm of freeboard of a sufficiently robust nature is in

place when the water transfer is occurring at the maximum 115ML/d flow level and approximately 250mm during maximum ‘business as usual’ transfer rates of 80ML/d when the transfer locks are open. This freeboard level is considered sufficient to manage the implications of increased water levels and wave surges. Some limited exceptions to this general principle may be made in circumstances where providing such a freeboard level is considered problematic due to existing canal operations or environmental sensitivities.”

- 2.11.4 Given that most canals were originally designed with a minimum of 1 foot (300mm) freeboard to safely cope with rainstorms, wind driven waves, etc, and usually 18 ins (450mm) or more wherever levels are expected to be less stable (on short pounds between locks, near feeder inflows, etc) for the GUCT to provide only 150mm freeboard, or at best 250mm, on bank raising sections, and the suggestion of even lower ‘limited exceptions’, seems to provide a significant reduction in safety margins and consequent increase in risk of overtopping and potentially breach.
- 2.11.5 Chapter 10 of the PEIR (Climate Change) discusses the effects of increased frequency and intensity of extreme storm events on bank erosion, sediment build up, bridge scour, and debris but not the need to at least maintain if not increase freeboard. It misleadingly says that bank raising will maintain a minimum freeboard to prevent overtopping whereas a reduction in freeboard is actually proposed¹. IWA considers that the bank raising works should at least maintain existing minimum freeboard and ideally should increase freeboard to address any perceived increased flood risk due to climate change or otherwise.
- 2.11.6 Chapter 22 of the PEIR (Flood Risk) notes that bank raising works have the potential to impact the stability of canal embankments and to increase the risk of structural failure. IWA considers this to be unacceptable and that detailed engineering design should ensure that all embankment stability is maintained or, better, improved to modern standards.
- 2.11.7 The brochure describes “*three types of bank raising*”: towpath side hard bank; offside soft bank; and masonry washwalls (although the Options report at 7.6.1 also lists a fourth as walls forming part of buildings on the canal edge). In reality there will be many more situations and complications to be addressed – IWA has identified 24 separate types of bank raising.
- 2.11.8 During the online event on 24 March 2026 (timed at 37:45 to 39:00 in the recording), it is suggested that bank raising is essentially the same as normal bank repairs. IWA points out that wherever canal water level is above surrounding ground level, the watertight core of the embankment will need to be raised, towpath width will need to be maintained (or possibly widened to current DDA standards), while the overall stability of the embankment will be adversely affected such that it may be necessary

¹ In other words, the future minimum freeboard is proposed to be less than the current minimum freeboard.

to strip the external topsoil and vegetation and then add additional material across a larger footprint to ensure adequate stability to modern design standards. Some of these issues may also apply even when canal water level is below surrounding ground level.

2.12 P70 – Peartree Bridge

2.12.1 Only one bridge is said to need raising: Peartree Bridge 88 in Milton Keynes. There is no information on what minimum headroom has been used to assess bridges, or by how much this one falls short. As a brick arch bridge it is somewhat disingenuous to say “*we may need to make some adjustments*” when “*increasing the height of the bridge span*” requires demolition and “*reconstruction of the bridge*” to heritage standards.

2.13 P71 – adjustments to existing weirs

2.13.1 “*Water levels will rise marginally as part of the scheme, so we may need to make some adjustments to these existing weirs. This is to make sure water can move efficiently through the canal and for flow to be controlled when canal water levels are raised.*” As noted under bank raising, water levels may rise by up to about 250mm, which IWA does not consider to be a marginal increase.

2.13.2 “*For the majority of affected weirs, only minor work will be required and we wouldn’t expect any significant disturbance during construction.*” The consultation documents provide no drawings or descriptions of what these works may be, and no discussion of how the works may affect operational safety of the canal in future.

2.13.3 “*There are up to 17 weirs along the route which will require more substantial work.*” The consultation documents provide no drawings or descriptions of what these works may be, and no discussion of how the works may affect operational safety of the canal in future.

2.13.4 “*We propose to fit a number of these weirs with new tilting weirs, which are automated to enable greater control over this section of the canal.*” It is not apparent whether this is a proposal to fit tilting crest gates to existing weirs or to demolish weirs and install tilting weirs in their place. As with any moveable control structure, studies are required to ensure that the installations fail safe under all scenarios.

2.13.5 “*We’ll assess the weirs on a case-by-case basis taking into account their setting, such as any heritage designations, to determine the most appropriate way to undertake the necessary work.*” It is apparent from this statement that the engineering is incomplete and that the approach to be adopted is thus unknown. The relevant studies should be completed and issued for consultation before the DCO process commences.

2.13.6 There is no discussion of how spill weirs may need to be re-engineered to cope with the surplus flow upstream of a failed pump-station (or of how the control system would manage upstream pumps, potentially back to Minworth, in such an event).

2.14 P70 – Daventry and Drayton Reservoirs

- 2.14.1 *“We’re proposing to keep the reservoirs full until they’re needed.”* While this sounds attractive, it may have significant downside. These reservoirs receive water from their catchments for much of the year, which is then supplied to the Grand Union Canal with the potential to distribute that water, by pumping or gravity, to other canals and arms. If the reservoirs are kept permanently full then there will be no available storage to take in water from rainfall events and normal stream flow, and much of that supply will need to be discharged to waste. This loss of gravity-fed water supply to reservoirs and thence the canal for normal operational consumption would need to be made up by pumping from Minworth. Evaporation and seepage losses would also increase due to due to maintaining the reservoirs full. These matters need to be addressed in hydraulic models and water management studies to identify an optimum water management regime. Note: during the meeting on 20 March, CRT and Affinity stated that the drafting was misleading – they were seeking to develop an optimised operating rule which would maintain the reservoirs fuller, but not full.
- 2.14.2 *“... the reservoirs will both still operate to ensure a supply of water for navigation to the canal.”* The meaning of “canal” in this context requires clarification. In accordance with the discussion relating to page 5, IWA hopes that this includes the Grand Union Canal towards London and Birmingham, the Oxford Canal to Oxford, the Northampton Arm and the various canals to Trent Junction, all of which can be (and historically have been) supplied with water from these reservoirs. In any event, it should be demonstrated that supplies to these canals will be no less than historically provided.
- 2.14.3 *“At Drayton Reservoir, ... we’ll install an approximately 350mm diameter siphon over the embankment to boost flows from the reservoir, when necessary.”* IWA assumes that this is to provide additional spillway or discharge capacity and has been accepted by the responsible reservoir panel engineer – this should be confirmed.

2.15 P79 – water storage site

- 2.15.1 The proposed Galley water storage reservoir will inevitably introduce evaporation and seepage losses which must be reflected in hydraulic models and water management studies.

2.16 P90 and P91 – land

- 2.16.1 GUCT will result in raised water levels within the canals. This in turn will raise the local groundwater levels and potentially cause water to back-up in any highway drains, agricultural drains or streams which discharge into the canal just above historic water levels. IWA has not identified any discussion of the related issues in the consultation document.
- 2.16.2 Where banks are raised, any underlying embankment or slope may need to be stabilised requiring additional land take. IWA has not identified any discussion of this issue in the consultation document.

2.17 P96 – construction, operation and maintenance

- 2.17.1 Construction works in canals and on adjacent banks are commonly constrained by timing constraints set by the Environment Agency to protect wildlife, yet the consultation document does not appear to address such timing constraints (if present, the water vole illustrated on P99 might preclude bank works in winter which is when such works are currently proposed).
- 2.17.2 The consultation document says almost nothing about how the canal and pipeline sections of the transfer are to be operated, and not much about how the treatment plants are to be operated. Prior to the DCO process there needs to be some public review and discussion about how the scheme is to be operated and maintained (and for how long), in particular the arrangements to understand how the flow and resulting water levels may vary, the planned start-up and planned shut-down process, the emergency shut-down process, and how each individual control asset is engineered to fail safe.
- 2.17.3 The various canal bypass pump stations are mainly in rural areas, normally supplied with electricity via 11kV overhead power lines. Such power lines are typically shut down for several hours once or twice each year for planned maintenance and other reasons (both planned and unplanned). There is no discussion about how the transfer is managed under such circumstances.
- 2.17.4 *“It’s not anticipated that the scheme will result in more dredging requirements than what’s currently carried out as part of the general canal maintenance operations.”* See paragraph 2.2.5 above, which concludes: *“Overall this may be correct as the transfer scheme should not introduce more silt and other materials (except during construction). However, it is clear that dredging is likely to be required at different locations and times compared to present arrangements”.*

2.18 P97 to P101 - social and environmental commitments

- 2.18.1 P98 – The consultation documents, in particular Our Social Value Approach, emphasise *“communities”* and *“a place-based social value programme”*. The boater community is not mentioned; IWA emphasises that canal users, in particular boaters, are a community but are not place-based.

2.19 P109 – next steps

- 2.19.1 IWA is of the opinion that the engineering design for the scheme is so immature as to require a further round of public consultation before the DCO process commences.
- 2.19.2 IWA sees no reason why a summary of the Phase 2 feedback should only be issued after the DCO submission, about 15 months in the future. It should be quite possible to publish a summary of the feedback within 3 months.

2.20 P110 – timeline

- 2.20.1 There is no provision in the timeline for water management studies and only mention of design development rather than of a comprehensive engineering feasibility study and report which is required to demonstrate that the proposed scheme is even viable.

3 Scheme Development and Options Report

- 3.1 Section 1.4.2 states “Following Phase One Public Consultation, the scheme design and optioneering work that has been undertaken has largely consisted of identifying the appropriate works and infrastructure necessary along the canal network and further design development on those identified works and infrastructures.” While it is apparent that works have been identified, minimal information is provided about the resulting designs.
- 3.2 The document does not recognise that approximately 4-5% of the water entering the canal at Atherstone will be lost by evaporation, seepage, leakage and lockage.
- 3.3 Section 7.5.5 states “The ongoing identification of infrastructure and works was informed by modelling of the canal flows, to understand the hydraulics of the canal network and the likely implications of proposed interventions and works.” However, the document (and the other consultation documents) provide no description of the outputs from such modelling and do not demonstrate that the water transfer can be managed and controlled in a safe and effective manner, minimising spills to waste and ensuring that all infrastructure fails safe.
- 3.4 Section 7.6 discusses bank raising, apparently on the basis that this is the only available option, though it does record that further study is needed. As discussed elsewhere in this response, dredging in combination with a redefined maximum vessel draft and a lower limit of the Normal Operating Zone (NOZ) appears to have the potential to eliminate or reduce the need for bank raising. Alternatively, one might eliminate some or all of the proposed transfer locks. This approach should also reduce water losses from the canal and minimise the extent of reconstruction required at existing weirs.
- 3.5 Section 7.8.2 states that gravity bypasses require an inlet weir control building. Conventionally, gravity bypasses consist of a fixed weir with a crest length selected to suit the required flow rate and water levels. In such circumstances there is nothing to control and no mechanical or electrical systems that might fail. It remains unclear what is currently proposed for gravity bypasses.
- 3.6 Section 7.11 discusses weir upgrades. As discussed in 3.4 above, a dredging option, permitting the canal water level to be lowered when transferring water, may reduce the need for such upgrades.

4 Draft Design Principles

- 4.1 IWA has not found any mention of engineering design principles or design criteria in the Design Principles document or in any other consultation

document. IWA is of the opinion that a comprehensive engineering feasibility study and report, including a comprehensive suite of engineering design criteria, should be prepared and subjected to another round of consultation before commencing the DCO process.

4.2 Comments & Corrections

- Appendix P6. The headline statement is misleading. The GUCT canal corridor is not part of the Grand Union Canal and that was not “formed out of the Coventry, Oxford and Grand Junction canals”. The Grand Union does not include the Coventry Canal and takes in only a short section of the Oxford Canal. The corridor takes in parts of the Coventry, Oxford and Grand Union Canals.
- Appendix P11. Atherstone. “a flight of two locks” should read “a flight of eleven locks”.
- Appendix P15. The map shows Braunston as a Gravity Bypass but it should be a Pumped Bypass.
- Appendix P18. In the final line of text, delete “narrow”.
- Appendix P19. Two references to the “Stratford Cut” should be to the “Old Stratford Arm”. Note that the map on this page doesn’t show Cosgrove and relates to the following page.
- Appendix P21 and P22. These lengths of canal no longer form part of the project so these pages are redundant.

5 Our Social Value Approach

5.1 P6, P7, P8 – our approach to social value

- 5.1.1 *“While securing a resilient water supply remains the primary objective, we’re equally focused on creating a lasting legacy by developing initiatives that deliver positive outcomes for local communities and canal users, well beyond the construction phase.”*
- 5.1.2 *“Together, we’ll collaboratively aim to deliver vital support in a way that enables long-term resilience and ensures the social value created is both meaningful and enduring for communities and canal users.”*
- 5.1.3 **“Resilience** *Providing a reliable water supply to the Southeast and a resilient canal transfer route for the water”*
- 5.1.4 While IWA accepts that the transfer should benefit canal users along the canal transfer route between Atherstone and Great Brickhill, this must not be at the expense of canal users elsewhere on the canal network.
- 5.1.5 *“It’s important that the scheme makes a positive contribution by leaving the natural environment in a better overall state than before it’s implemented.”*
- 5.1.6 Ensuring increased water supplies to other parts of the canal network should leave the natural environment in a better overall state; reducing water supplies to other parts of the canal network will certainly degrade the natural environment.

5.2 P9 – embedding social value

- 5.2.1 The timeline on P9 shows the next three activities to be Concept Design, Developed Design and Technical Design, the last of these to include further stakeholder engagement (public consultation).
- 5.2.2 IWA would be supportive of this approach, which aligns with the approach set out under KEY CONCERNS. However, the approach does not align with other timelines shown elsewhere in the consultation documents.
- 5.2.3 CRT and Affinity provided a clarification on 20 March. However, having re-read the consultation document, IWA stands by the comments above.

5.3 P10 – delivering social value through design

- 5.3.1 *“During design and construction, social value delivery will be prioritised in communities that are most impacted by the works and where there’s identified need and opportunity to deliver meaningful outcomes.”*
- 5.3.2 IWA emphasises that canal users, and boaters in particular, are a community that must be recognised during the design process.
- 5.3.3 IWA also notes that CRT, as a promoter of the scheme and owner of the canal, has a conflict of interest when it comes to representing canal users, so greater note must be taken of other organisations representing canal users.

5.4 P11 to P15 – Proposed social value opportunities identified to date

- 5.4.1 This page emphasises the adoption of a *“place-based social value programme”*. Canal users are not place-based; the approach to social value should be adjusted accordingly.
- 5.4.2 One of the proposed *“regional legacy groups”* should focus on canal users. As suggested by the word *“regional”*, all the presently suggested groups are location specific.
- 5.4.3 Similarly, canal users should be recognised as one of the affected communities.

6 Phase 1 Public Consultation Report

- 6.1 A minor comment relating to Appendix A. As well as the national IWA response, the IWA Lichfield Branch and the IWA Northampton Branch both responded to the previous Public Consultation in 2024. Those branches have also contributed to this national IWA response.

7 Statement of Community Consultation

- 7.1 No comment

8 Preliminary Environmental Impact Report, Volumes 1-4

8.1 Cultural Heritage (Volume 1, page 21; Volume 2, Chapter 11)

- 8.1.1 This section has been reviewed by the IWA Heritage Advisory Panel (HAP).

- 8.1.2 Exact proposals regarding specific heritage assets are required before HAP can comment in much detail. In general, HAP is in favour of the project, considering that the benefits should outweigh the disadvantages.
- 8.1.3 HAP notes that Affinity and CRT appear to be taking the heritage aspects very seriously and have catalogued the existing assets in some detail. Their commitment to adaptive re-use of existing assets where possible is encouraging so long as the work is done sensitively and fully explores the history of earlier uses, traces of previous equipment, etc. The Hawkesbury Junction Engine House is one such: previously dealt with carelessly, it would benefit from an industrial-archaeological investigation to properly assess its history, restoring lost features where practicable, to guide the design of the new use proposed.
- 8.1.4 Another important site is Stoke Bruerne. The proposal is that the gravity bypass should run through the presently incomplete western top lock. This lock currently displays the remarkable salvaged fore bay structure, horizontal paddle and associated gear, and cast iron gates salvaged from Welshpool lock on the Montgomery Canal. There is perhaps a case to be made for returning these to a good home on the Montgomery but in all events they should be carefully handled and preserved.
- 8.1.5 Generally, raised water levels may lead to boat headroom (air draft) issues at some historic bridges (Peartree Bridge 88 is highlighted) and these will have to be handled carefully, with near-exact rebuilding or alteration using original materials whenever possible.
- 8.1.6 HAP also notes the desire of Affinity and CRT for the existing architectural character of the waterways to inform new structures. That sounds good in principle but is actually quite tricky to achieve. Every period makes its own future heritage. Better to have a good honest modern structure appropriate to the functionalist tradition of the waterways than a poor attempt at replicating the past.
- 8.1.7 HAP would like to understand the process of appointing architects and engineers to the project, both for conservation/reuse and for new structures. Architects and engineers involved should be conservation accredited through a relevant professional organisation. Highly sensitive locations may suggest an individual response but broadly speaking, for new structures a consistent approach and aesthetic is desirable, to mark what will be a historically important phase in the life of these waterways.
- 8.2 Groundwater levels and drainage (Volume 1, pages 24 and 32; Volume 2, Chapters 14 and 22)**
- 8.2.1 The consultation does not appear to mention that raising the canal water level will raise water levels in nearby ground, building basements, drains, feeds and streams, with potential adverse effects on landowners. In addition, any drainage pipes (highway, agricultural or other) that become drowned out by the raised water levels may be subject to increased risk of blockage. There might also be adverse effects on any oil/fuel interceptors on highway drainage discharging into the canal.

- 8.2.2 AECOM has clearly sought to identify all the drains, streams and feeds discharging water into the canal, but has apparently only examined the effects of these inflows on the canal (mainly in terms of water quality and contamination). There needs to be study of the impact of raised canal water levels on the drains, streams and feeds; in most cases these impacts will be negligible, but may be material in a few cases.
- 8.2.3 In low flow conditions in the Rivers Tame and Trent, the Environment Agency can impose ‘hands-off flow’ requirements that would reduce or stop the transfer from the Minworth AWTP for up to 8 days (paragraph 3.8.3). The Daventry and Drayton reservoirs are said to then provide six days’ water storage to support the transfer and navigation in the canal. The Galley reservoir may provide a further 8 days of public water supply, but no contribution to support navigation in the canal. There is no discussion of how, in such circumstances (and in the period leading up to such circumstances), the available water resources would be allocated between keeping the canal in water (required for long term security of the canal), transfer and navigation. Such matters should be addressed in a water management report.
- 8.3 Major Accidents and Disasters (Volume 1, page 27; Volume 2, Chapter 17; Appendix 17-PD-1).**
- 8.3.1 There is mention of risk of breach during bank raising but no apparent mention of risk of breach while thrust boring beneath the canal or while excavating trenches for bypasses or works at any other location (such as aqueducts) where canal water level is significantly above surrounding ground level or working level. Such risks would lie with the contractor and would probably be classified as “scope out”, but they should be mentioned in the long-list of risks in the Appendix.
- 8.3.2 IWA is of the opinion that, in the event of a breach or many of the other major accidents and disasters identified, considerable reputational risk, and residual financial risk, would lie with CRT and Affinity, even if the event is the contractual responsibility of others; this should be recognised and addressed in future documentation.
- 8.4 Socio-Economics (Volume 1, page 30; Volume 2, Chapter 20 – note that table of contents does not align with file name and document title).**
- 8.4.1 The Chapter on socio-economics addresses effects across the “canal network”. Chapter 20, at pages 8 and 9, states that impacts across the canal network are within scope. Paragraph 20.5.9 states “*The study area for effects on recreational, leisure, and commercial users of the canal is the canal network itself.*” Table 20-3 then limits the study area to “*Sections of canal / waterway within or adjacent to the Preliminary Order Limits*”.
- 8.4.2 The term canal network is not defined in the consultation documents. In general public usage, the UK canal network is understood to be the historic system of man-made navigable waterways covering

approximately 2,000 to 2,500 miles of canals (excluding about 2,500 miles of navigable rivers).

- 8.4.3 IWA accepts that it would not be reasonable to require GUCT to study impacts across the entire canal network. However, canal users can reasonably expect the socio-economic effects to extend into lengths of the canal network which are hydraulically connected to and provided with water from the transfer (see Appendix A for list). All these can reasonably be considered to be adjacent to the Preliminary Order Limits.
- 8.4.4 While any increase in water supplies to these canal lengths will be welcome, with beneficial socio-economic effects, any diminution of water supplies is likely to give rise to material adverse effects. As noted in KEY CONCERNS, there is currently no hydraulic modelling and water management report in the public domain to demonstrate that water supplies to these lengths of canal, particularly in drought conditions, will not be reduced.

APPENDIX A

WATER MANAGEMENT CONSIDERATIONS

9 Increased losses of water from the canals between Atherstone and Great Brickhill arising as a result of GUCT

9.1 It is assumed that Affinity, CRT and their consultants will have data allowing precise modelling of losses under a wide range of circumstances. A simplistic analysis was undertaken by IWA in September 2025 using the following basic assumptions.

- Transfer operating at 115 ML/day
- All water levels in the affected lengths of canal increased by 100mm as a result of the transfer.
- The affected lengths of canal are the Grand Union from Stoke Hammond Lock to Calcutt Top Lock including the spur to Watford Locks, the Northampton Arm to Rothersthorpe Top Lock, and the Buckingham Arm; the Oxford Canal from Braunston Junction to Hawkesbury Junction and from Napton Junction to Napton Bottom Lock; the Coventry Canal from Coventry to Atherstone Top Lock; and the Ashby Canal.
- Boat traffic typical for August

9.2 Losses fall into the following categories.

- Evaporation. Assuming a trapezoidal canal section throughout, a 100mm rise in water level will result in a 200mm increase in canal width at water level, with consequent increase in evaporation.
- Seepage. Assuming groundwater level is below the canal lining, with a normal water depth of 1.5m, a 100mm increase in water level will increase the differential head driving seepage losses from 1.5m to 1.6m, with corresponding increase in seepage losses
- Water is lost from the affected lengths by gravity at the locks at Atherstone, Calcutt and the Northampton Arm. With a 100mm increase in water level on the upstream side of each of these locks, there will be a corresponding increase in lockage water consumption on each lock cycle, and a corresponding increase in leakage through and around the lock gates due to the increase in differential head.
- The calculated increase in losses from these assumptions was just over 3.5 ML/day
- There will be seepage and leakage losses from Daventry and Drayton reservoirs. In the absence of adequate information to assess losses, additional losses of 0.35 ML/day (10%) were assumed

- Rounded this gave total additional losses of about 4 ML/day, about 3.5% to 4% of the nominal 115 ML/day transfer. This conclusion was shared with CRT in September 2025.

9.3 The 2026 Phase 2 consultation document proposes that Daventry and Drayton reservoirs should be maintained full at most times. These two reservoirs receive water from their catchments for much of the year, which is then supplied to the Grand Union Canal with the potential to distribute that water, by pumping or gravity, to other canals and arms. If the reservoirs are kept permanently full then there will be no available storage to take in water from rainfall events and normal stream flow, and much of that supply will need to be discharged to waste. This loss of gravity fed water supply to reservoirs and thence the canal for normal operational consumption would need to be made up by pumping from Minworth. Evaporation and seepage losses would also increase due to due to maintaining the reservoirs full.

9.4 The 2026 Phase 2 consultation document also introduces Galley reservoir, which will also suffer from evaporation and seepage losses.

9.5 Arising from the above considerations, IWA considers it essential that Affinity, CRT and its consultants prepare comprehensive estimates of water consumption and water losses under a representative range of operating conditions and times of year. In future rounds of public consultation, the documents must make explicit whether the nominal transfer capacities are those volumes of water leaving Minworth WTP or those volumes of water arriving at Galley WTP. The documents should also provide a summary of the consumption and losses anticipated under a range of operating conditions to ensure public understanding of what is proposed.

9.6 Thereafter, commercial agreements between the various parties must recognise that these losses occur, that the estimates of losses are not accurate, and that costs of providing water to maintain the reservoirs and canals at normal operating levels are to the project account, not to the account of CRT. The existence of such agreement, and ideally the terms of the agreement (which do not appear to be particularly confidential), should be in the public domain.

10 CRT's capability to transfer water to other parts of the canal network by gravity or pumping

10.1 CRT has the capability to transfer water from the GUCT to the wider canal network by both gravity and pumping:

- By gravity at Atherstone to the northern Coventry Canal and thence to Shardlow (near Trent Junction between Derby and Nottingham) via the Birmingham & Fazeley Canal and the Trent & Mersey Canal; at Calcutt to the northwestern Grand Union Canal to Warwick; and at Gayton Junction to the Northampton Arm.
- By pumping at Stoke Hammond to the southern Grand Union Canal and thence to London; at Napton to the southern Oxford Canal and

thence to Oxford; and at Norton Junction to the Leicester Arm to Leicester.

- 10.2 IWA understands that the present pumps are primarily sized to backpump lockage and leakage at locks, though there is capacity to transfer more if pumps are run for longer periods of time. Lockage can be assessed from lock dimensions and lock usage counters, but leakage is not easy to assess and varies with the quality of lock maintenance. IWA has no information about what volumes of water have been pumped to the wider network in the past, though such information may be available from flow meters or pump running hour records.
- 10.3 IWA also has no information about what volumes of water have been transferred by gravity to the wider network, whether by lockage, leakage or deliberate releases; in this case it is not apparent how such volumes may have been recorded.
- 10.4 IWA considers it essential that CRT creates a record of historic transfers from the GUCT length to the wider canal network, including an assessment of circumstances and timings at which such transfers are made, together with a set of rules to cover future transfers from GUCT to various connected canals and arms (to London, Oxford, Northampton, Leicester, etc) with sufficient analysis to demonstrate that the transfers are comparable to the historic situation or will improve in future. A summary of these records, rules and analysis should be placed in the public domain to ensure public understanding of the historic and future situations.
- 10.5 Recognising the difficulty of creating an historic record of transfers, IWA suggests an alternative concept which adopts the approach of guaranteeing adequate water supply to the canal network except during defined drought periods. IWA expects CRT to have historic records, for each canal, of the dates during which navigation has been suspended due to water shortages. The Met Office's Hadley Centre provides, updated daily, an average daily precipitation record for Central England (<https://www.metoffice.gov.uk/hadobs/hadukp/data/download.html>). This record dates back to 1931. IWA suggests that it should be possible to calibrate closure start dates (or better, a notice date about a week earlier) against cumulative rainfall over a suitable preceding period (of about 90-180 days, which period may differ for each canal and each month), and then to calibrate closure end dates against cumulative rainfall since the closure commenced. From this a set of rules could be created setting out in terms of cumulative rainfall the circumstances in which GUCT would cease to supply water to the various connected canals and arms.
- 10.6 Thereafter commercial agreements between the parties should ensure that CRT is entitled to abstract water from the GUCT under defined conditions. IWA envisages that a basic level of transfer, in line with historic transfers and gravity lockage and leakage, should be available with no charge to CRT for the water abstracted, while additional abstractions, to the extent that water is available from Minworth or elsewhere, would be on commercial terms. The

existence of such agreement should be in the public domain, together with the non-confidential technical details of the amounts and locations available for transfer.

11 GUCT water management and control

- 11.1 The GUCT Phase 2 consultation documents say very little about how flows of water are to be controlled, and nothing about the overall management of water transfers. The few references to flow control suggest an intention to use upstream control systems at each bypass, and elsewhere. In that approach water is pumped into the canal at Atherstone and downstream valves and pumps gradually operate as the local water levels change. However, water level changes are not instantaneous. IWA estimates that effects from a change of inflow at Atherstone will take about 11 hours to be noticeable at Great Brickhill (CRT, Affinity and their consultants should be able to assess this delay period much more accurately).
- 11.2 IWA suggests that some form of dynamic management and control system would be more appropriate with both centralised and local control of pumps, valves and control structures. Central control so that the system can respond instantaneously to flow changes (such as a pump failure at one pump station resulting in other pump stations being instructed to reduce or cease pumping) and to provide for management override. Local control so that systems respond correctly in the event of communication failure with the central control system.
- 11.3 Whatever management and control system is adopted, pumps, valves and control structures must fail safe in all circumstances. While spillage of surplus water to waste is acceptable (from a safety perspective), the canal must never drain down resulting in the grounding of boats.
- 11.4 IWA considers it essential that Affinity, CRT and its consultants place in the public domain substantive description of the proposed management and control systems, including monitoring instrumentation, to ensure public understanding of and confidence in whatever is proposed.

APPENDIX B

NOTES ON HYDRAULIC GRADIENT, FREEBOARD & DREDGING

12 Hydraulic Gradient

Water transfer via a canal requires a hydraulic gradient to be created in each pound to drive the required flow of water. This can be achieved by raising the water level at one end of the pound or by lowering the water level at the other end of the pound or both methods can be used in combination.

The necessary gradient will vary with channel size and shape and with the flow rate, but the engineering needed to accommodate this should be based on the maximum required flow rate and therefore the maximum head and gradient. In addition, the engineering should consider conditions at zero flow and at an appropriate range of intermediate flows. The hydraulic gradient (and corresponding grade line) is fundamental for designing and analysing open-channel systems.

In canals the hydraulic gradient is affected by friction losses along the channel, which is complicated in practice by varying vegetation cover, by varying cross-sections, and by constrictions at bridges and other narrow sections. There are established equations and methodologies to help calculate gradients in such varying real-life situations but the results need verification against practical experience and knowledge.

CRT should have the data on existing flow rates, water levels and weir levels to characterise the current situation on the Coventry, Oxford and Grand Union Canals. At present the existing flow on the Coventry and North Oxford canals is northwards to feed the locks at Atherstone, but this will be reversed by the GUCT. On most of the Grand Union Canal the water flow will be in the same direction as at present, and the channel cross-section area is greater than on the two narrow canals, so the required hydraulic gradient for GUCT should be less. CRT will also have data on the Llangollen Canal which was adapted to carry a similar water transfer flow rate.

Clearly, the exact figures are critical to determining future water levels and hence the design of the engineering work to banks, weirs, locks and other structures necessary to accommodate these level changes for the scheme to function as required. IWA has several times requested the gradient being used in hydraulic modelling for the scheme (June 2025, November 2025, March 2026); an answer was offered but has not been provided.

The hydraulic grade line is particularly important on the longer pounds where water levels changes of up to 0.3 metres at Atherstone were predicted at an early stage (July 2023 Workshop). To reduce the maximum height of the water level changes on the longer pounds, and thereby the height and extent of the bank raising and other works proposed, transfer locks were later added to the scheme. Three or four are currently proposed on the longer pounds (Atherstone to Hawkesbury, Hawkesbury to Hillmorton, Whilton to Stoke Bruerne, and possibly Cosgrove to Fenny Stratford).

However, the assumption throughout has been that water levels will be raised at the upstream end of each pound, rather than lowered at the downstream end.

13 Freeboard

Raising the canal water level may require the canal banks and weirs (and possibly bridges and lock structures) to be raised to maintain freeboard and headroom. But as noted elsewhere, the design principles for GUCT would not maintain existing historic freeboard standards which would increase the risk of overtopping and breaches, posing an unacceptable risk to the structural integrity, resilience, and safety of the canals and their users.

14 Dredging

An alternative to raising the water level and banks at the 'upstream' end of each pound is to lower the water level at the 'downstream' end. In the case of GUCT it appears that this can be achieved without reducing the usable depth of the navigation channel by dredging to the original bed profile. Since the end of commercial carrying, and the preponderance of shallow draught leisure boats, canals have not been dredged to their original construction depth and there may be 0.3m or more depth of silt that could be removed to reinstate their original heritage dimensions. CRT conducts periodic detailed surveys of channel depths to inform dredging requirements so should be able to quantify this quite accurately.

As detailed in IWA's Water Transfer Guidelines bank raising is not technically simple. It will also be costly and has structural stability and safety risks, heritage impacts, and requires navigation stoppages. By contrast, dredging is a well understood operation with predictable costs. Where there is a choice between dredging a downstream section of canal and bank and weir raising on an upstream section the overall advantage of cost, and predictability of cost, is most likely to lie with the dredging.

It is therefore concerning that the benefits of dredging have not been addressed since the inception of the GUCT scheme and, on questioning, have been characterised as just an operational back-up option.

So far, the scheme design has accommodated the necessary gradient and water level changes by firstly raising banks, then introducing transfer locks, and only considering dredging as a last resort. IWA considers that this should be reversed. The GUCT engineering priorities should be firstly to maximise dredging in order to enable water level rises to be minimised, then secondly to add the transfer locks to further reduce the extent and height of bank raising, with any residual bank raising required specified to fully maintain original design freeboard at maximum flow rates.

- END -