United Utilities

Habitats Regulations Assessment of the draft Water Resources Management Plan

Addendum to draft Habitats Regulations Assessment

AMEC Environment & Infrastructure UK Limited

November 2013

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AMEC Environment & Infrastructure UK Limited

November 2013

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Executive Summary

Under the Water Act 2003 all water companies must publish a Water Resources Management Plan (WRMP) that sets out their strategy for managing water resources across their supply area over the next 25 years. United Utilities published its draft WRMP (dWRMP) in March 2013, which identified United Utilities' preferred solutions for resolving a predicted deficit within its West Cumbria Water Resource Zone (WRZ). These potential solutions were:

- Preferred Option - WC01: Thirlmere Transfer into West Cumbria;
- Alternative Option - WC14d: Kielder Water Transfer to West Cumbria (Treated near Carlisle);
- Lowest Cost Option - (a combination of: WC04: Wastwater (negotiate part abstraction licence); WC05a: Development of New Boreholes in West Cumbria Aquifer (10 Ml/d); WC09: Development of Boreholes in North Cumbria Aquifer[1];
- The selection of potential solutions and preferred option in the dWRMP was informed (in part) by a draft Habitats Regulations Assessment (HRA)[2], which identified those options with a risk of 'significant' or 'adverse' effects on a European site.

United Utilities has carried out further investigations and feasibility studies and more detailed engineering scopes, following submission of the draft WRMP. These Level 2 scopes include more detailed information on the infrastructure requirements, such as further consideration of pipeline routes or treatment processes, that would be required if the options were to be implemented. This Addendum reviews the revised engineering scopes, and identifies and assesses any changes that could alter the conclusions of the draft HRA. It also documents the assessment of potential 'in combination' effects with adjacent water company WRMPs, which could not be completed at the draft HRA stage, and addresses specific comments on the draft HRA raised by statutory consultees during the consultation process. The Addendum therefore complements the draft HRA and should be read in conjunction with this document.

The Addendum concludes that:

[1] WC19 (Crummock Automated Compensation Control) was originally included in the draft WRMP lowest cost option set. However, as a result of additional water resources modelling, we have identified that this option and the transfer pipeline to take this water to the areas currently served by Ennerdale are not required.

[2] The *Conservation of Habitats and Species Regulations 2010* (as amended) (the 'Habitats Regulations') require that competent authorities assess the potential impacts of plans and programmes on the Natura 2000 network of European protected sites to determine whether there will be any 'likely significant effects' (LSE) on any European site as a result of the Plan's implementation (either on its own or 'in combination' with other plans or projects); and, if so, whether these effects will result in any adverse effects on the site's integrity. The process by which the impacts of a Plan or Programme are assessed against the conservation objectives of a European site is known as Habitats Regulations Assessment (HRA).

- the revisions to the preferred option (Option WC01) and the alternative options (Option WC14d and the Lowest Cost Option) will have no additional effects compared to the originally assessed schemes and the conclusions of the draft HRA remain valid; and

- the options will have no likely significant effects on any European sites in combination with other water company WRMPs.

Therefore, assuming that:

- Option WC01 (as assessed) remains the preferred option in the final WRMP; and

- the best-practice and bespoke mitigation and avoidance measures set out in Appendix G of the draft HRA are referred to or otherwise incorporated into the WRMP; and

- project-level HRA is completed by United Utilities for this option; and

- United Utilities commits to Option WC14d (or an appropriate review of the WRMP and available alternatives) should Option WC01 be shown to have unavoidable and unmitigatable adverse effects at the scheme level;

then **the final WRMP will have no significant adverse effects on any European sites, either alone or 'in combination' with other known projects, plans or programmes as a result of its implementation.**

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1. Introduction

1.1 The Water Resources Management Plan and Habitats Regulations Assessment

Under the Water Act 2003 all water companies must publish a Water Resources Management Plan (WRMP) that sets out their strategy for managing water resources across their supply area over the next 25 years. United Utilities published its draft WRMP (dWRMP) in March 2013. The dWRMP identified United Utilities' preferred solutions for resolving predicted deficits within its supply area.

United Utilities determined that only one water resource zone (WRZ), West Cumbria, is predicted to be in deficit within the 25 year planning horizon of the WRMP. United Utilities identified 'feasible options' for resolving the predicted supply/demand deficit within this zone, some of which could address the deficit on their own and some of which would have to operate conjunctively. Three different options for addressing the deficit in the West Cumbria WRZ (one of which comprises a combination of the feasible options) were identified in the dWRMP and taken forward for more detailed consideration. These options were:

- Option WC01: Thirlmere Transfer into West Cumbria (the preferred option);
- Option WC14d: Kielder Water Transfer to West Cumbria (Treated near Carlisle);
- Lowest Cost Option: (a combination of: WC04: Wastwater (negotiate part abstraction licence); WC05a: Development of New Boreholes in West Cumbria Aquifer (10 Ml/d); WC09: Development of Boreholes in North Cumbria Aquifer[3];

The feasible options were assessed using the principles of Habitats Regulations Assessment (HRA)[4], to identify those with a risk of 'significant' or 'adverse' effects on a European site that are unlikely to be avoidable or mitigatable at either the strategy or scheme-level. This assessment was then used by United Utilities to guide the selection of their preferred option.

The preferred option as presented in the dWRMP was Option WC01: Thirlmere Transfer into West Cumbria. Option WC14d (Kielder Water transfer to West Cumbria (Treated near Carlisle)) and the Lowest Cost Option set were also considered in the consultation exercise as viable alternatives and views were sought on each. These were

[3] WC19 (Crummock Automated Compensation Control) was originally included in the draft WRMP lowest cost option set. However, As a result of additional water resources modelling, we have identified that this option and the transfer pipeline to take this water to the areas currently served by Ennerdale are not required.

[4] The *Conservation of Habitats and Species Regulations 2010* (as amended) (the 'Habitats Regulations') require that competent authorities assess the potential impacts of plans and programmes on the Natura 2000 network of European protected sites to determine whether there will be any 'likely significant effects' (LSE) on any European site as a result of the Plan's implementation (either on its own or 'in combination' with other plans or projects); and, if so, whether these effects will result in any adverse effects on the site's integrity. The process by which the impacts of a Plan or Programme are assessed against the conservation objectives of a European site is known as Habitats Regulations Assessment (HRA).

retained as alternatives to the preferred option should future studies or data demonstrate that the Thirlmere option will have unavoidable adverse effects on a European site that cannot be mitigated or compensated.

1.2 This Addendum

Following submission of the dWRMP in March 2013, United Utilities has completed additional more detailed engineering scopes for the three options (Options WC01, WC14d and the Lowest Cost Option), to allow for more robust costing of the proposals. These more detailed scopes include more detailed information on the infrastructure requirements, such as further consideration of pipeline routes or treatment processes that would be required if the option were to be implemented. These scopes are available within the Environment and Social Costs Addendum document (AMEC 2013a) and the SEA Environmental Report Addendum (AMEC 2013b), and are summarised below. As the revised engineering scopes have some variations from the proposals within the dWRMP it is necessary to review the changes to ensure that:

- the conclusions of the draft HRA are still valid; and/or
- if changes are not minor, that the revised proposals will not have any significant or adverse effects on any European sites.

This Addendum report reviews the revised engineering scopes produced for the three options, and identifies and assesses any changes that could alter the conclusions of the previous HRA (**Section 2**). In addition, the Addendum documents the assessment of potential 'in combination' effects with adjacent water company WRMPs, which could not be completed at the draft HRA stage (**Section 3**). It also addresses specific comments on the draft HRA raised by statutory consultees during the consultation process; these are addressed in the relevant sections of the report and summarised in **Appendix B**. The Addendum therefore complements the draft HRA and should be read in conjunction with this document; conclusions on likely effects of the final WRMP are presented in **Section 4**.

Since the submission of the dWRMP, United Utilities has also identified additional feasible options that could be used as part of the 'Lowest Cost Option' to meet the predicted deficit, and an additional option involving effluent reuse (option WC25). These are not proposed for inclusion in the 'Lowest Cost Option' at this stage, but could be explored further in a future review of the WRMP. These have been screened in accordance with the methods set out in the draft HRA, and the results summarised in **Appendix A**, although it should be noted that this does not form a core component of the addendum and is primarily to inform United Utilities through future revisions of the WRMP.

1.3 Assessment Approach

This Addendum adopts the same method and assessment approaches used in the original HRA document (see Sections 3 and 5 of the HRA report (AMEC 2013c), and must be read in conjunction with this report. For each revised option the key changes are summarised, and then the conclusions of the original HRA reviewed. The assessment is revised where new European sites are likely to be affected, or where the effects of an option could change (e.g. if the revised option is significantly closer to a European site). The review concludes whether the

revised scheme (i.e. the scheme that will be included within the final WRMP) is likely to have any significant or adverse effects, alone or in combination.

2. Assessment of Engineering Revisions

2.1 WC01: Thirlmere Transfer into West Cumbria

2.1.1 Summary of original assessment

This option comprises the transfer of water from Thirlmere reservoir to the West Cumbria WRZ.

The option assessed at the dWRMP stage required over 100km of new pipeline, several new assets including a new WTW near Thirlmere (part of the River Derwent and Bassenthwaite Lake Special Area of Conservation (SAC)) and the closure / mothballing of three existing WTWs. Pipeline sections would cross / run adjacent to several European sites (including the River Derwent and Bassenthwaite Lake SAC, Clint's Quarry SAC, the Lake District High Fells SAC, and the River Ehen SAC) and the assessment identified risks of significant effects if the scheme were not suitably designed, controlled and mitigated.

A number of uncertainties surrounded the likely effects of construction, which would not be fully resolved until the completion of detailed design work; however, the assessment recognised that pipelines would be mostly within existing roads, with new WTWs and assets located on existing United Utilities operational sites where possible (although noting that some greenfield locations may be required). Scheme-specific mitigation measures could not be identified at the strategy-level, but normal best-practice measures would be implemented (unless scheme specific investigations demonstrate that they are not required) which can be relied on to prevent adverse effects occurring.

With regard to operation, the scheme is designed to relieve pressure on the River Ehen SAC. The scheme would operate within the terms of the existing licence (notwithstanding any licence consolidation that may take place), and therefore the current compensation release regime to the River Derwent would be maintained (i.e. there would be no change in low flows in St John's Beck as these are controlled by the compensation release).

The assessment noted that the scheme would reduce the size and frequency of the largest flows (the Q5 flows) from approximately 168.5 Ml/d to124.2 Ml/d, which would affect the St. John's Beck (and hence the River Derwent and Bassenthwaite Lake SAC). However, it was concluded that that the operation of the scheme would not have an adverse effect on the interest features or the integrity of the River Derwent and Bassenthwaite Lake SAC. This was because the practical effects of the reduction in high flows will be limited (the beck is already heavily regulated by the reservoir), and the existing low- and high-flow compensation regimes would be maintained[5]).

[5] United Utilities are required to maintain a low flow compensation release and also, on request from the Environment Agency, provide spate flows of up to 100 Ml/d to encourage salmon migration as part of the Environment Agency Restoring Sustainable Abstraction programme; the existing legal framework (Section 37 of the Manchester Corporation Act 1924) requires that these be provided.

2.1.2 Key changes to Option WC01

A summary of the main changes for Option WC01 since the publication of the draft HRA Report is provided in **Box 1** below

Box 1 What has changed since the Previous Assessment?

Key Changes in Option Scope

Option WC01 was assessed in the March 2013 draft HRA report. A more detailed engineering scope has been prepared, which has provided further details concerning the infrastructure requirements for this option. The revised option is similar to Option WC01 assessed in the March 2013 report. The main change has been confirmation of the pipeline size and routes, for example the route now passes to the north and east of Bassenthwaite Lake. The construction period has also increased from 2.25 to 6 years.

Changes in Likely Effects on European sites

The revised scheme will have no additional impacts (compared to the scheme assessed at the dWRMP stage) that are likely to significantly affect any European sites. The conclusions of the previous assessment (no significant effects assuming normal best-practice) remain valid and the option is (at the strategic level) a viable preferred option. Project-level HRAs are likely to be required if it is constructed but it is clear that the potential impacts on European sites can be avoided or mitigated at the scheme-level using established and reliable methods.

In summary, the key difference between the option assessed at the dWRMP stage and the latest engineering scope is that the route of the transfer main from Thirlmere to the Cockermouth area now passes east of Bassenthwaite Lake, rather than west as assumed in the assessment of the dWRMP. There are other minor changes in infrastructure requirements and pipeline routes but these do not significantly alter the likely impacts of the scheme. There would be no fundamental change to the operation of the scheme. The scheme as it is now proposed is detailed in **Box 2**.

Box 2 Option WC01: Thirlmere Transfer into West Cumbria – current scope of works

United Utilities currently hold a combined abstraction licence on the Thirlmere reservoir of 248.5Ml/d (split into a 5.5Ml/d licence for local supplies and 243Ml/d for the main draw off tower, from which the water supplies the Integrated Water Resource Zone). However, United Utilities currently do not have the capacity to abstract the entirety of the licensed water. This option involves increasing abstraction directly from Thirlmere within the current licence conditions by enhancing infrastructure capacity. The compensation release to the St John's Beck would remain unchanged. In order to distribute the additional water within West Cumbria, a number of infrastructure new build and upgrades would be required.

A new treatment works at the existing Thirlmere WTW site will be constructed to produce an average output of 60Ml/d. Through a series of service reservoirs and transfer pipelines (pumped and gravity) this output will also replace the output from existing works near Ennerdale, Cornhow, Quarry Hill and Buttermere. These works will be abandoned but secondary chemical dosing points will be retained as required. The following would be required:

- Water would be pumped into the new WTW and treated water transferred to a new SR near Keswick (60Ml capacity).
- New dual treated water mains to Cockermouth to then feed via new treated water mains to feed existing demands of Quarry Hill, Cornhow, Ennerdale, Buttermere,, new chemical dosing, new service reservoirs near Bothel Moor and Ennerdale.
- Abandon WTWs near Thirlmere, Buttermere, Quarry Hill, Ennerdale and Cornhow.

2.1.3 Revised assessment

Construction

There is one additional European site within 15km of the revised pipeline route: Drigg Coast SAC (this is the result of minor refinement near Cleator Moor). This site is now approximately 15km from the pipeline near Ennerdale (previously just over 15km distant), but is a coastal site located in a separate catchment and so is not linked by a potential impact pathway. The proposed scheme would have no effect on this site or its interest features, assuming normal best practice. One site, the North Pennine Dales Meadows SAC, is now further from the proposed pipeline route and the conclusions of the draft HRA in respect of this site remain unchanged.

There are two sites that are now closer to the pipeline route, or potentially more vulnerable impacts, than under the original proposal. These sites are identified in **Table 2.1** together with an assessment of potential effects.

Table 2.1 Previously assessed European sites closer to the new pipeline route than under the original proposals

Site	Interest Features	Assessment
Ullswater Oakwoods SAC	Western acidic oak woodland	This site was previously at least 10km from the proposed pipeline route between Thirlmere and Cockermouth; the new route along is now approximately 7km from the likely construction area. However, there are no reasonable impact pathways and this will not increase the vulnerability of the site to effects. No significant effects have been identified.
River Derwent and Bassenthwaite Lake SAC	River Lamprey; Brook lamprey; Sea lamprey; Oligotrophic to mesotrophic standing waters; Atlantic salmon; Marsh fritillary butterfly; Floating water-plantain; Otter; Water courses with Ranunculus-type vegetation	The revised route option requires crossings of tributaries and components of the River Derwent and Bassenthwaite Lake SAC at different locations due to the new pipeline route. In particular, the revised option will cross the Derwent at the mouth of Bassenthwaite Lake, as opposed to between Derwent Water and Bassenthwaite Lake. The river crossings clearly have the potential for significant and adverse effects on the European site, but the exact effects (and appropriate mitigation) can only be determined at the scheme-level. However, there is nothing in the scale or type of crossing to suggest that adverse effects are inevitable and cannot be avoided with normal mitigation measures. Furthermore, the relocation of one of the River Derwent crossings (from the Derwent between Derwent Water and Bassenthwaite Lake, to the northern end of Bassenthwaite) is unlikely to increase the risk of significant or adverse effects on any of the interest features and may reduce the potential for effects on some of the primary interest features, notably Oligotrophic to mesotrophic standing waters* and floating water-plantain *Luronium natans,* which are associated with Bassenthwaite Lake. It is therefore considered that the conclusions of the draft HRA remain valid for this scheme in respect of this SAC.

*Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*

Operation

The scheme will operate as originally proposed, and therefore the conclusions of the original HRA (no adverse effects) are still valid.

Natural England's consultation response broadly concurred with the conclusion of the draft HRA with regard to the operational effects of the scheme, but noted that the Environment Agency's review of the Thirlmere abstraction licence (2009) concluded that the licences were having an adverse effect on the River Derwent and Bassenthwaite Lake SAC due to (*inter alia*) the reduction in flow variability in St. John's Beck. Since the proposed scheme will reduce the frequency of the very highest flows (i.e. when reservoir is full and spilling) and the size of the Q5 flows (likely to be reduced from approximately 168 to 124 Ml/d) it is clear that flow variability will not necessarily be increased by the option[6].

However, Natural England also note that the concerns over flow variability were related to the flow requirements for migrating fish, and that the licence review did not identify any effects or potential effects associated with the highest flows: the RoC process considers the full use of the licence and did not require a change in the abstraction volume.

The Environment Agency has historically requested spate flows, including one in 2004 which was approximately 50Ml/d (in addition to the compensation flow). The RoC Site Action Plan for the River Derwent and Bassenthwaite Lake SAC (2009) noted that the "*expert opinion* [of the Environment Agency's Project Group] *was that this spate release was adequate for salmonid migration*". Arrangements are currently in place for the periodic release of up to 100Ml/d from Thirlmere under the Environment Agency RSA programme, which has been factored into the calculations for the option, and therefore it is certain that that the option will not affect the provision of these spate flows. Consequently, the key flow variability issue identified by the RoC (i.e. the availability of higher spate flows during the salmon migration period) will not be affected by this option.

The only residual uncertainty surrounding the option is associated with the potential effects of the reduction in the highest flows on the condition of the spawning habitats in the river – specifically, whether the reduction will affect the flushing of sediments from spawning gravels. However, sedimentation is not considered a significant issue within St. John's Beck (due in part to the presence of the reservoir) and no particular issues with sedimentation due to flow control have been identified historically or as part of the RoC process. Indeed, gravel supply to the beck (rather than sedimentation of existing gravels) was identified as a reason for the unfavourable condition through the RoC, and measures were proposed to resolve this including seeding of gravels to Helvellyn Gill. Spate flows to Helvellyn Gill would not be affected by this option (the presence and condition of the gravels in this beck is partly controlled by seeding and compensation release) and it is unlikely that the reduction in the very highest flows will have any measurable effect on the condition of the spawning gravels within the SAC. Gravel supply and condition is being monitored in any case as part of the RoC Site Action Plan (since seeding is being undertaken) and this will be sufficient to identify any future issues with the operation of the option.

Overall, the proposed changes to the abstraction regime are unlikely to significantly reduce the value of St John's Beck to salmon, or affect the favourable conservation status of this feature. Furthermore, any flow requirements identified by ongoing studies can almost certainly be achieved through appropriate regulation releases, which United Utilities would be obliged to implement under Section 37 of the Manchester Corporation Act 1924.

[6] Although it should be noted that flows could still be highly variable even if the range of variability is theoretically smaller.

Summary

The revised scheme will have no additional effects compared to the originally assessed scheme that are likely to significantly affect any European sites. **The conclusions of the previous assessment (no adverse effects assuming normal best-practice and typical project-specific mitigation) remain valid** and the Option WC01 is (at the strategic level) viable as a preferred option, although project-specific HRAs will be required if it is constructed.

2.2 WC14d: Kielder Water Transfer to West Cumbria (Treated near Carlisle)

2.2.1 Summary of original assessment

This option comprises the transfer of water from Kielder Water in the Northumbrian Water supply region to the West Cumbria WRZ.

The originally assessed option required (in summary) construction of a new water treatment works (WTW) facility located at the existing WTW site near Carlisle to treat Kielder Water and the transfer of treated water into West Cumbria. The output from this new WTW will replace the output from existing works near Ennerdale, Cornhow, Quarry Hill and Buttermere through a series of new service reservoirs and transfer pipelines (pumped and gravity). The old water treatment works will be abandoned but secondary dosing points will be retained as required.

The assessment work undertaken on the Kielder option demonstrated that, although potential pathways for significant or adverse effects would exist (the pipeline would almost certainly have to cross the River Derwent and Bassenthwaite Lake SAC, and the River Eden SAC at some point), all of these risks could clearly be avoided or mitigated using established measures and appropriate routing design. For the dWRMP, the primary pipeline from Kielder to Carlisle was located in a straight line (and hence across the Border Mires SAC), which was recognised as being unacceptable, but it was clear that this pipeline could be routed via existing roads and tracks to minimise the risk of impacts, with existing river crossing points used as necessary. United Utilities therefore indicated that the pipeline route would be sited within existing roads to minimise its environmental impact, unless scheme-specific routing studies demonstrated that alternative (non-road) routes would have no adverse effects on any European site.

With regard to operation, the scheme would use water available from Kielder within the terms of the existing abstraction licence, and therefore no sites within the Kielder catchment would be affected (all compensation releases etc. would be maintained). The scheme would be likely to marginally increase flows within water courses in the West Cumbria WRZ as water is used and passed through waste water treatment works (WwTWs), although this will only be a proportion of the daily transfer (some will be consumptive, much will be discharged to sea) and any changes will be negligible and within natural variations (assuming that the additional water is distributed and consumed in proportion to the current usage). Therefore, it was concluded that the scheme would have no significant effects on any European sites as a result of its operation.

Although the pipeline would be a large scheme the effects would be temporary and the assessment concluded that there was nothing to suggest that the option would be of a scale or type that could not be accommodated without significant effects. On this basis, and given the 'spare' capacity that it would introduce into West Cumbria (and potentially other WRZs in the future) this option was considered a suitable 'no significant effect' alternative to the Thirlmere option with respect to European sites.

2.2.2 Key changes to Option WC14d

A summary of the main changes for Option WC14d since the publication of the draft HRA Report is provided in **Box 3** below

Box 3	**What has changed since the previous assessment?**
Key Changes in Option Scope	
The main change to this option has been confirmation of the pipeline route from Kielder reservoir to Carlisle. Further clarity has been provided concerning the infrastructure required along the pipeline route. The construction period has also increased from 3 to 11 years. Capital and operating carbon has also been updated.	
Changes in Likely Effects on European sites	
The revised scheme will have no additional impacts (compared to the scheme assessed at the dWRMP stage) that are likely to significantly affect any European sites. The conclusions of the previous assessment (no significant effects assuming normal best-practice) remain valid and the option is (at the strategic level) a viable alternative to the preferred option. Project-level HRAs are likely to be required if it is constructed but it is clear that the potential impacts on European sites can be avoided or mitigated at the scheme-level using established and reliable methods.	

The key change to this option as a result of the latest engineering scope is that the pipeline route from Kielder to Carlisle has been routed via existing roads, specifically via minor roads from the eastern end of the reservoir and then along the main road to Carlisle. This will require additional pipeline construction and hence pumping etc. infrastructure on route, and minor changes to the capacities and locations of some pumping stations in the West Cumbria WRZ. However, it also ensures that the Border Mires SAC will be avoided by the pipeline route. The scheme as it now stands is detailed in **Box 4**.

Box 4	Option WC14d: Kielder Water Transfer to West Cumbria (Treated near Carlisle) – current scope of works

This option requires the construction of a new water treatment works (WTW) facility located at the existing WTW site near Carlisle to treat Kielder Water and the transfer of treated water into West Cumbria. The output from this new WTW will replace the output from existing works near Ennerdale, Cornhow, Quarry Hill and Buttermere through a series of new service reservoirs and transfer pipelines (pumped and gravity). The old water treatment works will be abandoned but secondary dosing points will be retained as required. Over 90km of pipeline is required to transfer the water from Kielder to Carlisle and over 110km of further pipeline to transfer from the new WTW into West Cumbria.

The option will enable the supply of the whole of West Cumbria from the Kielder Water source, via a new WTW (60Ml/day average, 80Ml/day max abstraction), which will provide the customers with a sustainable source which is estimated to be completed in 2030 (the end of AMP8).

The following would be required:

- New intake structure and screening at Kielder Water reservoir sized at 80Ml/d;
- New 80Ml/d raw water pumping station at Kielder Water reservoir;
- New twin raw water transfer pipeline from Kielder Water to Carlisle (80Ml/d) including new pressure break tanks and intermediate raw water pumping stations
- New WTW facility located near Carlisle (average output 60Ml/d). The new works will include three stage treatment, full sludge treatment and all ancillary services, including an 80Ml/d treated water transfer pumping station;
- New twin 80Ml/d treated water main from Carlisle to West Cumbria including new intermediate treated water pumping stations, new treated water mains to feed existing demands of Quarry Hill, Cornhow, Ennerdale, Buttermere, new chemical dosing, new service reservoirs for Bothel Moor and Ennerdale areas.
- Abandon WTW near Buttermere, Quarry Hill, Ennerdale and Cornhow. (Retain existing WTW near Thirlmere which will continue to supply the Keswick area)

2.2.3 Revised assessment

Construction

There are two additional European sites within 15km of the new pipeline route. These are identified and assessed in **Table 2.2**.

Table 2.2 European sites within 15km of pipeline route not previously assessed

Site	Interest Features	Assessment
Roman Wall Loughs SAC	Natural eutrophic lakes	This site is a collection of upland lakes approximately 3km from the proposed pipeline route, but is not linked by a potential impact pathway. The proposed scheme would have no significant effect on this site or its interest feature, assuming normal best practice during construction.
Drigg Coast SAC	Estuaries; Grey dunes; Mudflats and sandflats; Salicornia and other annuals; Atlantic Salt Meadows; Embryonic shifting dunes; White dunes; Coastal dune heathland; Humid dune slacks; Dunes with creeping willow; Slender green feather-moss	The site is approximately 15km from the pipeline, but located in a separate catchment, and so not linked by a potential impact pathway. The proposed scheme would have no significant effect on this site or its interest feature, assuming normal best practice.

In addition, five sites are now closer to the pipeline route than under the original proposals (see **Table 2.3**).

Table 2.3 Previously assessed European sites closer to the new pipeline route than under the original proposals

Site	Interest Features	Assessment
North Pennine Dales Meadows SAC	Mountain hay meadows; Purple moor-grass meadows	These meadow sites were previously at least 5km from the pipeline route; the new route will be within 1km of one SAC unit near Greenhaugh, east of Kielder. However, this unit is on the far side of the River North Tyne (which flows from Kielder) and the pipeline is sited in the road at this point. There is therefore no impact pathway, and the proposed scheme would have no significant effect on this site or its interest feature, assuming normal best practice.
North Pennine Moors SAC	Dry heaths; Western acidic oak woodland; Siliceous scree; Siliceous rocky slopes; Alkaline fens; Calcareous rocky slopes; Wet heaths; Marsh saxifrage; Blanket bog; Juniper on heaths and calcareous grassland; Grassland on heavy metal-rich soils; Siliceous alpine and boreal grasslands; Calcareous dry grassland and scrub; Petrifying springs with tufa	This site was previously at least 3km from the pipeline route; the new route will be within 1km of the SAC. However, the site is uphill of the pipeline route and there are no impact pathways, and so the proposed scheme would have no significant effect on this site or its interest features, assuming normal best practice during construction
South Solway Mosses SAC	Active raised bogs; Degraded raised bog	This site was previously at least 9km from the pipeline route; the new route will be within 6km. However, no additional effects would be anticipated and the scheme would have no significant effect on this site or its interest features, assuming normal best practice during construction.
Tyne and Allen Gravels SAC	Grassland on heavy metal-rich soils	This site was previously at least 13km from the pipeline route; the new route will be within 1km of SAC units at Warden (River South Tyne) and Haltwhistle. However, no additional effects would be anticipated and the scheme would have no significant effect on this site or its interest features, assuming normal best practice during construction.
North Pennine Moors Special Protection Area (SPA)	Curlew (B+); Dunlin (ssp. schinzii)(B+); Golden plover (B); Hen harrier (B); Merlin (B); Peregrine falcon (B-)	This site was previously at least 3km from the pipeline route; the new route will be within 1km of the SPA. However, it is very unlikely that construction will disturb the interest features of the SPA, and can be appropriately scheduled in any case if this were considered a potentially significant issue at the scheme level. The proposed scheme would have no significant effect on this site or its interest features, assuming normal best practice.

Key for SPA features:

B Breeding

B+ Added as a breeding species in the SPA review

B- Removed as a breeding species in the SPA review

The new pipeline route is not significantly closer to any other sites, or located such that additional effects might be expected (e.g. now upstream of a site when previously downstream). There are no downstream sites within the Tyne catchment that are likely to be affected by the revised route. However, it should be noted that the timescale for construction of the Kielder option is longer than Thirlmere, and so there would be a risk of indirect effects on the River Ehen SAC since the scheme would take longer to relieve the current abstraction pressure on this site. Therefore, although the scheme would not affect any European sites as a result of its implementation, selection of this scheme as the preferred option would not resolve the current abstraction issues as quickly.

Operation

The scheme will operate as originally proposed, and therefore the conclusions of the original HRA (no significant effects) are still valid.

Summary

The revised scheme will have no additional impacts (compared to the scheme assessed at the dWRMP stage) that are likely to significantly affect any European sites. **The conclusions of the previous assessment (no significant effects assuming normal best-practice) remain valid and the option is (at the strategic level) a viable alternative to the preferred option**. Project-level HRAs are likely to be required if it is constructed but it is clear that the potential impacts on European sites can be avoided or mitigated at the scheme-level using established and reliable methods.

2.3 Lowest Cost Option

2.3.1 Summary of original assessment

The Lowest Cost Option is a group of four options (WC04, WC05a, WC09 and WC19[7]) that would need to be delivered together to meet the predicted supply/demand deficit in the West Cumbria WRZ. This means that its acceptability (from an HRA perspective) is determined by its most damaging or risky component(s). The assessment of the component options (see Table 4.2 of the draft HRA document (AMEC 2013c) for a summary) demonstrated that whilst significant adverse effects as a result of these options were probably unlikely, some of the options had a few uncertainties (particularly with regard to their operation) that it would be difficult to resolve at the strategy-level without detailed scheme-specific studies; for example:

- WC04: Wastwater (negotiate part abstraction licence): although additional abstraction from Wastwater would be within existing licences it would be higher than recent actual so Wastwater levels would be lower on average[8].
- WC05a*:* Development of New Boreholes in West Cumbria Aquifer (10 Ml/d): some of the new boreholes are outside the surface water catchment of the Ehen but the West Cumbria aquifer system has not been modelled in detail and it is possible that additional groundwater abstraction could affect groundwater baseflow supplies to the River Ehen. The Environment Agency groundwater resource assessment indicates that 10Ml/d is likely to be available, and this is likely to be a conservative position, but this also presents an uncertainty that would be difficult to resolve at the strategy level.
- WC09 (and supporting pipeline option WC24c)*:* Development of Boreholes in North Cumbria Aquifer: the new boreholes would be over 5km from any groundwater dependent terrestrial ecosystems, but may potentially affect surface waters feeding the Solway Firth. The Environment Agency has stated that 4.5Ml/d is likely to be available, and this is very unlikely to affect any water-resource dependent European sites or features, but additional modelling may be required to establish this with some certainty, adopting a similar approach to that for the West Cumbria aquifer.
- WC19*:* Crummock Automated Compensation Control: operation of the scheme would be within the terms of the existing licence but abstraction would be higher than recent actual so River Cocker actual flows would tend to be lower on average than they have been recently (although this would still be acceptable in terms of the RoC for the planning period). **This component is no longer required and has been removed from the Lowest Cost option set, see footnote in Section 1.1.**

If all components of the Lowest Cost Option set achieve their design outputs, the predicted supply/demand deficit can be met. However, there remains uncertainty over the availability of sustainable groundwater supplies from the West Cumbria aquifer and also on the commitment of a supply from a third party from Wastwater. This would not in itself result in significant effects but would not improve the resilience of the system or reduce the risk of in

[7] Note, Option WC19 is no longer required for the Lower Cost option.

[8] Note: following consultation comments from Natural England the operation of this option and its likely effects on Wast Water SAC have been reviewed; it is apparent that the original assessment misinterpreted the operation of the scheme and the review has concluded that the option will have no significant effect on Wast Water SAC.

combination effects with, for example, United Utilities' (2013) Final Drought Plan. The option does not have any clear or inevitable significant effects, and therefore could be explored as a preferred option, but it is evidently a more marginal option than Kielder or Thirlmere, from a strategic HRA perspective.

2.3.2 Key changes to the Lowest Cost Option

The principal change to this option is the removal of WC19 (Crummock automated compensation control) and the associated pipeline transfer (WC24f). There are no other substantive changes to this option as currently proposed (although it is noted that United Utilities have been considering variations on WC05: Development of New Boreholes in West Cumbria Aquifer as alternative feasible options that could be used within the option set if, for example, certain components were not available (e.g. WC04). Further details of these feasible options are provided in **Appendix A** of this Addendum document.

2.3.3 Revised assessment

Construction

The conclusions of the draft HRA remain unchanged i.e. significant effects are possible in association with pipeline construction, but these can be avoided using standard best-practice and project-specific mitigation measures. It should be noted that the removal of the WC19 component will reduce the risk of effects on some European sites as the connecting pipeline would not be required.

Operation

The conclusions of the draft HRA remain unchanged, i.e. that the operational effects of the options providing new water supplies (notably the WC05 options) are uncertain because the data required to make an accurate assessment of the impacts on the River Ehen SAC are not available. These data would only be available following further detailed borehole investigations and aquifer modelling. For the WC05 options, some of the proposed boreholes are outside the surface water catchment of the Ehen and the Environment Agency has stated that 10 Ml/d is likely to be available. However, the groundwater components have the potential for significant effects on protected sites within the Ehen catchment and there is not sufficient understanding of the in-combination effects of the groundwater abstraction from the adjacent Ehen and Calder catchments to categorically state at this stage there would be no effect on the lower reaches of the River Ehen over time.

Summary

It would not be recommended to take forward the Lowest Cost Option as a preferred option due to the uncertainty with regard to the potential effects on the River Ehen SAC, which would only be answerable following a period of detailed groundwater investigations on the West Cumbria aquifer which would delay implementation of the scheme. In addition, the Thirlmere or Kielder options would need to be specifically set out as an alternative which would be pursued if the Lower Cost option was found to have significant effects. Further details on why the Lowest Cost option set is not considered viable are detailed in the WRMP document (section 10.2.1.)

3. In Combination Effects

3.1 Overview

HRA requires that the effects of other projects, plans or programmes be considered for effects on European sites 'in combination' with the WRMP. The draft HRA considered the potential effects of the WRMP preferred option (Option WCO1: Thirlmere Transfer into West Cumbria) operating 'in combination' with other plans and projects including local and regional planning documents; United Utilities draft Drought Plan; other strategic plans; and major projects, including the potential nuclear new-build at Sellafield (see Section 5.4 and Appendix F of the draft HRA). However, it was not possible to complete an assessment of the possible effects of the United Utilities WRMP operating 'in combination' with other water company WRMPs as these were all drafted on the same timescale and other water company options were not therefore available for review or assessment (with the exception of Scottish Water). The draft WRMPs (and existing final WRMP in the case of Scottish Water) and supporting assessments (where available) for the following water companies have now been reviewed to identify potential in combination effects with the preferred and alternative WRMP options:

- Dwr Cymru Welsh Water;
- Severn Trent Water;
- Yorkshire Water;
- Northumbrian Water[9];
- Scottish Water.

In addition, the revisions to the preferred option require that the conclusions of the draft HRA (regards other, non-WRMP plans) be reviewed and confirmed. This assessment is summarised below. Assuming that the preferred options are retained by these companies then the assessment below is valid for the HRA of the final WRMP.

3.2 Other Water Company WRMPs

3.2.1 Option WC01: Thirlmere Transfer into West Cumbria

Construction

The West Cumbria WRZ is a substantial distance from the other water company boundaries[10], and further still from the locations (and zone of influence) of their preferred options. There are no European sites that are likely to be

[9] Note: Northumbrian Water is predicting a surplus for the planning period so has not proposed any supply-side options in its dWRMP.

exposed and sensitive (i.e. vulnerable) to construction-related impacts from the preferred option and an option promoted by another water company, with the possible exception of the Solway Firth suite of sites (Solway Firth SAC; Upper Solway Flats and Marshes SPA; Upper Solway Flats and Marshes Ramsar) and the River Eden SAC, which are on the border between the Scottish Water supply area and the West Cumbria WRZ.

However, none of the construction work associated with the preferred option will be located within the catchments of these European sites (the most northerly construction works are within the River Ellen catchment), and the sites do not support mobile species that are likely to be affected by the works when using habitats outside the SAC boundaries. Therefore it is considered that the preferred option will have no effect on any European sites 'in combination' with any other water company options as a result of construction.

Operation

Thirlmere is not a 'shared resource' (other water companies do not abstract from it for supply) and there are no indirect operational linkages with other water companies. As a result no European sites will be exposed to potential effects associated with United Utilities' preferred option operating 'in combination' with the preferred options identified by the other water companies.

3.2.2 Option WC14d: Kielder Water Transfer to West Cumbria (Treated near Carlisle)

Construction

The route of the Kielder transfer would run partly within the Northumbria Water supply area, although as Northumbrian Water has included no supply-side schemes in its draft WRMP there cannot be any 'in combination' effects with this plan. The transfer main would cross the River Eden SAC and so effects on the Solway Firth suite of sites (Solway Firth SAC; Upper Solway Flats and Marshes SPA; Upper Solway Flats and Marshes Ramsar) and the River Eden SAC 'in combination' with the Scottish Water WRMP are conceivable, although the Scottish Water WRMP does not identify specific schemes within the catchments of the Eden and Solway Firth. However, it is considered that significant effects on the River Eden SAC (and hence the Solway suite of sites) can be avoided with best-practice and established mitigation and avoidance measures, and that 'in combination' effects would not occur. Any potential effects between options would be identified and assessed as part of a scheme-level HRA in any case. Therefore it is considered that Option WC14d will have no significant effect on any European sites 'in combination' with any other water company options as a result of construction.

[10] At least: 30km from the Northumbrian Water boundary; 50km from the Yorkshire Water boundary; and 140km from the Severn Trent Water and Welsh Water boundaries. Only the northern edge of the West Cumbria WRZ borders another water company area (Scottish Water).

Operation

Kielder Water is operated by Northumbrian Water and therefore would become a 'shared resource' under this option. Northumbrian Water is in surplus for the planning period and has not included any supply-side options within its dWRMP; it has indicated to United Utilities that the 80Ml/d required for this option would be available from Kielder. United Utilities is not aware that any other water companies have included abstraction from Kielder within their draft WRMPs. There are no water-resource sensitive European sites which are downstream or otherwise dependent on Kielder, and therefore 'in combination' operational effects would not be expected. However, this would need to be reviewed should Option WC14d be taken forward, since it would require revisions to both United Utilities' and Northumbrian Water's WRMPs.

3.2.3 Lowest Cost Option

Construction

Construction works associated with the Lowest Cost Option would be entirely within the West Cumbria WRZ, and would not affect any European sites (or associated mobile species) which could be affected by other water company options. There will be no 'in combination' effects as a result of construction.

Operation

The Lowest Cost Option utilises water resources that are entirely within the West Cumbria WRZ, which are not linked to any water-resource sensitive European sites which could be affected by other water company options. There will be no operational 'in combination' effects.

3.2.4 Summary

The preferred option (WC01: Thirlmere Transfer into West Cumbria) will have no significant effects 'in combination' with other water company WRMPs. The alternative options (Option WC14d and the Lowest Cost Option Kielder) will also have no 'in combination' effects (Lowest Cost Option) or 'no likely significant effects' (Option WC14d) with other water company plans, although the potential effects of these alternatives would need to be reviewed if taken forward.

3.3 Other Plans and Programmes

The draft HRA considered the potential effects of the WRMP preferred option (Option WC01) operating 'in combination' with other plans and projects including local and regional planning documents; the United Utilities Drought Plan; other strategic plans; and major projects, including the potential nuclear new-build at Sellafield (see Section 5.4 and Appendix F of the draft HRA). This assessment has been reviewed following the more detailed engineering scope changes and it is considered that the alterations to the option do not alter the conclusions of the draft HRA – i.e. **the preferred option will have no significant effect 'in combination' with any known plans, programmes or projects** (as far as can be determined at the strategy-level, taking into account the timescales over

which the preferred option would be implemented). The same conclusion is reached for the alternative options (Option WC14d and the Lowest Cost Option).

4. Summary and Conclusions

4.1 Summary

4.1.1 Preferred Option: WC01 - Thirlmere Transfer into West Cumbria

Following submission of the dWRMP in March 2013, United Utilities has carried out further investigations and feasibility studies for its preferred option (WC01 - Thirlmere Transfer into West Cumbria) to allow for more robust costing of the proposal. These studies have resulted in changes to the option set out in the dWRMP and hence assessed by the draft HRA.

In summary, the key difference between the option assessed at the dWRMP stage and the more detailed engineering scope is that the route of the transfer main from Thirlmere to the Cockermouth area now passes east of Bassenthwaite Lake, rather than west. This alters the point at which the pipeline must cross the River Derwent and Bassenthwaite Lake SAC. There are other minor changes in infrastructure requirements and pipeline routes but these do not significantly alter the likely impacts of the scheme. There would be no fundamental change to the operation of the scheme.

The proposed alterations to the preferred option (which would be the scheme that is included in United Utilities' Final WRMP) have been reviewed to ensure that the conclusions of the draft HRA of the dWRMP remain valid. This re-assessment identified:

- one European site that was not previously assessed by the draft HRA (Drigg Coast SAC, now just within 15km, the result of minor pipeline route refinement near Cleator Moor);
- one site that is closer to the pipeline route (Ullswater Oakwoods SAC; previously 10km away, now 7km);
- one site that is affected at a different location (River Derwent and Bassenthwaite Lake SAC; previously crossed between Derwent Water and Bassenthwaite Lake, now crossed near the mouth of Bassenthwaite Lake).

Potential 'in combination' effects with other water company WRMPs have also been assessed and the 'in combination' effects with other plans and programmes identified at the draft HRA stage were reviewed.

The re-assessment has concluded that the revised scheme will have no additional effects compared to the original scheme assessed. **The conclusions of the draft HRA remain valid** and Option WC01 is considered to be viable as a preferred option which will have no adverse effects on any European sites as a result of its implementation (although project-specific HRAs will be required if it is constructed). The only residual uncertainty surrounding the operation of the option is associated with the potential effects of the reduction in the highest flows on the condition of the spawning habitats in the River Derwent and Bassenthwaite Lake SAC – specifically, whether the reduction will affect the flushing of sediments from spawning gravels. However, sedimentation is not considered a significant issue within St. John's Beck (due in part to the presence of the reservoir) and no issues with

sedimentation due to flow control were identified historically or as part of the RoC process: the only flow issue identified as having an adverse effect by the RoC was the reduction in flow variability in St. John's Beck, specifically the availability of spate flows for migrating fish (which will not be affected by this option).

4.1.2 Alternatives

Changes to the alternatives identified by United Utilities in their dWRMP (Options WC14d: Kielder Water Transfer to West Cumbria (Treated near Carlisle) and the Lowest Cost Option) have also been reviewed to ensure that the conclusions of the draft HRA remain valid. In summary:

- The more detailed engineering scope for WC14d has identified an appropriate pipeline route which avoids all European sites other than those riverine sites which need to be crossed by the transfer main (this addresses a specific uncertainty that existed at the draft stage regarding possible impacts on the Border Mires SAC). As a result, it is certain that the scheme can be delivered without significant adverse effects on any European sites, assuming project-level HRA is undertaken to identify scheme-specific mitigation measures (in addition to those set out in Appendix G of the draft HRA) which may be required to avoid impacts on the riverine SACs crossed by the pipe. The option will have no operational impacts.

- There are no significant alterations to the Lowest Cost Option (other than the removal of the Crummock automated compensation control component) and therefore the conclusions of the draft HRA remain valid.

4.2 Conclusions

Assuming that:

- Option WC01: Thirlmere Transfer into West Cumbria (as assessed) remains the preferred option in the final WRMP; and

- the best-practice and bespoke mitigation and avoidance measures set out in Appendix G of the draft HRA are referred to by the WRMP; and

- project-level HRA is completed by United Utilities for this option; and

- United Utilities commits to Option WC14d: Kielder Water Transfer to West Cumbria (Treated near Carlisle) (or an appropriate review of the WRMP and available alternatives) should Option WC01 be shown to have unavoidable and unmitigatable adverse effects at the scheme level;

then **the WRMP will have no significant adverse effects on any European sites, either alone or 'in combination' with other known projects, plans or programmes as a result of its implementation.**

It should be noted that the WRMP is inherently flexible due to the formal five-yearly review process, which provides a clear mechanism for monitoring performance and an opportunity to adjust the proposals to reflect any changing circumstances. The preferred option will, of course, be subject to project-level environmental assessment as part of the normal Environmental Impact Assessment (EIA), planning and/or Environment Agency consenting

processes, which will necessarily include assessments of their potential to affect European sites during their construction or operation. These measures can therefore be further relied on to ensure that adverse effects do not occur as a result of the implementation of the WRMP.

5. References

AMEC (2013a). *Environmental and Social Costs of Water Resources Management Plan Options.* Report by AMEC E&I UK Ltd. for United Utilities. AMEC ref. B32935rr150i7

AMEC (2013b). *Strategic Environmental Assessment of Draft Water Resources Management Plan: Environmental Report Addendum.* Report by AMEC E&I UK Ltd. for United Utilities. AMEC ref. B32935rr155i4

AMEC (2013c). *Habitats regulations assessment of the Water Resources Management Plan: Assessment of Feasible and Preferred Options.* Report by AMEC E&I UK Ltd. for United Utilities. AMEC ref. S32935rr140i5

Appendix A
Assessment of Additional Feasible Options

Overview

Since the dWRMP was submitted in March 2013, United Utilities has identified additional feasible options for the West Cumbria WRZ that could be used to meet the deficit, either on their own or conjunctively with other options. These new feasible options have been reviewed using the same methods employed in the draft HRA, to establish whether any are likely to have significant effects on any European sites. This is to ensure that the assessment is as thorough and complete as possible, although these options are not being considered as preferred options (or components of preferred options for the final WRMP and therefore detailed HRA is not essential to determine the compliance of the final WRMP).

Option WC05: Development of New Boreholes in West Cumbria Aquifer - variations

Draft WRMP options

Two variations of WC05 were included within the dWRMP and assessed within the draft HRA: WC05 and WC05a. These options would make use of water that is estimated to be available within the West Cumbria aquifer.

- Option WC05 would involve the construction of three new boreholes and utilise an existing borehole to deliver 6Ml/d.
- Option WC05a would involve the construction of seven new boreholes and utilise an existing borehole to deliver 10Ml/d.

Both options would require a new borehole at each site, with new fixed speed borehole pump and headworks kiosk. The existing site would also require a new break tank, aeration tower and RWPS. Pipelines would connect each borehole site and a common pipeline would be required to transfer all raw water to the WTW serving Ennerdale. A new washout main would also be needed from the existing borehole site to the nearest Egremont sewer.

The European sites likely to be affected by WC05/WC05a are noted in Appendix E of the HRA, and summarised in **Table A.1** below. The site most vulnerable to the effects of the WC05/WC05a is the River Ehen SAC, the boundary of which is approximately 4km from the nearest borehole. Data from pump tests of existing borehole abstractions near Egremont indicate that the aquifer may exhibit a confined response (which could limit the risk of direct effects on the Ehen SAC). However, the existing borehole is less than 500m from the lower (non-SAC) reaches of the Ehen, which will be used by the mobile interest features of the site (Atlantic salmon and (in

association) pearl mussel[11]) and which could be affected by the scheme. On the other hand, it should be noted that the other borehole locations are outside the surface water catchment of the Ehen, and two are separated by another surface water feature (Pow Beck) so greatly reducing the likelihood of groundwater abstractions from these locations affecting the Ehen.

[11] Atlantic salmon may be directly affected by changes to the hydrology of the lower reaches of the Ehen; pearl mussel are likely to be consequently vulnerable as the species is dependent on salmon for part of its life-cycle.

Table A1 Summary of potential effects of WC05 / WC05a *(see also Appendix E of the draft HRA)*

Site and interest features	~ dist.	Summary of likely effects
Borrowdale Woodland Complex SAC (Siliceous rocky slopes; Western acidic oak woodland; Bog woodland*)	7km	No impact pathways
Drigg Coast SAC (Estuaries; Grey dunes*; Mudflats and sandflats; Salicornia and other annuals; Atlantic Salt Meadows; Embryonic shifting dunes; White dunes; Coastal dune heathland*; Humid dune slacks; Dunes with creeping willow)	10km	No impact pathways – water resource sensitive features located within separate surface water / groundwater catchment.
Lake District High Fells SAC (Slender green feather-moss; Calcareous rocky slopes; Oligotrophic to mesotrophic standing waters; Alkaline fens; Siliceous scree; Wet heaths; Siliceous rocky slopes; Dry heaths; Alpine and Boreal heaths; Juniper on heaths and calcareous grasslands; Siliceous alpine and boreal grasslands; Blanket bog*; Species-rich Nardus grassland*; Western acidic oak woodland; Hydrophilous tall herb communities)	<1km	Site is within 1km of potential construction location, but is upslope and only likely to be vulnerable to direct impacts (there are no mobile species). Any potential effects are avoidable with normal best-practice measures. No operational effects will occur due to the distance from the boreholes (>9km).
North Pennine Dales Meadows SAC (Mountain hay meadows; Purple moor-grass meadows)	11km	No impact pathways – water resource sensitive features located within separate surface water / groundwater catchment.
River Derwent and Bassenthwaite Lake SAC (River Lamprey; Brook lamprey; Sea lamprey; Oligotrophic to mesotrophic standing waters; Atlantic salmon; Marsh fritillary butterfly; Floating water-plantain; Otter; Water courses with Ranunculus-type vegetation)	5km	No impact pathways – water resource sensitive features located within separate surface water / groundwater catchment.
River Ehen SAC (Freshwater pearl mussel; Atlantic salmon)	0km	The pipeline associated with this scheme will need to cross the SAC river twice but this is likely to be via existing road crossings and it is certain that significant adverse effects could be avoided with established best-practice measures and project-specific mitigation. Two of the proposed boreholes are outside Ehen surface water catchment and likely be isolated from the SAC. However, the existing boreholes are likely to be within 500m of the lower reaches of the Ehen and whilst the river is not a SAC at this location (the closest point of the SAC over 3km upstream and data from pump tests of existing borehole abstractions near Egremont indicate that the aquifer exhibits a confined response) it is possible that the borehole could affect the lower reaches of the river and hence the mobile species (notably Atlantic salmon). However, the effects cannot be accurately characterised without additional investigations and modelling.
Wast Water SAC (Oligotrophic to mesotrophic standing waters)	12km	No impact pathways – water resource sensitive features located within separate surface water / groundwater catchment.

* Priority features

United Utilities has scoped additional variations on the WC05 option (WC05b, WC05c and WC05d); the potential effects of these options are summarised in the following sections. The European sites likely to be affected by the variations are the same as for WC05/WC05a (see **Table A1**)

Option WC05b: Development of New Boreholes in West Cumbria Aquifer (20Ml/d)

Option WC05b is a similar design to WC05a, except that:

- the design capacity of the scheme is 20Ml/d rather than 10Ml/d; and
- fifteen new boreholes would be required in addition to utilising an existing borehole (i.e. 16 boreholes required in total).

The effects of this option are likely to be the same as those summarised in **Table A1**, although there is a greater risk of significant effects on the River Ehen SAC (or at least the lower reaches of the river and hence the mobile interest features of the SAC) if the combined effect of the additional abstractions depletes river baseflow at certain times. This risk cannot be quantified without additional investigations which would be a pre-requisite of any abstraction licence application. However, from a strategic-HRA perspective it would be appropriate to identify suitable 'no significant effect' alternatives to this option (if it is considered as part of the preferred option) which United Utilities would be committed to pursuing if WC05b is shown to have adverse effects at the project stage.

Option WC05c: Development of New Boreholes in West Cumbria Aquifer (20Ml/d)

Option WC05c would also have a design capacity of 20Ml/d, although this would comprise:

- seven new boreholes in addition to utilising an existing borehole to supply 10Ml/d (as per the scope of WC05a); and
- four additional boreholes in the Calder Sandstone (these would be located south in the River Calder catchment) but also located within the same West Cumbria aquifer system as the eight boreholes to the north.

The effects of this scheme are likely to be as for WC05a. The lower reaches of the River Ehen may be vulnerable to abstraction from the St Bees borehole group, in particular the close river proximity to the existing boreholes, which may affect mobile species. However, the four additional boreholes in the Calder Sandstone are located in the River Calder catchment and are unlikely to be linked hydrologically to the River Ehen catchment. However, both sets of boreholes abstract from the same groundwater system (the West Cumbria aquifer) and there is not sufficient understanding of the in-combination effects of the groundwater abstraction from the adjacent Ehen and Calder catchments to categorically state at this stage there would be no effect on the lower reaches of the River Ehen over time. Other effects, not related to the Habitats Regulation Assessment, could include the derogation of flows within the Calder catchment or the impact on other abstractors. The additional Calder boreholes are closer to the Drigg Coast SAC (approx. 5km at the closest point) but again, they are within separate surface water catchments from those associated with this SAC and so unlikely to affect any water-resource sensitive features. Additional pipelines will be required but the effects of these can be managed with normal best-practice and (if necessary) established project-specific measures.

From a strategic-HRA perspective it would be appropriate to identify suitable 'no significant effect' alternatives to this option (if it is considered as part of the preferred option), which United Utilities would be committed to pursuing if WC05c is shown to have adverse effects at the project stage.

Option WC05d: Development of New Boreholes in West Cumbria Aquifer (5.4 Ml/d)

Option WC05d has a design capacity of 5.4 Ml/d and would require:

- seven new boreholes in addition to utilising an existing borehole to supply 5.4Ml/d (as per WC05a, except with less output and hence infrastructure and pumps would be sized accordingly);
- an increased output from the boreholes developed at South Egremont during AMP5 (these boreholes and associated infrastructure were designed to yield 6.4Ml/d, but have been proven to be capable of 11Ml/d; therefore, a further 4.6Ml/d will be gained by upgrading the capacity of this infrastructure as it is delivered during AMP5).

The potential effects of this scheme are likely to be similar to or less than WC05a. The lower reaches of the River Ehen may be vulnerable to abstraction from the St Bees borehole group, in particular the close river proximity to the existing boreholes, which may affect mobile species. However, the level of abstraction from this area is less (maximum 5.4Ml/d versus 10Ml/d) and so this option is less likely to affect the river. The South Egremont boreholes have been constructed and are due to be licensed in 2014, and are not considered to have any significant effects on any European sites (there are no effects on river baseflows). Although this licence would require variation to allow the additional 4.6 Ml/d it is not expected that this would have any effect on any European sites. Additional pipelines will be required but the effects of these can be managed with normal best-practice and (if necessary) established project-specific measures.

From a strategic-HRA perspective it would be appropriate to identify suitable 'no significant effect' alternatives to this option (if it is considered as part of the preferred option), which United Utilities would be committed to pursuing if WC05d is shown to have adverse effects at the project stage.

Option WC25: Effluent Re-use

Option WC25 is a new feasible option that United Utilities has investigated following discussions with the Environment Agency. This option would be a 20 Ml/d transfer of treated final effluent from WwTWs at Whitehaven and Workington to Ennerdale for distribution. The option would require two new WTW facilities at each WwTW site and then pipelines to connect Workington to Whitehaven and then Whitehaven to a service reservoir serving Ennerdale.

The requirements would be as follows:

- Provision of metering and screening, 10Ml/d capacity service reservoir and pumping station at Workington WwTW;
- A new 12.2km long pipeline connecting Workington to tanks on new site at Whitehaven;
- Provision of metering and screening and pumping station at Whitehaven WwTW to transfer effluent to new site at Whitehaven;

- Collection in below ground tanks at a new site at Whitehaven where mixing with treated effluent from Whitehaven would take place;
- Construction of new buildings and treatment processes on the above new site at Whitehaven. Treatment processes to include Membrane Bio Reactor (MBR), reverse osmosis, UV, chemical dosing. Other facilities to include MCC kiosk, administration building, lime silos, process building, contact tank, water backwash tank, transfer pumping station; and
- Transfer to a service reservoir serving Ennerdale using new 17km dedicated transfer pipeline.

Summary of assessment

A summary of the potential effects of Option WC 25 is provided in **Table A.2**. Construction of Option WC25 would require that the River Derwent and Bassenthwaite Lake SAC and the River Ehen SAC be crossed by new pipelines, although any potential effects can almost certainly be avoided or mitigated by appropriate timing of the works and normal best-practice measures. There is nothing in the scale or type of effects that would suggest that the option would have significant or adverse effects on any European sites that cannot be avoided at the scheme-level.

During operation, the option would utilise effluent that would otherwise be discharged to sea via a long sea-outfall (LSO), reducing/altering these discharges. There are no European sites close to the LSOs and no effects on mobile species (notably, the anadramous fish) would be reasonably expected as a result of operation. No other operational effects would be expected.

Table A2 Summary of potential effects of Option WC25

Site and interest features	~ dist.	Summary of likely effects
Borrowdale Woodland Complex SAC (Siliceous rocky slopes; Western acidic oak woodland; Bog woodland*)	7km	No impact pathways
Drigg Coast SAC (Estuaries; Grey dunes*; Mudflats and sandflats; Salicornia and other annuals; Atlantic Salt Meadows; Embryonic shifting dunes; White dunes; Coastal dune heathland*; Humid dune slacks; Dunes with creeping willow)	13km	No impact pathways – water resource sensitive features located within separate surface water / groundwater catchment.
Lake District High Fells SAC (Slender green feather-moss; Calcareous rocky slopes; Oligotrophic to mesotrophic standing waters; Alkaline fens; Siliceous scree; Wet heaths; Siliceous rocky slopes; Dry heaths; Alpine and Boreal heaths; Juniper on heaths and calcareous grasslands; Siliceous alpine and boreal grasslands; Blanket bog*; Species-rich Nardus grassland*; Western acidic oak woodland; Hydrophilous tall herb communities)	<1km	Site is within 1km of potential construction location, but is upslope and only likely to be vulnerable to direct impacts (there are no mobile species). Any potential effects are avoidable with normal best-practice measures.
North Pennine Dales Meadows SAC (Mountain hay meadows; Purple moor-grass meadows)	12km	No impact pathways – water resource sensitive features located within separate surface water / groundwater catchment.
River Derwent and Bassenthwaite Lake SAC (River Lamprey; Brook lamprey; Sea lamprey; Oligotrophic to mesotrophic standing waters; Atlantic salmon; Marsh fritillary butterfly; Floating water-plantain; Otter; Water courses with Ranunculus-type vegetation)	0km	The pipeline associated with this scheme will need to cross the SAC river but this is likely to be via an existing road crossing and it is certain that significant adverse effects could be avoided with established best-practice measures and project-specific mitigation. Some features not exposed (e.g. floating water-plantain, associated with Bassenthwaite Lake)
River Ehen SAC (Freshwater pearl mussel; Atlantic salmon)	0km	The pipeline associated with this scheme will need to cross the SAC river but this is likely to be via an existing road crossing and it is certain that significant adverse effects could be avoided with established best-practice measures and project-specific mitigation.
Solway Firth SAC (Salicornia and other annuals, Estuaries, Sandbanks, Mudflats and sandflats, Atlantic Salt Meadows, Sea lamprey, Reefs, Grey dunes*, Perennial vegetation of stony banks, River Lamprey)	15km	Separate catchment; features not exposed to likely effects of scheme.
Wast Water SAC (Oligotrophic to mesotrophic standing waters)	12km	No impact pathways – water resource sensitive features located within separate surface water / groundwater catchment.
Upper Solway Flats and Marshes SPA (Barnacle goose (W+), Bar-tailed godwit (W), Curlew (W), Dunlin (ssp. alpina)(W), Golden plover (W), Goldeneye (W-), Grey plover (W-), Knot (W), Oystercatcher (W), Pink-footed goose (W), Pintail (W), Redshank (W), Ringed plover (P+), Sanderling (W-), Scaup (W-), Shelduck (W-), Shoveler (W-), Teal (W-), Turnstone (W-), Waterfowl assemblage (W), Whooper swan (W))	15km	Separate catchment; features not exposed to likely effects of scheme.
Upper Solway Flats and Marshes Ramsar Natterjack toad; Waterfowl Assemblage; Bird species	15km	Separate catchment; features not exposed to likely effects of scheme.

*	Priority species	W-	Removed as a wintering species in the SPA review
W	Wintering	W+	Added as a wintering species in the SPA review

Appendix B
Summary Tables

Table B2 below provides a summary of:

- the revised assessments of the preferred and alternative options (i.e. WC01 Thirlmere Transfer into West Cumbria; WC14d Kielder Water Transfer to West Cumbria (Treated near Carlisle); and the Lowest Cost option); and
- the assessments of the new feasible options identified by UU and not assessed in the draft HRA (WC05b, WC05c, WC05d and WC25).

The table follows the format of the feasible options assessment summary table in the draft HRA report (Table 4.2). The colour coding and categories are as per Table 3.1 in the draft HRA, which is reproduced below for information.

Table B1 Summary of significance assessment criteria for feasible options

LSE?*	Summary
No (N)	The option will not, as far as can be reasonably determined, have any significant effects on the European site due to either: • the site or interest features not being **sensitive** to the likely outcomes of the WRMP (e.g. sites without water resource dependent[12] interest features or mobile species); and/or • the site or interest features not being **exposed** to the likely outcomes of the WRMP due to the absence of impact pathways. This will include options where there is no reason to assume that works could not be accommodated without significant effects assuming that standard construction best-practice or mitigation that is common, established and known to be successful in similar situations, is applied. Feasible options in this category are recommended for consideration as preferred options, subject to future review as part of the iterative HRA process.
Uncertain (U)	Options where a potential effect is conceivable and cannot be discounted, and the likely effects are therefore uncertain (at the feasible options stage). This is typically due to limitations on the information available, either in terms of the operation of the scheme, or the data available on the interest features of the sites. These options, if pursued as preferred options, may require some additional investigation to determine the likelihood of significant effects, and it is possible that the risk of effects cannot be quantified sufficiently at the strategic level to show no LSE (for example, substantial additional modelling or site-specific investigation may be required). Adverse effects are not necessarily likely (should appropriate assessment be undertaken) but generic mitigation measures may not be sufficient to ensure no LSE. Feasible options in this category may be recommended for consideration as preferred options, subject to future review as part of the iterative HRA process, but may require some additional information to support their inclusion in the WRMP potentially including a more formal 'appropriate assessment' stage if effects cannot be clearly demonstrated to be negligible with additional information.
Yes (Y)	Significant effects (i.e. not negligible or inconsequential) on a European site are very likely or certain due to the scale/ nature/location of the Option proposals, or the sensitivity and distribution of the interest features within /near the European site. Although a full appropriate assessment is not undertaken at this stage, adverse effects may be more likely (or even certain) if the scheme is taken forward as a preferred option and it is likely that extensive and uncertain mitigation will be required following scheme-level investigations. Feasible options in this category are **not** recommended for consideration as preferred options (although additional information may allow a re-assessment) as there appears, at the strategic level, to be a substantial risk of significant and potentially adverse effects, and the option would probably have to rely substantially on detailed 'down-the-line' assessment, which is unlikely to be appropriate for inclusion in the WRMP.

*LSE – Likely Significant Effects

[12] Based on data within the National EA guidance *Habitats Directive Stage 2 Review: Water Resources Authorisations – Practical Advice for Agency Water Resources Staff.*

Table B2 Summary of assessment of additional feasible options (note Pref. Opt. is 'preferred option'; see Table A4 below for summary of assessment criteria and colour coding)

Feasible Option		Summary assessment	Consider as Pref. Opt?
WC01	Thirlmere Transfer into West Cumbria	This scheme would require substantial lengths of new pipeline and several other new assets. As proposed, the pipelines would be mostly within existing roads, other than some short linking sections and it would generally be expected that effects could be avoided with normal best practice and some scheme-specific mitigation (although suitable measures would be defined through project-level HRA). However, pipeline sections would cross / run adjacent to the River Ehen SAC and the River Derwent and Bassenthwaite Lake SAC. Other pipeline sections would be in close proximity to other SACs (for example: Lake District High Fells SAC, Clint's Quarry SAC, North Pennine Dales Meadows SAC). Significant construction effects on the River Derwent and Bassenthwaite Lake SAC are possible due to the proximity of the works although it is likely that these can be managed / avoided with standard mitigation measures. For other sites it is likely that significant adverse construction impacts could be avoided, although specific measures (e.g. timing of the works to avoid migration periods) will be required. With regard to operation, the scheme is designed to relieve pressure on the River Ehen SAC and therefore adverse effects on this site would not be expected. The current abstraction levels and compensation releases to the River Derwent would be maintained. The RoC Site Action Plan for the River Derwent and Bassenthwaite Lake SAC (2009) noted that the "*expert opinion* [of the Environment Agency's Project Group] *was that this spate release was adequate for salmonid migration*". Arrangements are currently in place for the periodic release of up to 100Ml/d from Thirlmere under the Environment Agency RSA programme, which has been factored into the calculations for the option, and therefore it is certain that that the option will not affect the provision of these spate flows. The only residual uncertainty surrounding the option is associated with the potential effects of the reduction in the highest flows on the condition of the spawning habitats in the river – specifically, whether an anticipated reduction in the frequency and size of the very highest flows (Q5) will affect the flushing of sediments from spawning gravels. However, sedimentation is not considered a significant issue within St. John's Beck (due in part to the presence of the reservoir) and no particular issues with sedimentation due to flow control have been identified historically or as part of the RoC process. Indeed, gravel supply to the beck (rather than sedimentation of existing gravels) was identified as a reason for the unfavourable condition through the RoC, and measures were proposed to resolve this including seeding of gravels to Helvellyn Gill. Spate flows to Helvellyn Gill would not be affected by this option (the presence and condition of the gravels in this beck is partly controlled by seeding and compensation release) and it is unlikely that the reduction in the very highest flows will have any measurable effect on the condition of the spawning gravels within the SAC. Overall, the proposed changes to the abstraction regime are unlikely to significantly reduce the value of St John's Beck to salmon, or affect the favourable conservation status of this feature.	Yes - although some option-specific mitigation may need to be identified (e.g. seasonal working)

Feasible Option		Summary assessment	Consider as Pref. Opt?
WC04	Wastwater (negotiate part abstraction licence)	Additional abstraction from Wastwater would be within existing licences but it would be higher than recent actual so Wastwater actual levels would tend to be lower on average than they have been previously. This would affect the River Ehen SAC, although it is uncertain whether these changes would have significant effects. The construction of the scheme could potentially affect the River Ehen SAC as it is likely that this will be crossed by the transfer pipeline, but potential effects of this could be avoided / mitigated by using existing road crossings and by (for example) appropriate timing of works / mitigation. Appropriate assessment will be required at the scheme level but the effects are not clearly unavoidable or adverse.	Maybe - significant effects possible / likely but these will not inevitably be adverse and will probably be mitigatable at the strategy / scheme level
WC05	Development of New boreholes in West Cumbria Aquifer	The construction of the scheme could potentially affect the River Ehen SAC as it is likely that this will be crossed by the transfer pipeline, but potential effects of this could be avoided / mitigated by using existing road crossings and by (for example) appropriate timing of works / mitigation. Appropriate assessment will be required at the scheme level but the effects are not clearly unavoidable or adverse. Operation of the scheme is more difficult to characterise; the new boreholes are outside the surface water catchment of the Ehen and therefore any localised drawdown would not affect tributaries of the river. It is possible that the new boreholes may affect groundwater supplies to the Ehen, although it is not clear what contribution to flow these are likely to make; in fact, any effects are likely to be felt outside of the SAC, but may affect mobile species (Atlantic salmon) migrating through the lower reaches. It may be necessary to characterise this to support the option.	Maybe - significant effects possible / likely but these will not inevitably be adverse and will probably be mitigatable at the strategy / scheme level
WC05a	Development of New boreholes in West Cumbria Aquifer (10 Ml/d)	This option would be the same as WC05, except with a 10Ml/d capacity rather than 5Ml/d. The effects are the same, although operational effects may be more likely.	Maybe - significant effects possible / likely but these will not inevitably be adverse and will probably be mitigatable at the strategy / scheme level
WC05b	Development of New Boreholes in West Cumbria Aquifer (20 Ml/d)	This option would be the same as WC05a, except with a 20Ml/d capacity rather than 5Ml/d. The effects are the same, although operational effects are more likely to be significant. The option should not be relied on without additional data on water available for use.	Avoid if possible - significant effects identifiable which may be difficult to avoid / mitigate at the strategy level

Feasible Option		Summary assessment	Consider as Pref. Opt?
WC05c	Development of New Boreholes in West Cumbria Aquifer (20Ml/d)	The effects of this scheme are likely to be as for WC05a. The lower reaches of the River Ehen may be vulnerable to abstraction from the St Bees borehole group, in particular the close river proximity of the existing boreholes, which may affect mobile species. However, the four additional boreholes in the Calder Sandstone are located in the River Calder catchment and are almost certainly not linked hydrologically to the River Ehen. However, both sets of boreholes abstract from the same groundwater system (the West Cumbria aquifer) and there is not sufficient understanding of the in-combination effects of the groundwater abstraction from the adjacent Ehen and Calder catchments to categorically state at this stage there would be no effect on the lower reaches of the River Ehen over time. Other effects, not related to the Habitats Regulation Assessment, could include the derogation of flows within the Calder catchment or the impact on other abstractors. The additional boreholes are closer to the Drigg Coast SAC (approx. 5km at the closest point) but again, they are within separate surface water catchments from those associated with this SAC and so unlikely to affect any water-resource sensitive features. Additional pipelines will be required but the effects of these can be managed with normal best-practice and (if necessary) established project-specific measures.	Maybe - significant effects possible / likely but these will not inevitably be adverse and will probably be mitigatable at the strategy / scheme level
WC05d	Development of New Boreholes in West Cumbria Aquifer (5.4 Ml/d)	The potential effects of this scheme are likely to be similar to or less than WC05a. The lower reaches of the River Ehen may be vulnerable to abstraction from the St Bees borehole group, in particular the close river proximity existing boreholes, which may affect mobile species. However, the level of abstraction from this area is less (maximum 5.4Ml/d versus 10Ml/d) and so this option is less likely to affect the river. The South Egremont boreholes have been constructed and are due to be licensed in 2014, and are not considered to have any significant effects on any European sites (there are no effects on river baseflows). Additional pipelines will be required but the effects of these can be managed with normal best-practice and (if necessary) established project-specific measures.	Maybe - significant effects possible / likely but these will not inevitably be adverse and will probably be mitigatable at the strategy / scheme level
WC09	Development of Boreholes in North Cumbria Aquifer	The construction of the scheme would have no effects assuming normal best-practice. New borehole abstractions near Waverly and Thursby have the potential to impact on the nearby River Waverly and River Wampool, which discharges into the Solway Firth. The Waverton site is located approximately 12km upstream of Solway Firth, whilst Thursby is around 17 km upstream of the same site (SAC, SPA and Ramsar Site). It has been assumed a 1.5km reach downstream of the abstraction could be impacted, however, and therefore significant effects on this site would not be expected; the EA have indicated that some water is available for use from the North Cumbria aquifer (up to approx. 4.5 Ml/d). All other sites are almost certainly too distant for the abstraction to have a significant direct effect, including the River Eden SAC and the South Solway Mosses SAC which are both over 5km from the nearest borehole.	Maybe - significant effects unlikely but additional information on option required to confirm acceptability

Feasible Option		Summary assessment	Consider as Pref. Opt?
WC14d	Kielder Water Transfer to West Cumbria (Treated near Carlisle)	For Option WC14 d the main impacts are likely to be associated with construction. Additional studies following submission of the draft WRMP have allowed for a suitable pipeline route between Kielder and Carlisle to be identified, so that there is no risk of the Border Mires SAC being affected. The key change to this option as a result of the latest engineering scope is that the pipeline route from Kielder to Carlisle has been routed via existing roads, specifically via minor roads from the eastern end of the reservoir and then along the main road to Carlisle. Operational effects will be limited and not significant; the use of water from Kielder will not affect any WRD interest features at sites within its catchment and the only real mechanism for impacts would be indirect, through increases in discharges in the United Utilities WRZs after usage (in theory, 80Ml/d could be entering the West Cumbria WRZ). In reality, however, it is assumed that the transfer will be tailored to the deficit (there is no point in transferring 80Ml/d if it is not all required) and any increase in (for example) river flows will be well within natural variation. Although an interbasin transfer of raw water, it will be treated immediately on arrival and risks associated with this (e.g. invasive species transfer, significant variations in water chemistry) would not be expected. On this basis, the scheme would not have any significant and unavoidable effects.	Yes - although some option-specific mitigation may need to be identified (e.g. seasonal working)
WC25	Effluent Re-use	Construction of Option WC25 would require that the River Derwent and Bassenthwaite Lake SAC and the River Ehen SAC be crossed by new pipelines, although any potential effects can almost certainly be avoided or mitigated by appropriate timing of the works and normal best-practice measures. There is nothing in the scale or type of effects that would suggest that the option would have significant or adverse effects on any European sites that cannot be avoided at the scheme-level. During operation, the option would utilise effluent that would otherwise be discharged to sea via a long sea-outfall (LSO), reducing / altering these discharges. There are no European sites close to the LSOs and no effects on mobile species (notably, the anadramous fish) would be reasonably expected as a result of operation. No other operational effects would be expected.	Yes - although some option-specific mitigation may need to be identified (e.g. seasonal working)

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Appendix C
Summary of Statutory Consultee Comments and Responses

Natural England

Comment

A further general point to note here concerns the approach taken in the HRA of iteratively assessing the feasible and preferred options. The difficulty we have is that of the three options that emerged from the feasible options, only one was taken through to the most detailed level of assessment: the Thirlmere Transfer scheme, which is United Utilities preferred option. The choice of Thirlmere as a preferred option was guided by a whole range of factors, but not explicitly by the HRA. The dWRMP, however, is consulting on the three options for addressing the West Cumbria supply deficit, and it is possible that one of the other two options may ultimately be selected on economic or other grounds. We consider that the HRA should consider in the same level of detail all three options to provide an assessment of whether any of them could have an adverse effect on European Sites, and if so, to set out mitigation measures.

Response

HRA is slightly different to SEA, in that alternatives don't necessarily need to be assessed (although they are to some extent as part of the best-practice iterative approach). The Regulation 61 test is technically of the final plan and so if the final plan / option (i.e. Option WC01: Thirlmere Transfer into West Cumbria) is deemed to have no significant or adverse effects then the other options do not necessarily need to be considered to the same level. The HRA does not necessarily identify the 'best' option – it simply ensures / confirms that the chosen option will have no significant or adverse effect. In this instance, Option WC01 remains United Utilities' preferred option for its final WRMP and this option will be delivered unless subsequent, scheme-specific HRA determines that there will be unavoidable adverse effects; therefore, the HRA of the WRMP focuses on the assessment of this option (both in the draft HRA, and this Addendum), and it is considered that this is consistent with the requirements of Regulation 61.

Notwithstanding, it is recognised that the alternatives (Options WC14d and the Lowest Cost Option) (which demonstrate that the water requirements of West Cumbria can be met through alternative schemes if the Thirlmere option is not progressed) are effectively 'back-ups' to Option WC01 even if this status is not explicitly conferred by the WRMP. These options were reviewed in some detail as part of the HRA process, but not reported to the same level as the preferred option.

As far as HRA of the WRMP goes, it is considered that the preferred option will not (based on the information available at the strategy-level) have any adverse effects on the River Derwent and Bassenthwaite Lake SAC as a result of either its operation or construction, since potential effects can clearly be mitigated or avoided through

scheme design. Project-level HRA will be required regardless of the WRMP HRA conclusions and this additional level of assessment can be relied on to ensure that adverse effects do not occur.

United Utilities has undertaken additional engineering investigations for the Kielder scheme, which have been assessed (in this Addendum). It is considered that the Kielder scheme can be delivered with no risk of significant or adverse effects that cannot be avoided at the project stage; all the potential effects are associated with the construction phase and it is clear that potential impacts on European sites can be avoided. The engineering investigations have also removed the residual uncertainty associated with the Kielder scheme and its effects on the Border Mires SAC. It would be possible to replicate the assessment undertaken for the preferred option for Option WC14d if necessary, although it is considered very likely that most (if not all sites) would be 'screened out' and this assessment is not required to ensure compliance with the regulations.

Comment

"The WRMP states that the Habitats Regulation Assessment identified that the Wast Water option could have a significant effect on biodiversity. We cannot find any evidence in the HRA that supports that statement. The Wast Water abstraction licence was subject to Review of Consents under the Habitats Regulations at a time when the actual abstraction from the Wast Water SAC was close to the licensed volume. The RoC concluded that there was no adverse effect on integrity. As we understand it, the 10Ml/d that UU are seeking from Wast Water are within the licensed abstraction. We would certainly be concerned though if there was any proposal to increase the abstraction from the lake above the licensed amount, and that would need to be subject to HRA."

Response

The HRA suggests that "*although additional abstraction from Wastwater would be within existing licences it would be higher than recent actual so Wastwater levels would be lower on average; this would effect the River Ehen SAC, and although it is uncertain whether these changes would have significant effects (and additional modelling or studies may demonstrate 'no LSE') it is clear that this is a potentially significant risk given the effect that abstraction is currently having on the Ehen*" and that "*significant effects* [are] *possible / likely but these will not inevitably be adverse and will probably be mitigatable at the strategy / scheme level*". However, this option has been reviewed and it is concluded that there is an error in this aspect of the assessment due to misinterpretation of how the scheme would function. **We therefore conclude that this option will not have any significant effects on Wastwater SAC** since it will operate within terms of the existing licence. This is noted in **Section 2.3.3** of this Addendum.

Comment

"*We also note that although the increased abstraction (within licence) from Thirlmere will not affect low flows in St John"s Beck (part of the River Derwent & Bassenthwaite Lake SAC), there will be an effect on high flows of above Q5. The HRA concludes that this would not be likely to have an adverse effect on interest features of the SAC. The EA's Review of the Thirlmere abstraction concluded in the Stage 3 appropriate assessment that the licences do have an adverse effect because of inter alia reduction in flow variability in St Johns Beck which is a very regulated watercourse. However, the concern was related to the sort of flows needed for fish migration, and it was concluded that providing spates and reconnecting Helvellyn Gill to the river would provide the migratory flows needed. There was no argument that exercise of the licence might have an adverse effect through effect on the high flows. It would help though to see an articulation of these arguments in the HRA*".

Response

The additional information requested by Natural England has been included in **Section 2.1.3** of this Addendum to the draft HRA, which completes the assessment.

Comment

"*The Kielder Option clearly provides the security of supply that United Utilities are looking for, but at significantly greater expense than the Thirlmere option, and hence their preference for the latter. Our only comment on the assessments for this scheme concerns the Habitats Regulations Assessment and whether it adequately assesses the potential effect of running a pipeline through the group of mires that constitute the Border Mires, Kielder-Butterburn SAC. The HRA records that UU have indicated that the pipeline route would be sited within existing roads except where there were alternative routes that would have no impact on European sites. If that is possible, then we agree there should be no adverse effect on the mire SAC, but would wish to see an indicative route that demonstrates this is possible and so avoids risk of damage*."

Response

The draft HRA assumed that the Kielder pipeline would be sited within existing roads and would be routed to avoid direct or indirect effects on the Border Mires SAC. The subsequent more detailed engineering scopes produced by United Utilities have established a proposed route for the transfer pipe between Kielder and Carlisle, which is by existing roads and which avoids entirely the Border Mires SAC. An overview of the route and assessment of its likely effects on European sites is provided in **Section 2.2.2** of this Addendum.

Natural Resources Wales

Comment

Since April 1 2013, the duties and functions of the Countryside Council for Wales, Environment Agency in Wales and the Forestry Commission in Wales have been assumed by Natural Resources Wales. References to CCW and/or EAW should be amended accordingly.

Response

The dWRMP and draft HRA were submitted in March 2013. Subsequent documents, including this Addendum which completes the HRA, refer to Natural Resources Wales.

Comment

Reference should be made to Regulation 102 of the Conservation of Habitats and Species Regulations 2010 (as amended) in respect of the Habitats Regulations Assessment process for plans.

Response

Regulation 102 relates specifically to 'land use plans' – which are defined in Regulation 107. In short, WRMPs are not defined as 'land use plans' and therefore fall under Regulation 61.

Comment

We welcome the references to and use of the CCW guidance on the Appraisal of Plans under the Habitats Directive. It should be noted however, that the referenced 2010 version of this guidance was updated in 2012 to accommodate developments in Habitats Directive case law and changes to the Birds Directive.

AMEC Response

This is a typographic error; for the avoidance of doubt the latest version of all guidance was used.

Comment

We welcome the comprehensive discussion of 'uncertainty and determining significant adverse effects' and acknowledge the difficulties inherent in undertaking HRA for a plan which is subject to 'fundamental limitations' in terms of its options and alternatives. The acknowledgement of the precautionary nature of the HRA process is welcomed and we agree, in principle with this Report's discussion and conclusions on 'uncertainty'. It should be noted however, that the HRA process requires a robust demonstration that a plan or proposed project will not have a significant effect on the integrity of a European Site (alone and in combination with other plans and projects) and recognition of the need to seek avoidance, reduction and mitigation measures is an essential part of the process. We would suggest that avoidance of significant adverse effects, where possible, should always be the preferred option and especially where there is a high degree of 'uncertainty'.

Response

This is the approach that has been followed – the 'high uncertainty' options have been avoided; where uncertainty remains this exists because it cannot be avoided at this level, and so is mitigated (either by identifying measures that will be employed at the scheme level, unless not required, or by identifying alternatives which could be employed if scheme-level investigations demonstrate an unavoidable adverse effect).

Comment

We further welcome the consideration of mitigation and 'down the line assessment' however, as discussed above, mitigation measures and caveats applied at the strategic stage to lower tier plans and projects should be robust and capable of clearly demonstrating 'no likely significant effects' both alone and 'in combination'. Deferment of assessment (whether EIA or project HRA) to project level compromises the ability to consider cumulative and in combination effects and can disable the strategic consideration of alternatives. We agree that the statutory framework underpinning the WRMP does not necessarily provide the same legal requirement for project level assessment however, this challenge could be overcome if the WRMP itself included an explicit intention that all project level developments arising out of the WRMP and which had been identified at the strategic level as having the potential for significant effects (alone and in combination) on European Sites, should be subject to HRA as a matter of United Utilities' policy.

Response

The assessment is not being entirely deferred and the strategic 'in combination' assessment has been completed appropriately at the plan-level. All of the key 'strategic' issues have been addressed (e.g. water availability), and what remains are the residual uncertainties that can only be explored as part of the assessments that will inevitably take place at the project stage (e.g. construction techniques). If it is clear that significant effects can almost certainly be avoided with appropriate measures then arguably the plan is compliant, even if all of the measures cannot be precisely set out.

Regarding the commitment to project-level HRA, United Utilities has included this commitment within its final WRMP although it effectively repeats current legislation: any consenting authority (local planning authorities, the Environment Agency, or United Utilities if aspects were considered permitted development, although this is unlikely) would need to undertake project-level HRA on whatever consents they are issuing if any European sites could be affected, regardless of what the WRMP and its HRA concludes). United Utilities are also conscious that including a statement that relates specifically to those options where significant effects were identified at the strategic level may inadvertently reduce the examination of other (no LSE) options if they subsequently need to be brought forward.

Note that the statement that "*We agree that the statutory framework underpinning the WRMP does not necessarily provide the same legal requirement for project level assessment…*" does not entirely reflect what the HRA states– a project-level assessment would always be required for schemes potentially affecting a European site, regardless of whether they are included in the WRMP or any other document. The HRA states that "*It is important to note that, in contrast to land-use plans, the statutory framework underpinning the WRMP does not provide the same implicit approval of derived, lower tier plans and projects that are 'in accordance' with it; or have the same influence over the decisions made on projects; or have the same direct or indirect legal effects for the use of land and the regulation of projects*". Essentially, the inclusion of an option within the WRMP does not create a legal driver / support for its delivery which could create a tension with European legislation (in contrast to the inclusion of site allocations in a local plan, for example).

Comment

Consideration needs to be given to potential 'in combination' effects of the Feasible and Preferred options with the options, policies and proposals of other water company plans which have recently been issued for consultation including those of Dwr Cymru Welsh Water, Severn Trent and Dee Valley Water.

Response

This is recognised in the HRA (Section 5.4) and addressed in **Section 3** of this Addendum.

It should be noted that a detailed 'in combination' assessment is not undertaken at the feasible options stage, in accordance with current guidance, although the potential for options to operate 'in combination' with each other, and with other United Utilities plans (e.g. the Drought Plan) is considered but not explicitly reported in the draft; the 'in combination' assessment is completed at the preferred options stage, and alternative options selected if any of the preferred options have a risk of significant 'in combination' effects.

Comment

Reference is made within this document to 'European Sites within 15km or downstream' of a proposed option. It should be noted that proposed options have, in many cases, the potential to affect European Sites both upstream and downstream of any project, particularly where migratory species are features of interest and/or where 'mobile species' (features of interest on a European Site but not necessarily confined within a site) such as otter are involved.

Response

The HRA states "*…all European sites that are within 15km or directly downstream of a supply-side option are included in the 'screening',* ***with sites beyond this considered on an option-by-option basis depending on the site interest features and how the option would function***". Therefore, all upstream sites within 15km are considered, together with any other sites (including upstream sites) that could be affected, based on the sensitivities of the interest features. Sites with migratory or mobile species, upstream or otherwise, are therefore accounted for, and most of the assessments explicitly consider mobile species.