



2015 Drought Plan

HRA Screening Report

July 2015



In this HRA scoping study, we have reviewed the drought options developed within the main report of our drought plan and assessed their potential impact on European conservation sites. From our review we have determined that none of the options which are proposed are likely to have any adverse effects.

CONTENTS

1	Introduction.....	1
2	HRA Stages.....	2
3	Drought options.....	2
4	Screening.....	3
4.1	European sites for assessment	3
4.2	Location of sites	4
4.3	Qualifying features and conservation objectives	5
4.3.1	Midland Meres and Mosses Phase 2 Ramsar (Wales/England)	5
4.3.2	Fenn’s Whixall, Bettisfield, Wem and Cadney Mosses SAC (Wales/England)	5
4.3.3	Johnstown Newt Sites SAC (Wales)	6
4.3.4	River Dee and Bala Lake SAC (Wales/England)	6
4.3.5	Berwyn and South Clwyd Mountains SAC/SPA (Wales).....	7
4.3.6	The Dee Estuary SAC/SPA/Ramsar (Wales/England).....	8
5	HRA Screening.....	9
6	Conclusions.....	15
7	References.....	17
	Appendix A – Potential impacts on European sites.....	18

1 INTRODUCTION

As Dee Valley Water, we are the competent authority for the Drought Plan, including the Strategic Environmental Assessment (SEA) and Habitats Regulation Assessment (HRA). Regulation 9(5) of the Conservation of Habitats and Species Regulations 2010 (as Amended by the Conservation of Habitats and Species (Amendment) Regulations 2011) (referred to as the Habitats Regulations) requires every competent authority, in the exercise of any of its functions, to have regard to the requirements of the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna).

As part of the drought planning process, we have undertaken the first stage of the HRA to screen for likely significant effects on the qualifying features of European sites which the Drought Plan may have alone or in-combination with other plans. European sites which have been included in the assessment are Special Areas of Conservation (SACs), Special Protection Areas (SPA's) and Ramsar sites. The inclusion of Ramsar sites within the definition is in line with Government policy.

2 HRA STAGES

This HRA has four main stages, these are:

- **Screening** – Identifies likely impacts of the drought options and whether they are likely to be significant. The assessment is made of the options alone and in combination with other plans or projects.
- **Appropriate Assessment** – Assesses the impacts of the Drought Plan on the European sites and determines if their integrity will be effected.
- **Alternative solutions** – Any available alternative solutions are evaluated and their impacts compared with the options identified in the Drought Plan.
- **Assessment where adverse impacts remain** – Assesses the necessity of options with adverse impacts where no alternatives are available and the requirements for compensatory measures.

This document comprises Stage 1 and 2 of the HRA.

3 DROUGHT OPTIONS

Within our Drought Plan we have identified a number drought options which we will implement in the event that a drought occurs. The implementation of the options are dependent on specific triggers being reached, these triggers have been detailed in the main report. The drought options that have been proposed are:

- Drought publicity
- Increased leakage detection and repair activity
- Water use restrictions
- Implementation of ordinary drought orders
- Augmentation of the River Dee with water from Pen-y-Cae Reservoir

From the above options, the only one that may have a detrimental impact on the environment is the augmentation of the River Dee with water from Pen-y-Cae Reservoir.

4 SCREENING

4.1 European sites for assessment

The following European sites were recognised as having the potential to be adversely impacted by the drought options identified within the Drought Plan. These sites have been investigated further within this HRA screening report:

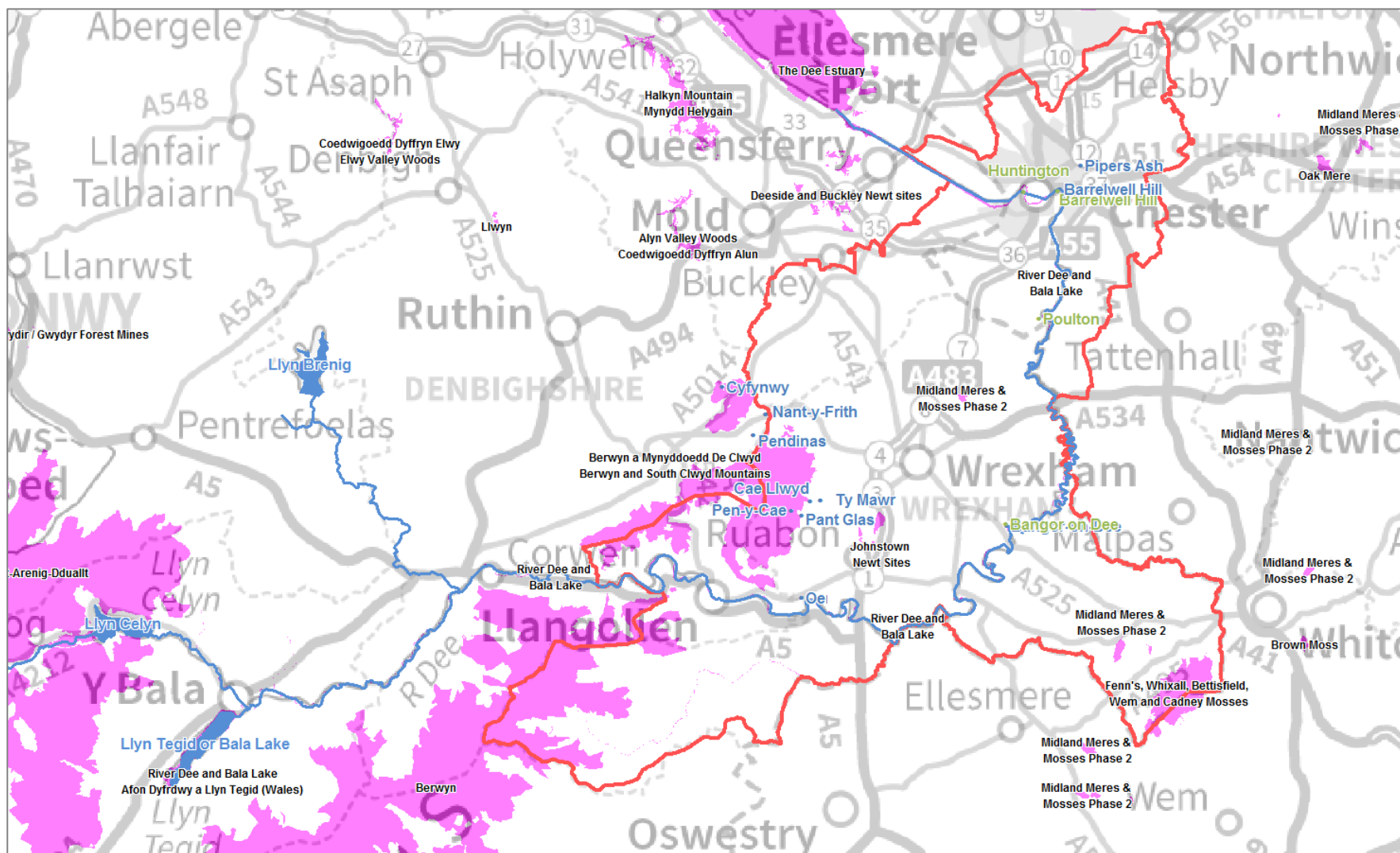
- Midland Meres and Mosses Phase 2 (Ramsar)
- Fenn's Whixall, Bettisfield, Wem and Cadney Mosses (SAC)
- Johnstown Newt Sites (SAC)
- River Dee and Bala Lake. Afon Dyfrdwy a Llyn Tegid (SAC)
- Berwyn and South Clwyd Mountains (SAC/SPA)
- The Dee Estuary (SAC/SPA/Ramsar)

The following European sites were recognised as being close to our Supply Area but were screened out early on as it was felt that the drought options were unlikely to cause any adverse impacts:

- Halkyn Mountains (SAC)
- Brown Moss (SAC)
- Oakmere (SAC)
- Deeside and Buckley Newt Site (SAC)
- Alyn Valley Woods (SAC)

4.2 Location of sites

The plan below shows the location of our sources in relation to the European conservation sites. Pen-y-Cae Reservoir has been highlighted as it resides within the Berwyn and South Clwyd Mountains SAC/SPA and has a drought option associated with it.



4.3 Qualifying features and conservation objectives

4.3.1 Midland Meres and Mosses Phase 2¹ Ramsar (Wales/England)

Qualifying features

- Ramsar Criteria 1 – Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary.
- Ramsar Criteria 2 – The site supports a number of rare species of plants associated with wetlands, including the nationally scarce cowbane *Cicuta virosa* and, elongated sedge *Carex elongata*. Also present are the nationally scarce bryophytes *Dicranum affine* and *Sphagnum pulchrum*. Also supports an assemblage of invertebrates including several rare species. There are 16 species of British Red Data Book insect listed for this site including the following endangered species: the moth *Glyphipteryx lathamella*, the caddisfly *Hagenella clathrata* and the sawfly *Trichiosoma vitellinae*.

Conservation objectives²

- To conserve and enhance the priority areas of the Meres and Mosses Natural Area, aiming to achieve a sustainable and functioning landscape.
- To raise public awareness and understanding of the key issues in the Natural Area and promote appreciation of the area for recreation.
- To assist understanding of the complex interactions of water, geology and land management within the Meres and Mosses.

4.3.2 Fenn's Whixall, Bettisfield, Wem and Cadney Mosses SAC (Wales/England)

Qualifying features³

- Active raised bogs
- Degraded raised bogs still capable of natural regeneration

Conservation objectives⁴

Subject to natural change, to maintain or restore:

- The extent, distribution and function (including typical species) of qualifying natural habitats and habitats of qualifying species.
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely.
- The populations of qualifying species.
- The distribution of qualifying species within the site.

¹ <http://jncc.defra.gov.uk/pdf/RIS/UK11080.pdf>

² <http://www.cheshire-biodiversity.org.uk/action-plans/listing.php?id=27>

³ <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0012912.pdf>

⁴ http://www.naturalengland.org.uk/Images/UK0012912-Fenns-Whixall-Bettisfield-Wem-and-Cadney-Mosses-SAC_tcm6-32039.pdf

4.3.3 Johnstown Newt Sites SAC (Wales)

*Qualifying features*⁵

- Great crested newt (*Triturus cristatus*)

*Conservation objectives*⁶

A detailed list of the conservation objectives for this site are listed in the Johnstown Newt Sites Special Area of Conservation Core Management. The key points that have been identified from this list are:

- No less than 300 great crested newts will be present on the site.
- At least 30 display/breeding ponds will be found throughout the entire site.
- Great crested newt larvae will be found in 7 or more of the breeding ponds.

4.3.4 River Dee and Bala Lake SAC (Wales/England)

*Qualifying features*⁷

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion*
- *Tilio-Acerion* forests of slopes, screes and ravines
- Old sessile oak woods with *Ilex* and *Blechnum* vegetation in the British Isles
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
- Atlantic salmon (*Salmo salar*)
- Floating water-plantain (*Luronium natans*)
- Sea lamprey (*Petromyzon marinus*)
- Brook lamprey (*Lampetra planeri*)
- River lamprey (*Lampetra fluviatilis*)
- Bullhead (*Cottus gobio*)
- Otter (*Lutra lutra*)

*Conservation objectives*⁸

A detailed list of the conservation objectives for this site are listed in the River Dee and Bala Lake Special Area of Conservation Core Management. The key points that have been identified from this list are:

- Whilst not a feature in its own right, the water course is essential to the maintenance and improvement of the other site features. The ecological status of the water environment should be sufficient to maintain a stable or increasing

⁵ <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0030173.pdf>

⁶ <http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/halkyn-to-mynydd-sac-list/johnstown-newt-sites-sac.aspx>

⁷ <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0030252.pdf>

⁸ <http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/river-to-usk-sac-list/river-dee-and-bala-lake-sac.aspx>

population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure.

- The extent of features or feature populations (within their potential ranges) should be stable or increasing.

4.3.5 Berwyn and South Clwyd Mountains SAC/SPA (Wales)

Qualifying features⁹

- European dry heaths
- Blanket bogs
- Semi-natural dry grasslands and scrubland facies on calcareous substrates
- Transition mires
- Quaking bogs
- Calcareous and calshist screes of the montane to alpine levels
- Calcareous rocks slopes with chasmophytic vegetation
- Hen harrier
- Merlin
- Peregrine
- Red kite

Conservation objectives¹⁰

A detailed list of the conservation objectives for this site are listed in the Berwyn and South Clwyd Mountains Special Area of Conservation Core Management. The key ones that have been identified from this list are:

- There will be no measurable decline of dry heath area, blanket bog, transition mires or quaking bogs; the area of these habitats must be stable or increasing.
- The extent of the calcareous and neutral grasslands should be maintained or increase in size at the expense of bracken, scrub and other more improved grasslands.
- There will be no measurable decline of Calcareous and calshist screes or Calcareous rocks slopes with chasmophytic vegetation, the area of these habitats must be stable but due to its nature an increase in extent is unlikely.
- The size of the populations of the hen harrier, merlin, peregrine and red kite must be being maintained or increased beyond the number stated.

⁹ <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0012926.pdf>

¹⁰ <http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/berwyn-spa.aspx>

4.3.6 The Dee Estuary SAC/SPA/Ramsar (Wales/England)

Qualifying features^{11,12&13}

- Ramsar Criteria 1 – The site comprises a diverse range of habitats from open water to raised bog.
- Ramsar Criteria 2 – Supports breeding colonies of the vulnerable Natterjack Toad, *Epidalea calamita*
- Ramsar Criteria 5 – The wetland area regularly supports more than 20,000 or more water birds (120,726 individual waterbirds - 5 year peak mean 1994/5 – 1998/9).
- Ramsar Criteria 6 - The wetland regularly supports 1% of the individuals in a population of one species or subspecies of waterbird. Qualifying species include (amongst others): Redshank, Teal, Shelduck, Oystercatcher, Curlew and Pintail.
- Estuaries
- Annual vegetation of drift lines
- Vegetated sea cliffs of the Atlantic and Baltic Coasts
- Embryonic shifting dunes
- "Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")"
- "Fixed coastal dunes with herbaceous vegetation ("grey dunes")"
- Humid dune slacks
- Sea lamprey *Petromyzon marinus*
- River lamprey *Lampetra fluviatilis*
- Petalwort *Petalophyllum ralfsii*
- A number of species under Annex 1 Article 4.1 and 4.2 of the Birds Directive.

Conservation objectives

- The aggregate total extent of all estuarine communities within the site is maintained.
- The spatial distribution of estuarine communities within the site is maintained.
- The extent of individual estuarine habitat features within the site is maintained
- The variety and relative proportions of sediment and rocky substrates within the estuary is maintained.
- The variety and extent of any notable sub-tidal sediment communities is maintained.
- The variety and extent of notable intertidal hard substrata communities is maintained.
- The spatial and temporal patterns of salinity, suspended sediments and nutrients concentrations are maintained within limits sufficient to satisfy the requirements of the above.

¹¹ <http://jncc.defra.gov.uk/pdf/RIS/UK11082.pdf>

¹² <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCODE=UK0030131>

¹³ <http://jncc.defra.gov.uk/pdf/SPA/UK9013011.pdf>

5 HRA SCREENING

Within the UKWIR document *Strategic Environmental Assessment and Habitats Regulations Assessment – Guidance for Water Resources Management Plans and Drought Plans (2012)* a list of potential impacts that may result from the implementation of drought options has been developed. The broad categories of these potential impacts are given below, a more detailed list is given in Appendix A – Potential impacts on European sites:

- Physical loss
- Physical damage
- Non-physical disturbance
- Water table/availability
- Non-toxic contamination (Changes in salinity, thermal regime, turbidity etc)
- Biological disturbance

Table 1 shows a high level assessment of the potential impacts of each drought option on the European sites within our Supply Area. The following symbols have been used to indicate the likely effects:

- ✖ - No likely significant effect
- ? – Effect undetermined at this stage

Site / Drought option	Physical loss	Physical damage	Non-physical disturbance	Water table/availability	Non-toxic contamination	Biological disturbance
Midland Meres and Mosses Phase 2 (Ramsar)						
• Drought publicity	✖	✖	✖	✖	✖	✖
• Increased leakage detection and repair activity	✖	✖	✖	✖	✖	✖
• Water use restrictions	✖	✖	✖	✖	✖	✖
• Implementation of ordinary drought orders	✖	✖	✖	✖	✖	✖
• Augmentation of the River Dee with water from Pen-y-Cae Reservoir	✖	✖	✖	✖	✖	✖
Fenn's Whixall, Bettisfield, Wenn and Cadney Mosses (SAC)						
• Drought publicity	✖	✖	✖	✖	✖	✖
• Increased leakage detection and repair activity	✖	✖	✖	✖	✖	✖
• Water use restrictions	✖	✖	✖	✖	✖	✖
• Implementation of ordinary drought orders	✖	✖	✖	✖	✖	✖
• Augmentation of the River Dee with water from Pen-y-Cae Reservoir	✖	✖	✖	✖	✖	✖
Johnstown Newt Sites (SAC)						
• Drought publicity	✖	✖	✖	✖	✖	✖
• Increased leakage detection and repair activity	✖	✖	✖	✖	✖	✖
• Water use restrictions	✖	✖	✖	✖	✖	✖
• Implementation of ordinary drought orders	✖	✖	✖	✖	✖	✖
• Augmentation of the River Dee with water from Pen-y-Cae Reservoir	✖	✖	✖	✖	✖	✖
River Dee and Bala Lake. Afon Dyfrdwy a Llyn Tegid (SAC)						
• Drought publicity	✖	✖	✖	✖	✖	✖
• Increased leakage detection and repair activity	✖	✖	✖	✖	✖	✖
• Water use restrictions	✖	✖	✖	✖	✖	✖

Site / Drought option	Physical loss	Physical damage	Non-physical disturbance	Water table/availability	Non-toxic contamination	Biological disturbance
• Implementation of ordinary drought orders	✖	✖	✖	✖	✖	✖
• Augmentation of the River Dee with water from Pen-y-Cae Reservoir	✖	✖	✖	✖	?	✖
Berwyn and South Clwyd Mountains (SAC/SPA)						
• Drought publicity	✖	✖	✖	✖	✖	✖
• Increased leakage detection and repair activity	✖	✖	✖	✖	✖	✖
• Water use restrictions	✖	✖	✖	✖	✖	✖
• Implementation of ordinary drought orders	✖	✖	✖	✖	✖	✖
• Augmentation of the River Dee with water from Pen-y-Cae Reservoir	✖	✖	✖	?	✖	✖
The Dee Estuary (SAC/SPA/Ramsar)						
• Drought publicity	✖	✖	✖	✖	✖	✖
• Increased leakage detection and repair activity	✖	✖	✖	✖	✖	✖
• Water use restrictions	✖	✖	✖	✖	✖	✖
• Implementation of ordinary drought orders	✖	✖	✖	✖	✖	✖
• Augmentation of the River Dee with water from Pen-y-Cae Reservoir	✖	✖	✖	?	✖	✖

Table 1: Summary of potential impacts of drought options

Based on this high level assessment, the only option that could have a potential impact on any of the sites is the augmentation of the River Dee with water from Pen-y-Cae Reservoir. This option has the potential to impact three European Sites; the Berwyn and South Clwyd Mountains SAC/SPA, the River Dee and Bala Lake SAC and the Dee Estuary SAC/SPA/Ramsar.

The River Dee and in turn the Dee Estuary maybe impacted through non-toxic contamination as water will be transferred from Pen-y-Cae Reservoir into the river. There is also the remote possibility that any non-toxic contamination could impact abstractors downstream (United Utilities) of the augmentation site.

Under normal conditions additional water in Pen-y-Cae Reservoir (which is not abstracted for use) feeds the River Dee and in turn the Dee Estuary via Trefechan Brook. This suggests that non-toxic contamination is unlikely to impact these sites or downstream abstractors.

There is the possibility that the Berwyn and South Clwyd Mountains could be impacted through the augmentation of the River Dee with water from Pen-y-Cae Reservoir which is located within the SAC/SPA. However, as we do not plan to abstract below the minimum operating volume or outside our abstraction licence this risk is minimal.

As well as being assessed as a standalone plan we have also assessed our Drought Plan in combination with other Companies' Drought Plans in particular Severn Trent Water and United Utilities (Dwr Cymru's is currently not available).

United Utilities abstract water from the River Dee to supply their Integrated Resource Zone. The Integrated Resource Zone covers 95% of the Company's population and has

numerous groundwater and surface water sources. The drought triggers for the Integrated Resource Zone are set higher than those in the Dee Drought Directions due to the complexity of the resource zone and the interaction of sources within it. United Utilities do not propose any drought options relating directly to the River Dee but do propose drought options associated with boreholes that are in the proximity of the River Dee and Bala Lake and the Dee Estuary sites. However, no potential adverse impacts on these sites, as a result of these options, were identified.

To be confident that the conclusions from the high level assessment, a more in depth assessment has been carried out, the results of which are shown in Table 2.

Drought Option	European Site	Qualifying features	Potential for effects on qualifying features?	Effect from option alone?	Effect from combination with other plans/projects	Is option likely to have a significant effect on European Sites?
Augmentation of the River Dee with water from Pen-y-Cae Reservoir	River Dee and Bala Lake. Afon Dyfrdwy a Llyn Tegid (SAC)	<ul style="list-style-type: none"> • Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> • <i>Tilio-Acerion</i> forests of slopes, screes and ravines • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> vegetation in the British Isles • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) • Atlantic salmon (<i>Salmo salar</i>) • Floating water-plantain (<i>Luronium natans</i>) • Sea lamprey (<i>Petromyzon marinus</i>) • Brook lamprey (<i>Lampetra planeri</i>) • River lamprey (<i>Lampetra fluviatilis</i>) • Bullhead (<i>Cottus gobio</i>) • Otter (<i>Lutra lutra</i>) 	<p>Water will be transferred from Pen-y-Cae Reservoir in to the River Dee via an existing pipe.</p> <p>No construction work is required for this option.</p> <p>Non-toxic contamination is deemed to be unlikely.</p> <p>The proposed option is unlikely to impact any of the qualifying features of this site.</p>	✗	✗	✗

Drought Option	European Site	Qualifying features	Potential for effects on qualifying features?	Effect from option alone?	Effect from combination with other plans/ projects	Is option likely to have a significant effect on European Sites?
Augmentation of the River Dee with water from Pen-y-Cae Reservoir	Dee Estuary SAC/SPA/ Ramsar	<ul style="list-style-type: none"> • Ramsar Criteria 1 – The site comprises a diverse range of habitats from open water to raised bog. • Ramsar Criteria 2 – Supports breeding colonies of the vulnerable Natterjack Toad, <i>Epidalea calamita</i> • Ramsar Criteria 5 – The wetland area regularly supports more than 20,000 or more water birds (120,726 individual waterbirds - 5 year peak mean 1994/5 – 1998/9). • Ramsar Criteria 6 - The wetland regularly supports 1% of the individuals in a population of one species or subspecies of waterbird. Qualifying species include (amongst others): Redshank, Teal, Shelduck, Oystercatcher, Curlew and Pintail. • Estuaries • Annual vegetation of drift lines • Vegetated sea cliffs of the Atlantic and Baltic Coasts • Embryonic shifting dunes • "Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")" • "Fixed coastal dunes with herbaceous vegetation ("grey dunes")" • Humid dune slacks • Sea lamprey <i>Petromyzon marinus</i> • River lamprey <i>Lampetra fluviatilis</i> • Petalwort <i>Petalophyllum ralfsii</i> • A number of species under Annex 1 Article 4.1 and 4.2 of the Birds Directive. 	<p>Non-toxic contamination is deemed to be unlikely.</p> <p>The proposed option is unlikely to impact any of the qualifying features of this site.</p>			

Drought Option	European Site	Qualifying features	Potential for effects on qualifying features?	Effect from option alone?	Effect from combination with other plans/ projects	Is option likely to have a significant effect on European Sites?
Augmentation of the River Dee with water from Pen-y-Cae Reservoir	Berwyn and South Clwyd Mountains (SAC/SPA)	<ul style="list-style-type: none"> • European dry heaths • Blanket bogs • Semi-natural dry grasslands and scrubland facies on calcareous substrates • Transition mires • Quaking bogs • Calcareous and calshist screes of the montane to alpine levels • Calcareous rocks slopes with chasmophytic vegetation • Hen harrier • Merlin • Peregrine • Red kite 	<p>We do not plan to abstract below the minimum operating volume of Pen-y-Cae Reservoir or abstract outside our abstraction licence agreements.</p> <p>No construction work is required for this option.</p> <p>The proposed option is unlikely to impact any of the qualifying features of this site.</p>	✖	✖	✖

Table 2: Habitats Regulations screening of the drought option to augment the River Dee with water from Pen-y-Cae Reservoir

6 CONCLUSIONS

There are six designated sites (either SAC, SPA, Ramsar or a combination) within or partially within our Supply Area. The only European sites where the identified drought options pose a risk of adverse impacts are the River Dee and Bala Lake SAC the Dee Estuary SAC/SPA/Ramsar and the Berwyn and South Clwyd Mountains SAC/SPA. The drought option which poses a risk is our intention to augment the River Dee with water abstracted from Pen-y-Cae Reservoir which is located within the Berwyn and South Clwyd Mountains.

It was identified that the River Dee and in turn the Dee estuary may be impacted through non-toxic contamination (changes in sedimentation, thermal regime, turbidity etc) as water will be transferred from Pen-y-Cae Reservoir into the river. However, this was deemed unlikely as under normal conditions additional water in Pen-y-Cae Reservoir (which is not abstracted for use) feeds the River Dee via Trefechan Brook. The risk of non-toxic contamination impacting abstractors downstream (United Utilities) of the augmentation site was also considered to be unlikely.

It was also identified that the Berwyn and South Clwyd Mountains could be impacted through the augmentation of the River Dee with water from Pen-y-Cae Reservoir which is located within the SAC/SPA. However, this was also deemed unlikely as we do not plan to abstract below the minimum operating volume or outside our abstraction licence.

From the HRA screening report we have concluded that neither the River Dee and Bala Lake SAC nor the Berwyn and South Clwyd Mountains SAC/SPA would be adversely impacted by the augmentation of the River Dee with water abstracted from Pen-y-Cae Reservoir.

Natural Resources Wales have undertaken a review of the licences and permissions which could affect European and national designated sites through a process called the Review of Consents (ROC). From the ROC, the integrity of the River Dee and Bala Lake SAC was identified as being at risk from fish entrainment, due to the river abstractions carried out by ourselves (amongst other companies). As a result of this in April 2006 we commissioned a fish entrainment study (jointly with United Utilities and Dwr Cymru/Welsh Water) to assess the significance of the level of entrainment of salmon at our intakes from the River Dee, the findings of the survey showed that no action was required at our intakes.

Since then *The Eels (England and Wales) Regulation 2009* have set out additional duties to provide appropriate screening to reduce the loss of eels from their natural environment. In agreement with Natural Resources Wales and the Environment Agency, we plan to undertake eel surveys at our intakes on the River Dee during 2016/17 in a joint study with United Utilities and Dwr Cymru to assess the level of entrainment. The output from the study will determine whether improvements to the screening structures will be required.

Our Drought Plan alone or in combination with other Drought Plans or other spatial plans will not lead to measures or works that will increase the present risk to European

sites within the Supply Area. Therefore, it can be concluded that the Drought Plan will have no likely significant effects on any European site.

7 REFERENCES

Periodic review 2014, Business Plan for 2015-20, Dee Valley Water (December 2013)

Strategic Environmental Assessment and Habitats Regulations Assessment – Guidance for Water Resources Management Plans and Drought Plans UKWIR (2012)

Drought permits and drought orders, Information from the Department of Environment, Food and Rural Affairs, Welsh Assembly Government and the Environment Agency (May 2011)

Water Company Drought Plan Guideline, Environment Agency (June 2011)

A Practical Guide to the Strategic Environmental Assessment Directive, Scottish Executive, Welsh Assembly Government, Department of the Environment, Northern Ireland, Office of the Deputy Prime Minister: London (September 2005)

APPENDIX A – POTENTIAL IMPACTS ON EUROPEAN SITES

Broad categories of potential impacts on European sites, with examples	Examples of operations responsible for impacts (Distance assumptions shown in <i>italics</i>)
Physical loss <ul style="list-style-type: none"> - Destruction (including offsite effects, e.g. foraging habitat) - Smothering 	<p>Development of built infrastructure associated with scheme, e.g. pipelines, transport infrastructure, temporary weirs.</p> <p><i>Physical loss is only likely to be significant where the boundary of the scheme extends within the boundary of the European site, or within an offsite area of known foraging, roosting, breeding habitat (that supports species for which a European site is designated).</i></p>
Physical damage <ul style="list-style-type: none"> - Sedimentation / silting - Prevention of natural processes - Habitat degradation - Erosion - Fragmentation - Severance/barrier effect - Edge effects 	<p>Development of built infrastructure associated with scheme, e.g. temporary weirs.</p> <p><i>Physical damage is only likely to be significant where the boundary of the scheme extends within or is directly adjacent to the boundary of the European site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a European site is designated).</i></p>
Non-physical disturbance <ul style="list-style-type: none"> - Noise - Visual presence - Human presence - Light pollution 	<p>Noise from vehicular traffic during construction of scheme.</p> <p><i>Noise from construction traffic is only likely to be significant where the transport route to and from the scheme is within 3-5km of the boundary of the European site.</i></p> <p>Plant and personnel involved in construction and operation of schemes e.g. for maintenance, plus non-operational activities such as recreation associated with scheme e.g. reservoirs</p> <p>Development of built infrastructure associated with scheme, which includes artificial lighting.</p> <p><i>Effects from light pollution are only likely to be significant where the boundary of the scheme is within 500 m of the boundary of the European site. From a review of Environment Agency internal guidance on HRA and various websites it is considered that effects of vibration and noise and light are more likely to be significant if development is within 500 metres of a European site.</i></p>
Water table/availability <ul style="list-style-type: none"> - Drying - Flooding / stormwater - Changes to surface water levels and flows - Changes in groundwater levels and flows - Changes to coastal water movement 	<p>Changes to water levels and flows due to water abstraction and storage.</p> <p><i>These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the European site. However, these effects are dependent on hydrological continuity between the scheme and the European site, and sometimes, whether the scheme is up or down stream from the European site.</i></p>
Non toxic contamination <ul style="list-style-type: none"> - Nutrient enrichment (e.g. of soils and water) - Algal blooms - Changes in salinity - Changes in thermal regime - Changes in turbidity - Changes in sedimentation/silting 	<p>Changes to water salinity, nutrient levels, turbidity, thermal regime due to water abstraction, storage, or inter-catchment transfers.</p> <p><i>These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the European site. However, these effects are dependent on hydrological continuity between the scheme and the European site, and sometimes, whether the scheme is up or down stream from the European site.</i></p>

Broad categories of potential impacts on European sites, with examples	Examples of operations responsible for impacts (Distance assumptions shown in <i>italics</i>)
Biological disturbance <ul style="list-style-type: none"> - Direct mortality - Changes to habitat availability - Out-competition by non-native species - Selective extraction of species - Introduction of disease - Rapid population fluctuations - Natural succession 	<p>Potential for changes to habitat availability, for example reductions in wetted width of rivers leading to desiccation of macrophyte beds due to changes in abstraction or reduced compensation flow.</p> <p><i>This effect is only likely to be significant where the receiving water for the scheme is the European site or a tributary of the European site.</i></p>