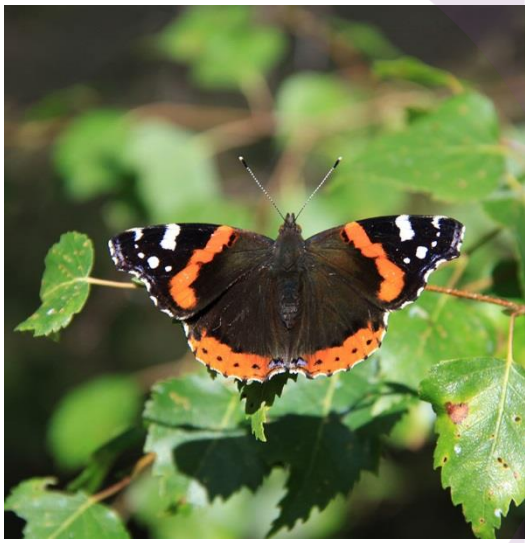
Dŵr Cymru Welsh Water

Habitats Regulations Assessment of the Drought Plan 2020

Habitats Regulations Assessment Report



Wood Environment & Infrastructure Solutions UK Limited – October 2019

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1	Draft HRA Report for Draft Drought Plan Consultation	21.3.19
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Executive summary

Drought Plan 2020

Dŵr Cymru Welsh Water (Welsh Water) is currently preparing its Drought Plan 2020. The Drought Plan will detail how Welsh Water intends to respond to drought conditions, ensuring the continued supply of potable water to its customers during periods of low rainfall when water resources are depleted whilst minimising any detrimental effects on the environment.

Regulation 63 of the *Conservation of Habitats and Species Regulations 2017* (the 'Habitats Regulations') states that if a plan or project is "*(a) is likely to have a significant effect on a European site*[1] *or a European offshore marine site*[2] *(either alone or in combination with other plans or projects); and (b) is not directly connected with or necessary to the management of the site*" then the plan-making authority must "*…make an appropriate assessment of the implications for the site in view of that site's conservation objectives*" before the plan is given effect. The process by which Regulation 63 is met is known as Habitats Regulations Assessment (HRA)[3]. An HRA determines whether there will be any 'likely significant effects' (LSE) on any European site as a result of a 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 site integrity. Welsh Water has a statutory duty to prepare its Drought Plan and is therefore the Competent Authority for any HRA.

Whilst the Drought Plan is a strategic planning document it is, in essence, a collection of individual proposals or options that Welsh Water will implement at different stages in a drought; this creates a number of challenges for a 'plan level' HRA. Welsh Water has prepared 20 Environmental Assessment Reports (EARs) in support of the Drought Plan; these are substantial reports that describe the environmental impact of drought measures, which are required to support applications for a Drought Permit or Drought Order. Each EAR is prepared as a 'shelf-copy' report which would be updated in the event that Welsh Water needs to make an application during any future drought to Natural Resources Wales (NRW) for a Drought Permit or Drought Order. The EARs are the principal assessments or data sources relating to the operation of the options and their hydrological effects on European site, and so form the assessment basis of the HRA of the Drought Plan. The EARs will (if employed in a drought) then form the basis of any HRA required of the Drought Permit or Drought Order. It should be noted that EARs have their own terminology when assessing the significance of effects; in particular, the use of the phrase 'adverse effect' in an EAR does not equate to 'adverse effects on integrity' in HRA terms.

HRA Screening

The HRA of the Revised Draft Drought Plan uses the information in the EARs as a basis for 'screening' European sites that are hydrologically linked to the option operation, with other sites (e.g. sites with mobile species that may be exposed to 'non-hydrological' effects, such as from construction requirements) also

[1] Strictly, 'European sites' are: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agree the site as a 'Site of Community Importance' (SCI); any classified Special Protection Area (SPA); any candidate SAC (cSAC); and (exceptionally) any other site or area that the Commission believes should be considered as an SAC but which has not been identified by the Government. However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') apply; and to possible SACs (pSACs) and listed Ramsar Sites, to which the provisions of the Habitats Regulations are applied a matter of Government policy (TAN5 para. 5.1.3) when considering development proposals that may affect them. "European site" is therefore used in this report in its broadest sense, as an umbrella term for all of the above designated sites. Additional information on European site designations is provided in **Appendix A**.

[2] 'European offshore marine sites' are defined by Regulation 15 of *The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* (as amended); these regulations cover waters (and hence sites) over 12 nautical miles from the coast.

[3] The term 'Appropriate Assessment' has been historically used to describe the process of assessment; however, the process is now more accurately termed 'Habitats Regulations Assessment' (HRA), with the term 'Appropriate Assessment' limited to the specific stage within the process.

subject to 'screening'. In practice, the screening of the Revised Draft Drought Plan considers all European sites within 20km of the location of any operational facilities or infrastructure required to deliver each option (including temporary infrastructure), plus any additional sites that might be hydrologically connected to the operational zone of influence. Mitigation measures are not accounted for at screening, in accordance with the 'People Over Wind'[4] case.

The screening concluded that significant effects (alone or in combination) are either likely, or could not be self-evidently excluded, for our options (see **Table A** below). These sites and options were therefore taken forward to an appropriate assessment stage.

Table A Summary of options and sites requiring 'appropriate assessment'

Option	Summary	European sites	Alone or IC?
8033-2	Reduce compensation water releases from Llyn Bodlyn	• Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	Alone
8201-3	Relax the maintained requirement below the Nantgaredig intake on the River Tywi	• Afon Tywi/ River Tywi SAC • Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC	Alone Alone
8206-2	Reduce the Compensation release from Preseli Reservoir by 50%	• Afonydd Cleddau/ Cleddau Rivers SAC	Alone

In addition, the potential for construction works associated with the **demand management/leakage reduction** options (taking into account anticipated mitigation measures) was also taken forward to 'appropriate assessment'.

Appropriate Assessment

'Appropriate assessments' of the options taken forward following screening were undertaken (based on the EARs and in as much detail as can be achieved ahead of option delivery); these considered the environmental changes associated with each option and determined whether they would result in adverse effects on the integrity of any European sites. These 'appropriate assessments' are reported separately, and summarised within this HRA. The appropriate assessments concluded that there would be no adverse effects on integrity of any European sites as a result of option implementation.

The plan-level HRA also considered 'in combination effects' with other plans and programmes; this concluded that adverse effects would not occur, although obviously this conclusion would necessarily be subject to review if a Drought Option is deployed in the future and HRA is required.

The HRA of the Revised Draft Drought Plan therefore concludes that **no adverse effects on the integrity of any European sites will occur** based on the information available and the predicted operation of each option.

[4] Case C 323/17 Court of Justice of the European Union: People Over Wind

Contents

1. Introduction

1.1 Welsh Water's Drought Plan 2020

Requirement to Prepare a Drought Plan

Dŵr Cymru Welsh Water (Welsh Water) provides water services to some 3 million customers in much of Wales and small parts of Cheshire and Herefordshire in England. It also has over 100,000 business customers and in total delivers more than 800 million litres of drinking water every day. Welsh Water supplies come primarily from surface water resources such as rivers and reservoirs (95 per cent of its total resources); groundwater sources constitute the remaining water resources, reflecting the geology of Wales which is unsuitable for supporting large scale groundwater supplies.

Under sections 39B and 39C of the Water Industry Act 1991 (as amended by the Water Act 2003), all water companies in England and Wales are required to prepare and maintain statutory drought plans. Drought plans set out the operational steps a water company will take before, during and after a drought to maintain essential water supplies to customers. The Water Industry Act 1991 (as amended) defines a drought plan as "*a plan for how the water undertaker will continue, during a period of drought, to discharge its duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits*".

Welsh Water's current Drought Plan[5] was published in July 2015 and the company is currently preparing its next plan that will cover the period 2020 to 2025. The Drought Plan 2020 is being prepared in accordance with the guidance on drought plans published by the Welsh Government[6] and Natural Resources Wales (NRW) guidance[7] and as Welsh Water's operational area includes small parts of Cheshire and Herefordshire, also the Department for Environment, Food & Rural Affairs' (Defra's) and the Environment Agency's (EA's) guidance[8,9]. The Drought Plan will detail how Welsh Water intends to respond to drought conditions, ensuring the continued supply of potable water to its customers during periods of low rainfall when water resources are depleted whilst minimising any detrimental effects on the environment. It will build on earlier Drought Plans that have been developed and will be prepared in accordance with the relevant guidance. The Drought Plan is linked to other key Welsh Water strategies such as Welsh Water 2050 and the Final Water Resources Management Plan 2019.

As part of the preparation of the Drought Plan 2020, Welsh Water consulted on its draft Drought Plan in order that regulators, stakeholders and the public could comment on its proposals for dealing with drought and contribute to the development of the plan. Following consultation, Welsh Water has prepared a Statement of Response to the representations received and where required amended the draft Drought Plan and the Environmental Report to reflect the changes arising from the consultation submissions. Welsh Water will send the revised documentation to the Welsh Government for confirmation that all representations have

[5] Welsh Water (2015) *Drought Plan 2015*. Available online: https://www.dwrcymru.com/en/My-Water/Water-Resources/Drought-Plan.aspx [Accessed November 2018]

[6] Welsh Government (2017) *Guiding Principles for Developing Water Undertaker Drought Plans for 2020*. Available online: https://gov.wales/docs/desh/publications/171030-drought-plan-guiding-principles-en.pdf [Accessed November 2018]

[7] NRW (2017), *Water Company Drought Plan Technical Guideline*, December 2017. Available online: https://cdn.naturalresources.wales/media/684414/final-wc-drought-plan-guidance-2017.pdf?mode=pad&rnd=131656713580000000 [Accessed November 2018]

[8] Defra and the Environment Agency (2017) *How to Write a Drought Management Plan.* Available online: https://www.gov.uk/government/collections/how-to-write-and-publish-a-drought-plan#write-your-plan [Accessed November 2018]

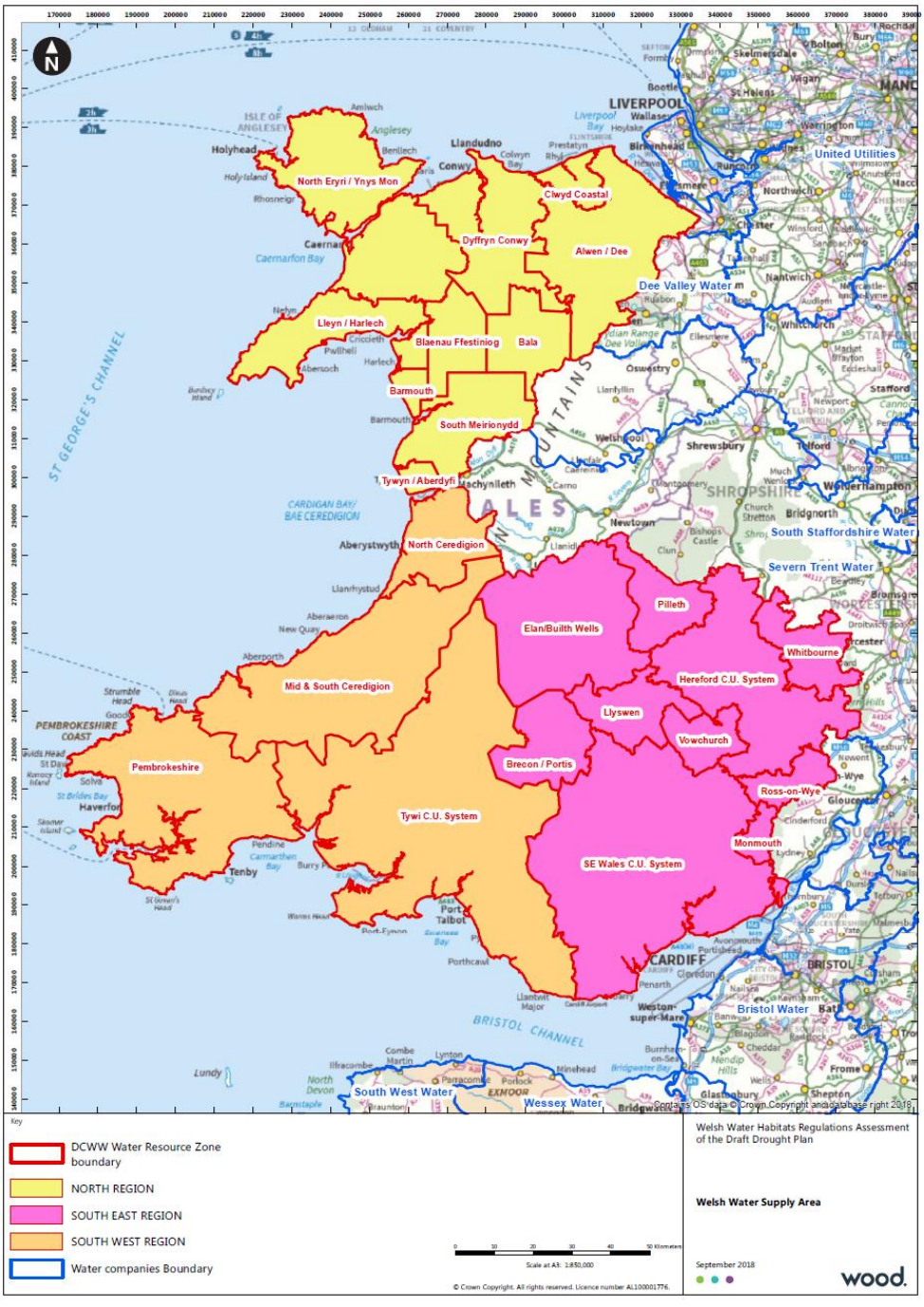
[9] Defra and the Environment Agency (2015) *Drought plans: environmental assessment and monitoring.* Available online: https://www.gov.uk/guidance/drought-plans-environmental-assessment-and-monitoring[Accessed November 2018]

been appropriately accounted for. Following further direction from the Welsh Government, Welsh Water will publish the final Drought Plan and implement it accordingly.

Drought Plan 2020

For operational purposes Welsh Water divides its water supply area into three regions: North Wales, South West Wales and South East Wales. However, for water resource planning purposes these are further subdivide into Water Resource Zones (WRZ). A WRZ is defined as the largest area in which water resources can be shared such that all customers, with some limitations, experience the same risk of water resource failure. **Figure 1.1** shows Welsh Water's 24 WRZs.

Figure 1.1 Welsh Water's Supply Area and Water Resource Zones



Welsh Water has used the Drought Vulnerability Framework[10] (DVF), developed by UKWIR on behalf of the EA and NRW in 2017, to understand the vulnerability of its WRZs to more extreme droughts than it has historically experienced. Using this analysis of drought vulnerability, the first stage of developing the Drought Plan has been to define the hydrological indicators for identifying and measuring the onset of drought in each WRZ. The Drought Plan identifies the following indicators in this regard: rainfall, reservoir storage levels, river flows and levels of demand. Drought triggers have then been developed to identify when specific drought actions to reduce demand and, if necessary, obtain additional water resource may need to be implemented (i.e. when the water resource situation is moving into a drought). These triggers, which are decision making tools as part of an overall drought management framework, are used to categorise a drought into one of five stages in each of the 24 WRZs that make up Welsh Water's area. The stages are shown in **Table 1.1**.

Table 1.1 Welsh Water Drought Stages

Stage	Welsh Water Drought Action Zone
Stage 1	Normal operating conditions
Stage 2	Developing drought
Stage 3	Drought
Stage 4	Severe drought
Stage 5	Emergency Storage

For each stage, there are a range of drought management actions that can be implemented to ensure the continued supply of potable water. These actions are divided into two broad categories; demand-side measures and supply-side measures[11]. Demand-side measures are designed to reduce the demand for water during drought; supply-side measures relate to actions that can temporarily increase the amount of water available for supply during drought. These are detailed in **Table 1.2**.

Table 1.2 Actions Available at the Different Stages of a Drought

Drought Action Zone	Supply Side Actions	Demand Side Actions
Normal	• Weekly monitoring of rainfall, reservoir and river levels. • Optimise sources to minimise the costs of operations whilst remaining within licence, operation and quality constraints	• Daily and weekly monitoring of demand levels and review of supply/demand situation.
Developing Drought	• Targeted leakage management. • Convene 'Gold incident' command centre. • Implementation of dry weather operations to optimise water supply. • Liaison in line with Management and Communication Plan	• Continuous monitoring of demand levels and review of supply/demand situation. • Implement demand side options: ▸ 'Media Campaigns with Water Efficiency Device Offering' ▸ 'Enhanced Leakage Management'

[10] UKWIR (2017) *Drought Vulnerability Framework.* Available online: https://www.ukwir.org/drought-vulnerability-framework-0 [Accessed November 2018]

[11] It should be noted that the terms 'measures' and 'options' are used interchangeably in this report to describe the Drought Plan actions.

Drought Action Zone	Supply Side Actions	Demand Side Actions
Drought	• Continue to optimise current dry weather operational activities to preserve resource. • Review feasibility of bringing mothballed sources back in supply. • If applicable: ▸ Preparation of supply side application for drought order from NRW. ▸ Commence baseline environmental monitoring	• Continuation of preceding actions. • Effectiveness of demand side measures estimated. • Preplanning for the implementation of Temporary Use Bans. • If applicable: ▸ Implement demand side options: ▸ Temporary Use Bans (Saving of up to 5% of demand anticipated).
Severe Drought	• Continuation of preceding actions. • Bring mothballed sources back in supply where feasible. • If applicable: ▸ Implement supply side options.	• Continuation of preceding actions. • Implement demand side options: ▸ Temporary Use Bans (Saving of up to 5% of demand anticipated). ▸ Preplanning for the implementation of Non-Essential Use Bans. ▸ Preplanning for the implementation of Emergency Drought Order. • If applicable, implement demand side options: ▸ Non-Essential Use Bans (Saving of up to 10% of demand anticipated). ▸ Emergency Drought Order (Saving of up to 17.5% of demand anticipated)

The HRA of the Drought Plan has considered the effects of the individual measures identified for each WRZ.

Drought Permits and Drought Orders

Drought Permits and Drought Orders provide three formal mechanisms for addressing drought situations allowed for in the *Water Resources Act 1991*(as amended):

- **Drought Permits** authorise a water undertaker to take water from specified sources. They also enable modification or suspension of restrictions or obligations to which the undertaker is subject relating to the taking of water from existing sources.
- **Drought Orders** are subdivided as follows:
  - **Ordinary Drought Orders** allow water undertakers to prohibit or limit particular uses of water as listed in the *Drought Direction 2011*; they also control discharges to watercourses and abstraction by the water undertaker and parties other than the water undertaker.
  - **Emergency Drought Orders** enable the water undertaker to have complete discretion concerning the uses of water that may be prohibited or limited. They can also be used to authorise the use of stand pipes and water tanks.

It is critical to recognise that Drought Permits and Drought Orders are both legally defined processes that would be subject to HRA at the time of application, if they are likely to affect a European site.

Proposed Demand Management and Supply-side Measures

Through the application of the DVF, Welsh Water has identified 10 WRZs potentially vulnerable to drought risk, and for which a total of 20 supply-side measures are proposed. Additionally, five demand-side measures have been included in the Drought Plan; these measures are not geographically distinct and hence could be implemented in any of the WRZs in Welsh Water's area.

The demand-side and supply-side measures included in the Drought Plan are listed in **Tables 1.3 and 1.4** below.

Table 1.3 Drought Plan Demand-side Measures

Ref	Option	Yield (Ml/d)	WRZ
DM1	Leakage Management	Various	All
DM2	Water Efficiency – customer messaging and device offering	Various	All
DM3	Temporary Use Bans (TUBs)	Various but estimated as 5% saving in demand	All
DM4	Non-Essential Use Bans (NEUBs)	Various but estimated as 5% saving in demand (in addition to DM3)	All
DM5	Extreme measures e.g. pressure management and water rationing	Various	All

Table 1.4 Drought Plan Supply-side Measures

Ref	Option	Yield (Ml/d)	WRZ
8001-2	Removal of Llyn Cwellyn 10 Ml/d abstraction limit	2Ml/d	North Eryri Ynys Mon
8001-3	Reduction of Alaw Compensation Water	1.5Ml/d	North Eryri Ynys Mon
8001-4	Reduction of Ffynnon Llugwy Compensation Water	2.0Ml/d	North Eryri Ynys Mon
8001-5	Reduction of Cefni Reservoir Compensation Water	0.9Ml/d	North Eryri Ynys Mon
8012-2	Reduction of the regulation release from Aled Isaf and modification of the Hands Off Flow value at Bryn Aled	1.0Ml/d	Clwyd Coastal
8012-4	Relaxation of the annual licences on Afon Aled and the Plas Uchaf and Dolwen Reservoirs	5.0Ml/d	Clwyd Coastal
8012-5	Relaxation of the Llannerch boreholes annual licence	1.0Ml/d	Clwyd Coastal
8012-6	Pumped (winter) refill from Aled Isaf to Llyn Aled	N/A*	Clwyd Coastal
8021-1	Tankering raw water from Dysynni	1Ml/d	Tywyn Aberdyfi
8033-2	Reduce compensation water releases from Llyn Bodlyn	1Ml/d	Barmouth
8034-1	Afon Dwyfor Drought Permit	1Ml/d	Lleyn Harlech
8109-1	Reduce compensation water releases from Llwynon Reservoir	9.1Ml/d	SEWCUS** - Llwynon, Sluvad, Court Farm
8112-1	Emergency abstraction from the River Rhondda at Treherbert	1Ml/d	SEWCUS – Rhondda
8116-3	Utilise the Dead Storage in Talybont Reservoir	30 Ml/d	SEWCUS – Talybont
8119-1	Compensation Water Reduction of 50% at Pontsticill Reservoir	9.1Ml/d	SEWCUS - Pontsticill High Level

Ref	Option	Yield (Ml/d)	WRZ
8201-3	Relax the maintained requirement below the Nantgaredig intake on the River Tywi	14 Ml/d	Tywi CUS
8202-1	Increase the Llechryd abstraction from 19 Ml/d to 21 Ml/d and obtain variation of annual licence amounts	2Ml/d	Mid and South Ceredigion
8203-2	Pumped abstraction from Nantymoch (a HEP reservoir operated by Statkraft) into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW	5Ml/d	North Ceredigion
8206-2	Reduce the Compensation release from Preseli Reservoir by 50%	0.91Ml/d	Pembrokeshire
8206-7	Use of freshet bank for public water supply - Llysyfran - (Pembs)	385Ml storage volume	Pembrokeshire

*Option 8012-6 involves a water transfer between reservoirs and will therefore not provide any net gain.
** South East Wales Conjunctive Use System

As a result of the consultation response from NRW to the draft Drought Plan and following further work and discussion, **Table 1.5** details five options that have been removed from further consideration in the Revised Draft Drought Plan in order to ensure that the implementation of the Final Drought Plan avoids any adverse effects on the integrity of European sites. However, DCWW may have to re-consider the use of options 8206-1 and 8206-8 under extreme circumstances that might threaten the availability of public water supply.

Table 1.5 Draft Drought Plan Supply-side Measures not taken forward following Consultation

Ref	Option	Gain in Yield (Ml/d)	WRZ
8109-4	Emergency abstraction from the Afon Lwyd at New Inn	12Ml/d	SEWCUS - Llwynon, Sluvad, Court Farm
8201-1	Reduce Crai compensation flow by 50%	3.4Ml/d	Tywi CUS
8201-4	Reduce Brianne compensation flow by 50%-winter refill only	34Ml/d	Tywi CUS
8206-1	Reduce the required prescribe flow below the Crowhill Abstraction	18Ml/d	Pembrokeshire
8206-8	Relax Canaston Hands-off flow	36.36 Ml/d	Pembrokeshire

The Revised Draft Drought Plan has also identified seven mothballed sources that could be reinstated during a drought. These are identified in **Table 1.6**. Welsh Water has committed to undertaking further assessment work of these mothballed sources before implementation (consistent with a consultation request from NRW) post the finalisation of the Drought Plan 2020.

Table 1.6 Mothballed Sources

Source	WRZ	Source Type
Afon Rhythallt	North Eryri Ynys Mon	River Intake
Grwyne Fawr	South East Wales CUS	Impounding reservoir
Wentwood	South East Wales CUS	Impounding reservoir

Source	WRZ	Source Type
Pant yr Eos & Ynys Fro	South East Wales CUS	Impounding reservoir
Schwyll Well	Tywi CUS	Groundwater Source
Aeron borehole	Mid & South Ceredigion	Groundwater abstraction
Milton Boreholes	Pembrokeshire	Groundwater Abstraction

In accordance with legislation and associated drought plan guidance published by the Welsh Government and NRW, each supply-side measure has been subject to detailed environmental assessment with the findings presented in a series of Environmental Assessment Reports (EARs) that accompany the Revised Draft Drought Plan. The information for drought permits and orders included in a drought plan is to be 'as close' to application ready as possible, especially for those sites that have been identified as causing significant impact to the environment or are most likely to be required in a drought.

1.2 Habitats Regulations Assessment

Regulation 63 of the *Conservation of Habitats and Species Regulations 2017* (the 'Habitats Regulations') states that if a plan or project is "*(a) is likely to have a significant effect on a European site*[12] *or a European offshore marine site*[13] *(either alone or in combination with other plans or projects); and (b) is not directly connected with or necessary to the management of the site*" then the plan-making authority must "*…make an appropriate assessment of the implications for the site in view of that site's conservation objectives*" before the plan is given effect.

The process by which Regulation 63 is met is known as Habitats Regulations Assessment (HRA)[14]. An HRA determines whether there will be any 'likely significant effects' (LSE) on any European site as a result of a 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 site integrity. Welsh Water has a statutory duty to prepare its Drought Plan and is therefore the Competent Authority for any HRA.

Regulation 63 essentially provides a test that the final plan must pass; there is no statutory requirement for HRA to be undertaken on draft plans or similar developmental stages. However, as with Strategic Environmental Assessment (SEA), it is accepted best-practice for the HRA of strategic planning documents to be run as an iterative process alongside plan development, with the emerging options reviewed during development to ensure that potentially significant effects on European sites can be identified at an early stage, to allow the options to be appropriately assessed and / or modified or abandoned (as necessary) to ensure that the subsequently adopted plan is not likely to result in adverse effects on any European sites,

[12] Strictly, 'European sites' are: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agree the site as a 'Site of Community Importance' (SCI); any classified Special Protection Area (SPA); any candidate SAC (cSAC); and (exceptionally) any other site or area that the Commission believes should be considered as an SAC but which has not been identified by the Government. However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') apply; and to possible SACs (pSACs) and listed Ramsar Sites, to which the provisions of the Habitats Regulations are applied a matter of Government policy (TAN5 para. 5.1.3) when considering development proposals that may affect them. "European site" is therefore used in this report in its broadest sense, as an umbrella term for all of the above designated sites. Additional information on European site designations is provided in **Appendix A**.

[13] 'European offshore marine sites' are defined by Regulation 15 of *The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007* (as amended); these regulations cover waters (and hence sites) over 12 nautical miles from the coast.

[14] The term 'Appropriate Assessment' has been historically used to describe the process of assessment; however, the process is now more accurately termed 'Habitats Regulations Assessment' (HRA), with the term 'Appropriate Assessment' limited to the specific stage within the process.

either alone or 'in combination' with other plans. This is undertaken in consultation with NRW, Natural England (NE) and other appropriate consultees.

1.3 This Report

Welsh Water commissioned Wood Environment & Infrastructure Solutions UK Limited (Wood) to undertake the data collection and interpretation required to support an HRA of its draft Drought Plan for the period 2020 – 2025, and to determine whether any aspects of the draft Drought Plan (alone or in combination) could have significant or significant adverse effects on the integrity of any European sites. The draft Drought Plan and accompanying documents including an earlier version of this report were submitted to the Welsh Government with a request for publication. Following receipt of the direction to do so, Welsh Water published the documents for an 8-week consultation, beginning the 25th July 2019. Following consultation and an analysis of the responses, Welsh Water has prepared a Statement of Response to the representations received during the consultation period setting out how and why the draft Drought Plan has or has not been revised to take account of the consultation responses. Welsh Water has amended the draft Drought Plan (the 'Revised Draft Drought Plan') and revised the HRA to reflect these changes. Welsh Water will send the revised documentation to the Welsh Government for confirmation that all representations have been appropriately accounted for.

This report summarises Wood's assessment of Welsh Water's Revised Draft Drought Plan to ensure that it meets the requirements of Regulation 63. The remainder of this report sets out:

- the approach to HRA of the Revised Draft Drought Plan, including the key issues for these strategic plans (Section 2);
- a summary of the options screening (Section 3);
- a summary of the 'appropriate assessments' undertaken for each option where significant effects could not be excluded (Sections 4 – 5);
- an 'in combination' assessment for the plan (Section 6); and
- the conclusion of the HRA of Welsh Water's Revised Draft Drought Plan (Section 7).

2. Approach

2.1 Overview

European Commission guidance[15] suggests a four-stage process for HRA, although not all stages will necessarily be required (see **Box 1**).

Box 1 – Stages of HRA

Stage 1 – Screening

This stage identifies the likely impacts upon a European site of a project or plan, either alone or 'in combination' with other projects or plans, and considers whether these impacts are likely to be significant. The screening test is a 'low bar' test and mitigation measures should not be considered at this point.

Stage 2 – Appropriate Assessment

Where there are likely significant effects, or where this is uncertain, this stage considers the effects of the plan or project on the integrity of the relevant European Sites, either alone or 'in combination' with other projects or plans, with respect to the sites' structure and function and their conservation objectives. Where it cannot be concluded that there will be no adverse effects on sites' integrity, it is necessary to consider potential mitigation for these effects. If mitigation is not available then the assessment may need to proceed Stage 3.

Stage 3 – Assessment of Alternative Solutions

Where adverse effects remain after the inclusion of mitigation, this stage examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of European sites.

Stage 4 – Assessment Where No Alternative Solutions Exist and Where Adverse Impacts Remain

This stage assesses compensatory measures where it is deemed that there are no alternatives that have no or lesser adverse effects on European sites, and the project or plan should proceed for imperative reasons of overriding public interest (IROPI). The EC guidance does not deal with the assessment of IROPI.

The 'screening' test or 'test of significance' is a low bar, intended as a trigger rather than a threshold test: a plan should be considered 'likely' to have an effect if the competent authority (in this case Welsh Water) is unable (on the basis of objective information) to exclude the possibility that the plan could have significant effects on any European site, either alone or in combination with other plans or projects; an effect will be 'significant' simply if it could undermine the site's conservation objectives.

An 'appropriate assessment' stage (if required) allows for a closer examination of the plan (or its components, i.e. the options) where the effects are significant or uncertain[16] to determine whether there will be any 'adverse effects on integrity' of any European sites as a result of the plan's implementation. The scope of any 'appropriate assessment' stage is not set, however, and such assessments need not be extremely detailed: they must simply be 'appropriate' to the effects and proposal being considered, and sufficient to ensure that there is no reasonable doubt that adverse effects on site integrity will not occur.

It should be noted that the recent "People Over Wind" judgement[17] has altered how mitigation and avoidance measures are accounted for in an HRA (see **Section 2.3** below). The judgement states that "*…it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects [mitigation] of the plan or project on that site*". This contrasts with established practice in this area (based on the "Dilly Lane" judgment[18]) whereby avoidance and mitigation measures were typically

[15] *Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC 2002).
[16] i.e. 'likely significant effects', where the possibility of significant effects cannot be excluded.
[17] Court of Justice of the European Union (ECJ) Case C-323/17 - People over Wind, Peter Sweetman v Coillte Teoranta, preliminary ruling.
[18] Hart District Council v Secretary of State for Communities and Local Government [2008] EWHC 1204

considered at screening. This presents some challenges for plan-level HRA, and in practice many more HRAs will now require an 'appropriate assessment' stage; however, this should not substantially increase the workload required to complete an HRA for a plan or plan component that would have previously been subject to screening only – as noted, any such assessment must simply be 'appropriate' to the issues being considered.

The approach summarised in **Box 1** works well at the project-level where the scheme design is usually established and possible effects on European sites can be assessed (usually quantitatively) using a stepwise process and detailed scheme-specific data. In contrast, the fundamental nature of the Drought Plan presents a number of distinct challenges for a 'strategic' HRA and it is therefore important to understand how the Drought Plan is developed, how it would operate in practice, and hence how it might consequently affect European sites. In particular, there is a potential conflict between the specific nature of the options; the requirement that the options (and hence the plan) have 'no likely significant effects (LSE)' or 'no adverse effects'; the level of certainty that can be established at the strategic level; and the desirability of not excluding every potential solution which cannot be conclusively investigated within the Drought Plan development timescales.

2.2 Understanding the operation of the Drought Plan

Drought Plan stages and potential Drought Plan measures

Five stages (as set out in **Table 1.1**) are used to categorise a drought, depending on different drought triggers, with different drought management actions proposed reflecting the stage and severity of the drought. As set out in **Tables 1.3** and **1.4**, these include '**demand side**' measures such as water efficiency or leakage reduction, or '**supply side**' measures such as making use of 'spare' water that is available under existing licences, or temporarily modifying licences to increase the water available by increasing abstraction or reducing compensation releases.

Demand side measures

The '**demand side**' measures are not geographically specific (water efficiency measures and leakage reduction programmes will occur across all WRZs) and are simply an escalation of the normal baseline programmes of water efficiency and leakage reduction that Welsh Water operates at all times. At times of drought, there would be a step-change in the intensity and spatial application of water efficiency and leakage reduction activity across the WRZs. However, it is not possible to predict (at the strategic level) specific locations where these measures might be applied as location-specific information on the measures is not available without specific investigations, which would form part of the package (for example, the location and severity of most leakages is not known).

Supply side option characteristics

The Drought Plan supply side options have a number of characteristics that must be taken into account by the HRA:

- Most of the supply side options are **geographically distinct**. For example, there are many measures across the WRZs relating to reducing compensation releases from reservoirs; however, the impacts of each measure could be very different depending on their location and proximity to nationally and internationally designated sites of conservation importance.
- All draft supply side options are intended to be relatively **short–term in nature**. They are designed to be implemented to meet short-term need for the duration of a drought (typically 3-4 months). Where additional infrastructure is put in place, it tends to be temporary in nature such as over-ground pipelines and mobile water treatment works.

- All the draft supply side options are **equally feasible.** The term 'options' may suggest that it is possible to choose or discard certain options. However, implementation would be determined by the nature of the drought and operational requirements at the time, and therefore any of the options could potentially be implemented.
- Although equally feasible, some of the measures are **mutually exclusive**. Not all options could be implemented in combination.
- It should be noted that the locations of temporary works required to implement a supply-side option cannot always be reliably established at the strategic Drought Plan level, since they will be subject to the outcome of negotiations with landowners as well as scheme-level environmental assessments. However, most temporary works are likely to be located within or near existing Welsh Water assets, and these have been used as the basis for identifying European sites that may be affected by construction effects. The routes of temporary pipelines (etc.) obviously cannot be determined at this stage, although in these instances, the 'to' and 'from' asset locations were identified and a broad study area used to identify any European sites that might reasonably be affected by a route between these locations.

The HRA must consider and assess the specific measures within the Drought Plan appropriately, whilst recognising (and mitigating) the inherent uncertainties within those measures (i.e. the absence of some detailed scheme design or parameters) and within the plan itself (i.e. so that the Drought Plan, as a whole, is compliant with the Habitats Regulations even if some residual uncertainty persists with some measures).

As noted in Section 1.1, the Revised Draft Drought Plan also proposes the use of **mothballed sources** which could be brought back into service at short notice; the use of these sources would not require a drought permit or drought order and so are not specific 'options' within the Revised Draft Drought Plan. Welsh Water has committed to undertaking further assessment work of these mothballed sources before implementation (consistent with a consultation request from NRW).

Environmental Assessment Reports and Monitoring Plans

Environmental Assessment

NRW guidance[19] on the preparation of a drought plan states "*For each supply-side drought management action, you must include an environmental assessment of the impacts that your planned actions will have on the environment. Your environmental assessment should:*

- *establish the baseline;*
- *identify the likely changes in hydrology, hydrogeology and geomorphology, due to implementing the action;*
- *identify the features that are sensitive to these changes;*
- *identify the likely impacts on sensitive features include any additional evidence/data requirements;*
- *identify any mitigation or compensation measures required to lessen the impact of your actions on these features;*
- *identify any impacts your actions may have on other existing water users*."

[19] Natural Resources Wales (2017) *Water Company Drought Plan Technical Guidance*. Available online: https://cdn.naturalresources.wales/media/684414/final-wc-drought-plan-guidance-2017.pdf?mode=pad&rnd=131656713580000000

Welsh Water has prepared 20 Environmental Assessment Reports (EARs) in support of the Revised Draft Drought Plan. The EARs are substantial reports that describe the environmental impact of drought measures. They are required to support applications for a Drought Permit or Drought Order. Each EAR is prepared as a 'shelf-copy' report which would be updated in the event that Welsh Water needs to make an application during any future drought to NRW for a Drought Permit or Drought Order. This is to ensure that their preparation does not delay the application process.

Each EAR contains:

- an assessment of the likely changes in river flow / water level regime due to implementing the proposed measure;
- identification of the environmental features that are sensitive to these changes and an assessment of the likely impacts on these features;
- identification of mitigation measures that may be required to prevent or reduce impacts on sensitive features; and
- recommendations for baseline, in-drought and post-drought order monitoring requirements.

The EARs provide the principal assessments and/or data sources relating to the operation of the options and their hydrological effects on European site, and so form the basis for the assessments contained in the HRA of the Revised Draft Drought Plan. The EARs will (if employed in a drought) then form the basis of any HRA required of the Drought Permit or Drought Order. It should be noted that EARs have their own terminology when assessing the significance of effects; in particular, the use of the phrase 'adverse effect' in an EAR does not equate to 'adverse effects on integrity' in HRA terms.

Environmental Monitoring Plans

The NRW guidance states that an environmental monitoring plan (EMPs) should be completed for each supply-side drought actions. The EMP should set out:

- how the new monitoring data will be used to address gaps in understanding of:
  - the environmental sensitivity of a site and any damage the proposed measure may cause;
  - the normal (baseline) conditions at a site;
  - the recovery of the environment after drought;
  - how the impacts of the measures will be assessed during and after a drought;
  - how the data will be used to review and refine drought triggers and mitigation measures (if relevant).
- the feature(s) to be monitored and the methods used;
- the location of survey sites;
- the timing and frequency of monitoring; and
- who will undertake the monitoring.

2.3 HRA of the Drought Plan

Overview

HRAs of plans and strategies typically have to deal with a degree of uncertainty; very often, it is not possible to provide a detailed assessment of the effects of a proposal (be it an allocation, or policy, or scheme) as many aspects of the proposal simply cannot be fully defined at the strategy-level in the planning hierarchy. Where the available information is fundamentally insufficient to complete a meaningful appropriate assessment, then this assessment may be deferred 'down the line' to a lower planning tier provided that certain criteria are met; however, this is usually only appropriate where there is sufficient certainty that the proposal can, with the implementation of established scheme-level measures that are known to be effective, avoid adverse effects on the integrity of European sites. In other instances, the appropriate assessment is completed as far as possible at the plan-level, and any residual uncertainty is addressed by including various controls (e.g. policy caveats or commitments to specific avoidance or mitigation measures) that help provide certainty over future outcomes.

As noted, this approach is more difficult to apply to drought plans, as it essentially comprises a series of specific options or schemes designed to be implemented under specific scenarios, for which a reasonable amount of information is available. Furthermore, the nature of the implementation of the Drought Order or Drought Permit (probably with limited notice, and with limited flexibility to deviate from the proposals set out at the Drought Plan level) ensures that there may not be sufficient time to undertake a suitably robust assessment before the options are employed, creating further residual risks. Furthermore, it is not generally considered appropriate to include schemes within a plan that would not be deliverable at the project-stage without adverse effects on a European site.

As a result, Welsh Water has adopted an approach whereby the EARs and the information required for associated 'scheme level' HRAs are completed as far as possible prior to the adoption of the Drought Plan (i.e. substantially in advance of any Drought Order or Drought Permit application), with clear pathways identified for the collection of any outstanding data required to inform these assessments prior to application. This approach therefore aims to resolve as many uncertainties as possible at the Drought Plan level. However, it is important to note that some uncertainties will remain (particularly with regard to 'in combination' effects) and for some options it will only be possible to fully assess any potential effects at the pre-project planning stage or permit/order application stage, when certain specific details are known; for example: construction techniques; site specific survey information; details of the type and scale of the drought; the precise timing of implementation; or the status of other projects that may operate 'in combination'. In addition, it may be several years before an option is employed, during which time other factors may alter the baseline or the likely effects of the option.

It must also be noted that at times of drought the water environment is already under stress. The measures within Welsh Water's Drought Plan have the potential to create additional environmental effects; for example, some options will enable additional water to be abstracted from designated watercourses such as the Afon Cleddau, which may already be under pressure as a result of the drought conditions. However, the HRA must focus on assessing the additional effects of the Drought Plan measures on European sites, since the HRA is an assessment of the Drought Plan and not the wider effects of a drought. It is therefore important to differentiate between the impacts that occur 'naturally' during a drought (i.e. without Drought Plan interventions) and those impacts that might occur directly as a result of the Drought Plan being implemented. Furthermore, the circumstances of every drought will be different, and therefore the exact options used, and how those options will affect specific European sites, will also be different. Thus, there is a considerable amount of inherent uncertainty within the Drought Plan, much of which cannot necessarily be resolved until the circumstances of the drought are known.

Use of EARs in HRA of the Drought Plan

EARs have been completed for all proposed Revised Draft Drought Plan options and these documents provide detailed assessments of the likely hydrological effects of each option, and hence likely impacts on various receptors (including European sites). Where European sites are exposed to the likely hydrological effects of an option, the EAR includes the information required for a 'screening' of the option. Where significant effects cannot be excluded, a separate 'appropriate assessment' is produced. The EARs and associated documents therefore provide a comprehensive technical assessment of the likely effects of each option.

The HRA of the Revised Draft Drought Plan is necessarily a plan-focused assessment, dealing with Welsh Water's obligations for the Drought Plan under Regulation 63 of the Habitats Regulations. Due to the nature of the Drought Plan, it must rely heavily on the assessments within the EARs and associated reports to ensure that it is suitably robust; the plan-level HRA is therefore intended to complement the EARs and associated reports, and it does not therefore replicate information that is available within these reports except where a summary of the assessment is appropriate. However, the plan-level HRA does provide a slightly broader context for the assessment than the EARs as it provides explicit consideration of construction effects (although these are few); and a broader 'in combination' assessment.

Assessment Approach and Principles

Scope and Data Collection

The HRA of the Revised Draft Drought Plan considers all European sites within 20km of the location of any operational facilities or infrastructure required to deliver each option (including temporary infrastructure), plus any additional sites that might be hydrologically connected to the operational zone of influence. This takes into account terrestrial mobile species and their typical ranges, and is considered to be a suitably precautionary approach[20] for the Drought Plan. Sites over 20km from the operational facilities (or which are not hydrologically linked) are considered sufficiently remote that any environmental changes will be effectively nil, and so there will be 'no effects' on sites beyond this distance (and so no possibility of 'in combination' effects). Wide-ranging marine / marine dependent species associated with marine sites that are not directly connected to the hydrological zone of influence are not considered to be both sensitive and exposed to the effects of the drought options, and are not explicitly considered. The European sites and interest features considered potentially exposed to the outcomes of the Drought Plan are listed in **Appendix B**.

Data on the European sites noted in **Appendix B**, such as site interest features, site locations, conservation objectives and condition assessments, were collected from the Joint Nature Conservation Committee (JNCC), NRW and NE websites. These data were used to determine the condition, vulnerabilities and sensitivities of the sites and their interest features and determine the approximate locations of the interest features within each site (if reported).

Available information on the Revised Draft Drought Plan options was provided by Welsh Water and the EARs. These provide descriptions of each option, including the likely outcomes (design yields/capacities), the scheme requirements, the type and indicative location of any temporary works and an outline of how the option would function. Further information on general water resources was obtained from Welsh Water

[20] 'Arbitrary' buffers are not generally appropriate for HRA. However, as distance is a strong determinant of the scale and likelihood of effects the considered use of a suitably precautionary search area as a starting point for the screening (based on a thorough understanding of both the options and European site interest features) has some important advantages. Using buffers allows the systematic identification of European sites using GIS, so minimising the risk of sites or features being overlooked, and also ensures that sites where there are no reasonable impact pathways can be quickly and transparently excluded from any further screening or assessment. When assessing multiple options it also has the significant advantage of providing a consistent point of reference for consultees following the assessment process, and the 'screening' can therefore focus on the assessment of effects, rather than on explaining why certain sites may or may not have been considered in relation to a particular option.

(groundwater (GW) and surface water (SW) abstraction locations, source operational parameters, WRZ operation, emergency or drought plan operations) and NRW (Welsh Water and other GW/ SW abstractions, CAMS documentation). These data are the best-available data on the operation of each option and its likely outcomes and effects. It should be noted that the location of any temporary enabling works cannot always be established at the strategic Drought Plan level: whilst some elements are self-evident (for example, most temporary water treatment works (WTWs) will be located within existing Welsh Water assets), the exact routes of temporary pipelines (etc.) cannot be determined at this stage. In these instances, the 'to' and 'from' locations were identified and a broad study area used to identify any European sites that might be affected by a route between these locations.

Screening and 'People over Wind'

The 'screening' test or 'test of significance' is treated as a low bar: in general, unless the possibility of significant effects can be simply and self-evidently excluded (using, *inter alia*, information available in the EARs) then a more detailed 'appropriate assessment' is completed.

The 'low bar' approach is reinforced by recent case law known as 'People Over Wind'[21], which has altered how avoidance and mitigation measures are accounted for by the HRA. There is currently little information on the practical implementation of the 'People over Wind' judgement, particularly for strategy-level HRA, although broad guidance has been issued by the Planning Inspectorate (PINS)[22]. In previous drought plan rounds, HRAs of drought plans typically assumed that established best-practice avoidance and mitigation measures (see **Appendix D**) would be employed at the project level throughout scheme design and construction to safeguard environmental receptors, including European site interest features, and accounted for this at the screening stage. However, it is arguable that an assumption such as this, albeit in relation to a lower-tier project that would itself be subject to HRA, might constitute an 'avoidance measure' that the drought plan is effectively relying on to ensure that significant effects do not occur.

In this instance, therefore, mitigation measures (including the established best-practice avoidance and mitigation measures noted in **Appendix D**) are not taken into account at screening, but are instead introduced at the 'appropriate assessment' stage (if required).

The screening has identified and assessed possible effects on European sites based on:

- the anticipated operation of each option and predicted hydrological zone of influence (based on the EARs);
- any predicted enabling works required for each option;
- the European site interest features and their vulnerabilities;
- the presence of reasonable impact pathways.

The screening therefore identified the following:

- those European sites where significant effects were considered likely as the result of an option;
- those European sites where significant effects were considered uncertain as the result of an option;
- those European sites where significant effects were considered unlikely (alone) as the result of an option (but where in combination effects might still be possible); and

[21] Case C 323/17 Court of Justice of the European Union: People Over Wind
[22] PINS Note 05/2018: *Consideration of avoidance and reduction measures in Habitats Regulations Assessment: People over Wind, Peter Sweetman v Coillte Teoranta*.

- those options that will have no effects on any European sites due to their nature or location (and hence no possibility of 'in combination' effects).

Potential hydrological effects were categorised by reference to the EARs, which set out the predicted zone of hydrological influence for some options and categorises effects as 'negligible', 'minor', 'moderate' or 'major'. Where effects were categorised as 'negligible', or a European site is outside the predicted zone of influence, then the option is considered to have 'no likely significant effect'. Where hydrological effects are classified as 'minor', 'moderate' or 'major' it is assumed that the option will have a significant effect on any coincident European sites, unless there are other factors that would over-ride this (e.g. the interest features are not exposed or sensitive to the likely hydrological effects).

Appropriate Assessment

The 'appropriate assessments' are an extension of the assessment processes undertaken at the screening stage, with significant effects examined to determine whether there will be any adverse effects on the integrity of any European sites. The appropriate assessment sections in this HRA document summarise the appropriate assessments completed for each individual option alongside the EARs. It is important to note that the EARs have their own terminology that is distinct from that applied during an HRA; so, for example, hydrological effects may be classified in the EARs as 'minor adverse', 'moderate adverse' or 'major adverse' although the use of 'adverse' in this context does not necessarily equal 'adverse effects on integrity' in HRA terms. The option-specific appropriate assessments that accompany the EARs therefore interpret the effects on integrity based on the conservation objectives.

It should be noted that the judgement of the court in Case C-258/11 (Sweetman v An Bord Pleanála and others) states that that "*a plan or project…will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of SCIs, in accordance with the directive. The precautionary principle should be applied for the purposes of that appraisal*". This would suggest that 'temporary effects' are less likely to be considered 'adverse', which has some relevance for the Drought Plan.

In combination assessment

HRA requires that the effects of other projects, plans or programmes be considered for effects on European sites 'in combination' with the Revised Draft Drought Plan. There is limited guidance on the precise scope of 'in combination' assessments for strategies, particularly with respect to the levels within the planning hierarchy at which 'in combination' effects should be considered. The 'two-tier' nature of the Revised Draft Drought Plan (i.e. a strategy with specific schemes) also complicates this assessment.

Broadly, it is considered that the Revised Draft Drought Plan could have the following in combination effects:

- within-plan effects - i.e. separate options affecting the same site(s);
- between-plan abstraction effects - i.e. effects with other abstractions, in association with or driven by other plans (for example, the water resources management plans (WRMPs) or other water company Drought Plans);
- other between-plan effects - i.e. 'in combination' with non-abstraction activities promoted by other plans - for example, with flood risk management plans.

In undertaking the 'in combination' assessment it is critical to note that:

- the Review of Consents (RoC) process has completed an 'in combination' assessment for all currently licensed abstractions (and many unlicensed abstractions);

- the RoC underpins (and drives) the WRMP, which explicitly accounts for land-use plans and growth forecasts when calculating future water demand (and hence areas with potential deficits);
- the Revised Draft Drought Plan is developed with direct reference to the WRMP and its associated calculations (and so implicitly accounts for land-use plans and growth forecasts when calculating potential deficits).

This means that 'in combination' water-resource effects with other known plans or projects are explicitly or implicitly considered and accounted for during the Drought Plan development process. It is therefore considered that (for the HRA) potential 'in combination' effects in respect of water-resource demands associated with other plans or projects are generally unlikely since these demands are considered when developing the Drought Plan and its associated plans. It should also be noted that the detailed examination of non-Welsh Water abstraction or discharge consents for 'in combination' effects can only be undertaken by NRW through any HRA required at the Drought Permit or Drought Order stage. The assessment of in combination effects therefore aims to identify a theoretical 'worst case' from a Welsh Water perspective (i.e. all options potentially affecting a site operating concurrently, although this is extremely unlikely) and has also included, as far as possible, an assessment of potential effects with other water company drought plans and options.

3. Option Screening

3.1 Screening Summary

Demand-side options

It is not possible to predict (at the strategic level) specific locations where demand-side measures might be applied, and hence effects on specific European sites cannot be identified although a small residual risk remains. Much of this risk can be avoided with established scheme-level mitigation measures and it is very unlikely that a particular demand-side measure would be unavoidable; however, these options are carried forward to the 'appropriate assessment' stage for procedural reasons and to avoid potential conflict with the 'People over Wind' case.

Supply-side options

The 'alone' screening assessments for each option are set out in **Appendix C** and summarised in **Table 3.2** below. In summary, the assessment aims to identify those European site features that are potentially vulnerable to a particular option – i.e. both exposed and sensitive to the likely outcomes (see **Table 3.1**). Features that are both exposed and sensitive to an environmental change are assumed to be subject to 'likely significant effects' unless there is a clear over-riding reason why significant effects cannot occur.

Table 3.1 Summary of screening criteria used in Appendix C

Vulnerable?	Notes
0	Sites or features that are not exposed to the effects of an option via any reasonable impact pathways and so there will be 'no effect' (hence no risk of 'in combination' effects)
No (N)	Sites or features that are potentially exposed and sensitive to the predicted environmental changes, but where effects are not considered significant (alone) due to their scale, nature etc. based on the information within the EARs and other contextual assessment information.
Uncertain (U)	Sites or features where a potential effect is clear and identifiable, which cannot be self-evidently excluded and which require additional consideration through 'appropriate assessment' (including options relying on mitigation to ensure significant effects do not occur).
Yes (Y)	Sites or features where significant effects are very likely or certain due to the scale/nature of the option proposals, or the vulnerability and distribution of the interest features on the European site. Adverse effects may be more likely and there is more certainty that (at scheme level) the option would have to rely on specific mitigation or compensation rather than general / simple environmental avoidance measures.

Table 3.2 Supply side options screening summary (see also Appendix C)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8001-2	**Removal of Llyn Cwellyn 10 Ml/d abstraction limit**	The drought order involves the relaxation of the low lake level abstraction rate at Llyn Cwellyn. When lake levels have fallen below 0.8m below spillway and the daily abstraction rate has reduced to 10Ml/d in the current licence conditions, the drought option proposes to operate the abstraction at a daily rate of 12Ml/d. The lake level at which abstraction ceases would be maintained as per the current licence conditions of 2.6m below spillway during the period 16 September to 15 November and 2.0m below spillway at all other times. Compensation releases would be maintained as per the current licence conditions of 11.4Ml/d when lake level is between 0.8m and 2.6m below spillway. Freshet releases would not be impacted by the drought option. The drought order may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to May to October, as confirmed by water resources modelling carried out by Welsh Water.	The **Afon Gwyrfai a Llyn Cwellyn SAC** will be directly affected by the scheme, although these effects will be negligible. The operation of the scheme will maintain compensation releases to the Afon Gwyrfai and freshet releases would not be impacted. The maintenance of the compensation release will ensure that that the Afon Gwyrfai is protected during any drought period and the interest features of the lake (**Oligotrophic to mesotrophic standing waters;** and **Floating Water Plantain**) are likely to be reasonably resilient to fluctuating levels, particularly given the normal range of lake levels due to abstraction, and the overall depth of the lake. The scheme would result in a small additional drawdown of the lake (~1%) but this is not considered significant.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8001-3	**Reduction of Alaw Compensation Water**	The drought permit involves a proposed reduction in the statutory compensation release from Alaw Reservoir to the Afon Alaw of 1.5Ml/d, from 3.2Ml/d to 1.7Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The drought permit scheme will influence the downstream Afon Alaw from the outflow at Alaw Reservoir to the tidal limit. Drought permits may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought permit will be restricted to July to December, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The operation of the scheme will influence the Afon Alaw from the outflow at Alaw Reservoir to the tidal limit at Llanfachraeth, which marks the boundary with the **Anglesey Terns / Morwenoliaid Ynys Môn SPA**. The Afon Alaw ultimately drains to Beddmanach Bay, which is partly covered by the **North Anglesey Marine / Gogledd Môn Forol SCI**. The hydrological impacts will end at the tidal limit (i.e. where the **Anglesey Terns / Morwenoliaid Ynys Môn SPA** begins); very localised short-term effects on water-resource sensitive habitat features within the estuary are conceivable, although in practice the small-scale of any changes and the extremely limited exposure and sensitivity of the interest features (tern species) will ensure that effects are 'not significant' alone.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8001-4	**Reduction of Ffynnon Llugwy Compensation Water**	The drought permit involves a proposed reduction in the compensation flow release from Ffynnon Llugwy to the Afon Llugwy from 4.5Ml/d to 2.5Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The drought permit will influence the downstream Afon Llugwy as far as the Llyn Cowlyd stream capture leat, and potentially further downstream depending on the abstraction and compensation arrangements at the leat. The drought permit may remain in force for a period of up to six months, and it can be extended for up to a further six months. However, the period of implementation for this drought permit will be restricted to July to December, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. This will affect the Afon Llugwy for approximately 1.5 km (as far as the Llyn Cowlyd stream capture leat, and potentially further downstream depending on the abstraction and compensation arrangements at the leat). No additional infrastructure would be required to enable this option to be implemented. The scheme will affect the Ffynnon Llugwy reservoir although this will largely be neutral or positive as water levels will be maintained for longer that if the Drought Plan were not in operation; the limnal features of the **Eryri SAC** are not thought to be present in this lake, based on the Management Plan, but would not be adversely affected if present. The Afon Llugwy will be affected by the operation of the scheme and is partially within the SAC, although none of the SAC interest features are dependent on maintenance of flows within the river, and so significant effects would not occur. The ultimate downstream receptor for this option is the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC, to which the Afon Llugwy flows via the Afon Conwy; however, the operation of the option will have negligible hydrological effects beyond Capel Curig, and any changes would be effectively undetectable at the SAC; on this basis, as effects at the SAC will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8001-5	**Reduction of Cefni Reservoir Compensation Water**	The drought permit involves a proposed reduction in the statutory compensation release from Cefni Reservoir to the Afon Cefni of 0.9Ml/d, from 1.8Ml/d to 0.9Ml/d. Drought permits may remain in force for a period of up to six months, and they can be extended for up to a further six months. The period of implementation for this drought permit will be restricted to July to December, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The scheme will influence the downstream Afon Cefni from the outflow at Cefni Reservoir to the tidal limit, and may affect effluent dilution from Llangefni WTW which discharges into the Afon Cefni approximately 4 km downstream of the compensation discharge point. The option would make use of existing infrastructure and would not require construction of new infrastructure. The ultimate downstream receptor for this option is the **Anglesey Terns / Morwenoliaid Ynys Môn SPA**, which covers the estuary of the Afon Cefni, and the **Glannau Môn: Cors heli / Anglesey Coast: Saltmarsh SAC** (boundary of all sites at Pont Malltraeth). However, the operation of the option will only affect the Afon Cefni to the tidal limit (at Pont Bulkeley, approximately 6.5km upstream of Pont Malltraeth) and hydrological changes would be effectively nil at the site boundaries; in addition, the features of these sites will not be particularly sensitive or exposed to any effects. On this basis no significant effects will occur. In addition, as effects at the SAC / SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8012-2	**Reduction of the regulation release from Aled Isaf and modification of the Hands Off Flow value at Bryn Aled**	The drought permit involves a proposed reduction of 2Ml/d in the regulation release rate from Aled Isaf Reservoir whenever abstraction is taking place and residual flow at Bryn Aled is below 29.5Ml/d. This would conserve the longevity of total reservoir storage for regulation releases to the Afon Aled for abstraction at the Bryn Aled intake. Drought actions and any future application for a drought permit would be managed by the Aled and Clwyd Consultative Group which would be convened under the terms of the Section 20 Operating Agreement with NRW. Drought permits can be granted for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to September to January, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The gain in supply will be made by slowing the drawdown of the Aled Reservoirs, enabling the regulation release to be sustained for longer. There would be no adverse impact in the upper reaches of the Afon Aled as the combined regulation and compensation releases would still be in excess of the normal full compensation release. The environmental impact would be to reduce the flows in the Afon Aled below the Bryn Aled abstraction point. The option would not require construction of new infrastructure. The ultimate downstream receptor for this option is the **Liverpool Bay / Bae Lerpwl SPA**, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be essentially undetectable at the site boundary; in addition, the features of this site will not be particularly sensitive or exposed to any effects associated with changes in freshwater flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8012-4	**Relaxation of the annual licences on Afon Aled and the Plas Uchaf and Dolwen Reservoirs**	The drought permit involves a relaxing the annual licence conditions on the Bryn Alde intake and Plas Uchaf and Dowlen Reservoir abstraction, to enable Welsh Water to abstract from the Aled catchment at high demands of up to the daily licensed maximum rates, to meet higher than usual demands in drought conditions. Drought permits can be granted for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to November to March, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The ultimate downstream receptor for this option is the **Liverpool Bay / Bae Lerpwl SPA**, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be undetectable at the site boundary; in addition, the features of this sites will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8012-5	**Relaxation of the Llannerch boreholes annual licence**	The drought permit involves a change in the abstraction licence at Llannerch through a temporary cessation of the annual abstraction rate condition. The maximum daily abstraction rate of 13.64Ml/d would still be applicable. The average daily abstraction that would be permissible within 12 months would be raised by 4.3Ml/d from 9.34Ml/d to 13.64Ml/d. This would provide a modest increase in water resource during a drought and increase the security of supply in the Clwyd Coastal WRZ by assisting post-drought winter refill of the Aled Reservoirs, by reducing demand from that resource. Drought permits may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought permit will be restricted to September to January, as confirmed by water resources modelling carried out by Welsh Water.	The Llanerch boreholes are adjacent to the River Clwyd, which flows to the **Liverpool Bay / Bae Lerpwl SPA** at Rhyl. The operation of the proposed drought permit will affect local groundwater levels, thus influencing the Afon Clwyd and other watercourses in connectivity through the superficial deposits by reduction of baseflow. However, the drought permit would not alter the licence conditions under which the Clwyd Augmentation Scheme operates and the option will have negligible hydrological effects at the boundary of the SPA. In addition, the features of this site will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Clwyd. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8012-6	**Pumped (winter) refill from Aled Isaf to Llyn Aled**	Under the drought permit water from Aled Isaf Reservoir would be pumped up to Llyn Aled Reservoir to support refill. Such usage is not authorised by the existing abstraction licence and a drought permit would be required. Daily pumping rates have not been specified at this stage and so the assessment is based on an assumed transfer rate of 19.5Ml/d. Drought actions and any future application for a drought permit would be managed by the Aled Consultative Group which would be convened under the terms of the Section 20 Operating Agreement with NRW. The drought permit will be restricted to the autumn and winter period between November to February. This has been confirmed by Welsh Water's water resources modelling and understanding of operating the assets.	This option is linked to Option 8012-4, where the dead storage in Llyn Aled is accessed. Llyn Aled has a small catchment so would take an extended period of time to refill;this option utilises the more rapid refill of Aled Isaf to support the refill of Llyn Aled through pumping of water from Aled Isaf back up to Llyn Aled. It is assumed however that temporary pumping equipment and overground pipeline will be required to actively transfer water storage against the topographic gradient for approximately 1km from Aled Isaf to Llyn Aled. The ultimate downstream receptor for this option is the **Liverpool Bay / Bae Lerpwl SPA**, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be undetectable at the site boundary; in addition, the features of this sites will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans. Construction of the scheme will not affect any European sites or features.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8021-1	**Tankering raw water from Dysynni**	The proposed drought permit would involve a daily abstraction of up to 1Ml/d from a temporary river abstraction intake located upstream of the Pont y Garth gauging station on the Afon Dysynni. The temporary intake is likely to be at a Natural Resources Wales Depot (NGR: SH635070). Appropriate screening for eels and salmonids will be provided at the abstraction intake which complies with the Eels (England and Wales) Regulations 2009. Suitable additional hardstanding for tankers would be provided at the selected location if required and the water abstracted would be transferred by tanker to the water treatment works at Penybont.	The Afon Dysynni ultimately flows to the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC**; however, operational effects will not occur as the hydrological effects are predicted to be negligible beyond the confluence of the Dysynni with the Afon Fathew, which is just above the tidal limit and approximately 4.3km upstream of the SAC boundary. A temporary abstraction of 1Ml/d from the Afon Dysynni at the NRW depot would represent a 1% reduction in summer low flows and a 1.7% reduction in summer extreme low flows. The hydrological impact of this drought permit option is therefore considered to be negligible. Construction requirements are uncertain but will be very localised and minor and there is no possibility of these works affecting either the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC** (distance, natural attenuation) or the features of the **Craig yr Aderyn (Bird`s Rock) SPA** (chough are generally tolerant of activities away from their nests and foraging areas, and any construction would be over 600m from the edge of the SPA). Therefore, significant effects will not occur.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8033-2	**Reduce compensation water releases from Llyn Bodlyn**	The drought order involves a proposed reduction in the statutory compensation flow release from Llyn Bodlyn to the Afon Ysgethin by 1 Ml/d, from 2.18 Ml/d to 1.18 Ml/d. This will conserve reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The option will potentially influence the downstream Afon Ysgethin. The reduction in the compensation release will be restricted to July to October. This is based on modelling of the Llyn Bodlyn performance under normal operating conditions in dry summers, together with experience of operating the source. No new infrastructure would be required for this option.	The option will reduce flows in the Afon Ysgethin to its tidal limit west of Tal-y-Bont. The Ysgethin flows to the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC** via the Coed Cors-y-Gedol unit of the **Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC**, and so both of these sites are potentially exposed to the hydrological changes associated with the option. However, the hydrological effects of the scheme on the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC** are considered negligible (whilst Q_{95} flows will be reduced by up to 16.7% in Reach 2, this is the maximum reduction expected at the top end of the reach (i.e. near Pont Fadog); the percentage reduction in flows will be substantially less at the mouth of the Afon Ysgethin due to flow accretion from a number of additional streams along the reach). As the features of the SAC are almost exclusively marine (with the exception of **Otter**), their sensitivity to the minor variations in	Construction: No - no construction required	Operation: Uncertain - effect pathway present but effects likely to be minimal; appropriate assessment likely to confirm effects will not be significant.

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
			freshwater input associated with the option will generally be low; and the habitat features are largely located some distance from the Ysgethin (the closest habitat feature, based on NRW mapping data[23], is the Sarn Badrig sub-tidal shingle ridge which contributes to the **Reefs** feature although this is several hundred metres offshore). Consequently, the marine features of the SAC will not be significantly affected by the option. With regard to **Otter**, it is arguable that the watercourses draining to the SAC are 'functional habitat' for this species (i.e. non-designated areas that may be important to the integrity of a SAC feature); however, otters are not directly dependent on the maintenance of flows and so potential effects will be associated with the functional value of the watercourse (e.g. for washing, resting, feeding, breeding or migration) during drought periods, which will not change substantially with the operation of the option compared to 'natural' drought conditions, except perhaps in relation to foraging opportunities[24]. It is important to note that the Ysgethin is one of a large number of streams and rivers entering the SAC, most of which will be equally suitable for otters and which will not be affected by the operation of any drought orders, and there is nothing to suggest that the Ysgethin is disproportionately important to the otter population of the SAC. As a result, significant effects on this feature will not occur. The scheme will therefore have no significant effects, alone or in combination (as far as in combination effects can be determined ahead of the permit application), on the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC.**		

[23] NRW (2017) *Pen Llyn a'r Sarnau SAC Regulation 35 Report: non-interactive A3 map* [online]. Available at: https://naturalresources.wales/media/681450/pen-llyn-ar-sarnau-non-interactive-a3-map.pdf [Accessed 13/07/17].

[24] Although the fish component of the Ysgethin waterbody is considered to be at major risk of short-term deterioration due to the drought order, this deterioration will be short-term, temporary and reversible. This will affect otters foraging in the Ysgethin but it is likely that hunting opportunities will increase for a period in a drought as fish become constrained by lower flows, then subsequently decline, although this will not affect the value of the watercourse in the medium term.

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
			None of the principal water resource sensitive interest features of the **Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC** are present in the Afon Ysgethin or the Coed-y-Gadol woodlands, although the some of the 'typical species' associated with the woodland features may have a small sensitivity to changes in splash zones and so significant effects are possible for this feature.		
8034-1	**Afon Dwyfor Drought Permit**	The drought permit involves a temporary increase of 1Ml/d in the daily abstraction rate at the Garndolbenmaen intake, without a corresponding increase in the daily regulation release rate from Llyn Cwmystradllyn when flow at Dolbenmaen weir is below the seasonal flow constraint limit. Drought permits can be granted for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to September to January, as confirmed by water resources modelling carried out by Welsh Water.	The Afon Henwy flows to the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC** via the Afon Dwyfor. As noted, the option will influence the Afon Henwy from Llyn Cwmystradllyn to the Afon Dwyfor confluence, with negligible hydrological impact on the Afon Dwyfor downstream to the tidal limit. Whilst some SAC features around the Dwyfor estuary (~2km downstream of the tidal limit) might be theoretically exposed to the operation of the scheme, as the hydrological impacts will be effectively nil below the tidal limit it is concluded that no significant effects will occur.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8109-1	**Reduce compensation water releases from Llwynon Reservoir**	The drought option involves a proposed reduction in the non-consumptive fisheries abstraction from Llwynon Reservoir to the Taf Fawr (which is in effect the compensation release) by 9.1 Ml/d, from 18.2 Ml/d to 9.1 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. Drought permits may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, while the reduction in compensation release has the potential to be implemented year round, it will be restricted to the period September to November inclusive. This is based on modelling of Llwynon Reservoir performance under normal operating conditions in dry summers, together with Welsh Water's experience of operating the source. Therefore for the purposes of this assessment the period of implementation for this drought permit is assumed to be likely to be the period September to November inclusive.	This option would reduce flows into the Afon Taf Fawr which ultimately flows to the **Severn Estuary SAC / SPA / Ramsar** sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8112-1	**Emergency abstraction from the River Rhondda at Treherbert**	The drought permit involves a new, unsupported emergency river abstraction of 1Ml/d from the Afon Rhondda Fawr adjacent to Treherbert to support raw water supply to the raw water storage reservoir at Tynywaun WTW. To enable the abstraction, a low, temporary weir constructed of sandbags, would be required across the Afon Rhondda Fawr. A temporary pipeline and mobile pumping equipment would need to be installed to lift abstracted water to Tyn y Waun WTW raw water reservoir. A modest volume of water would be available from this drought permit scheme during a drought, and there is benefit to supply locally through provision of an immediate additional water resource to an existing WTW. Drought permits may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought permit will be restricted to September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option would reduce flows in the Afon Rhondda Fawr which ultimately flows to the **Severn Estuary SAC / SPA / Ramsar** sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8116-3	**Utilise the Dead Storage in Talybont Reservoir**	It is assumed that a reduction of 50% in the statutory compensation flow release to the Nant Caerfanell (as permitted in the abstraction licence relating to the compensation flow control line) is already in place prior to this drought option being implemented. This drought option may be required in severe drawdown conditions when storage approaches the dead storage zone in Talybont Reservoir, and involves pumped abstraction of 30Ml/d from the dead storage zone for up to 30 days. This option would require installation of temporary pumping arrangements to utilise dead water within the reservoir. This would have minimal impact during the drought event but subsequent reservoir refill and spill will take longer as storage would start from a lower base position. Minor construction works required. Drought orders may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option would utilise dead storage in Talybont reservoir, which sits above the River Usk SAC. There is estimated to be a 3% increase (13 days) in the duration of the period for which storage is below top water level, and for which reservoir outflow is limited to compensation only as a result of the increased pumping from Talybont Reservoir's dead storage zone. This also leads to a delay of 13 days in the first occurrence of reservoir overflows following refill. However, the effects of this on the Usk will be nominal and not significant.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8119-1	**Compensation Water Reduction of 50% at Pontsticill Reservoir**	This option would require a reduction in the statutory compensation release from Pontsticill Reservoir to the Afon Taf Fechan by 9.1 Ml/d, from 19.1 Ml/d to 10 Ml/d. This will influence the downstream Afon Taf Fechan and its continuation, the River Taff. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. Drought orders may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option would reduce flows in the Afon Taf Fechan which ultimately flows to the **Severn Estuary SAC / SPA / Ramsar** sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8201-3	**Relax the maintained requirement below the Nantgaredig intake on the River Tywi**	This drought order involves a change in the abstraction conditions at the Nantgaredig intake to relax the requirement to maintain the downstream flow at an instantaneous daily minimum of 136Ml/d. Instead, the downstream flow requirement of 136Ml/d would be temporarily assessed as a 7-day rolling average, with the daily instantaneous minimum flow requirement temporarily reduced to 116Ml/d. This would enable Welsh Water to more efficiently target a rolling average downstream flow of 136Ml/d, whilst reducing the need to over-release at times of very low flow due to the time of travel between the reservoir and the downstream abstraction intake (24 hours or more) and the difficulties of predicting the next day's gauged flows. Drought orders may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option will have significant effects on the **Afon Tywi/ River Tywi SAC** as a result of its operation. Total flow upstream of the Nantgaredig intake is equal to the natural flow plus the controlled releases from the Llyn Brianne Reservoir. Downstream of the abstraction point, the natural flow component of the total flow upstream will remain, plus the regulation release at times when no abstraction is being made. The potential hydrological impact due to the implementation of the option stretches for a distance of 5.7km from the Nantgaredig intake to the tidal limit of the Afon Tywi. The downstream limit is however not clearly defined, as there is no physical barrier to limit the extent of tidal propagation upstream in the river. As the **Afon Tywi/ River Tywi SAC** is directly affected, all of the interest features are considered to be exposed and sensitive to the outcomes of the option, other than **Otter** which will have limited sensitivity to short-term hydrological changes. Otters are not directly dependent on the maintenance of flows and so potential effects will be associated with the functional value of the watercourse (e.g. for washing, resting, feeding, breeding or migration) during drought periods. This will not change substantially with the operation of the option compared to 'natural' drought conditions, except perhaps in relation to foraging opportunities; in this instance, it is possible that hunting opportunities will increase slightly for a period in a drought if fish become locally constrained by lower flows (although this is unlikely based on the location and scale of hydrological changes), then subsequently decline if drought conditions substantially affect fish populations (although the EAR does not suggest this is likely).,However, this will not affect the value of the watercourse in the medium term particularly given the localised extent of the hydrological changes and the short reach affected.	Construction: No - no construction required	Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8202-1	**Increase the Llechryd abstraction from 19 Ml/d to 21 Ml/d and obtain variation of annual licence amounts**	The drought order involves a proposed increase in the daily abstraction rate at the Llechryd intake, whereby the licence condition relating to the abstraction rate in any 24 hour period would be increased by 2Ml/d, from 19Ml/d to 21Ml/d. This would also require amendment of the hourly abstraction rate condition. The drought order would increase the unsupported river abstraction from the Afon Teifi. Drought orders may remain in force for a period of up to six months, and they can be extended for up to a further six months. There is an all year period of implementation for this drought order, however implementation is likely to occur in the summer period, as confirmed by water resources modelling carried out by Welsh Water.	This option will have significant effects on the **Afon Teifi/ River Teifi SAC** as a result of its operation, although effects are likely to be marginal based on the hydrological assessment.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.).
8203-2	**Pumped abstraction from Nantymoch (a HEP reservoir operated by Statkraft) into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW**	The drought permit involves a temporary pumped abstraction from Nant-y-Moch Reservoir, of up to 5Ml/d, to be transferred into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW, to support demands in the North Ceredigion WRZ. This would be a pumped abstraction from Nantymoch (a Statkraft reservoir operated for hydroelectric power), transferred into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW. The negotiated abstraction would fall within the range of the existing abstraction regime and it is likely that the diversion of this amount for public water supply would make no difference to the reservoir performance or the highly artificial flow regime of the Rheidol. This may require some localised construction works to abstract water and access the raw water main.	The Rheidol passes through the **Coedydd a Cheunant Rheidol/ Rheidol Woods and Gorge SAC**, although the features of this site are not sensitive to water resource permissions or flows within the river. The negotiated abstraction would fall within the range of Statkraft's existing abstraction regime and it is likely that the diversion of this amount for public water supply would make no difference to the reservoir performance or the highly artificial flow regime of the Rheidol. The ultimate downstream receptor is the **West Wales Marine / Gorllewin Cymru Forol SCI** at Aberystwyth, although operational effects will not be measurable at this distance downstream. There is a potential pathway for construction pollutants but this will not be realised (independently of any scheme-level best practice) due to the distance (hence attenuation), and the barrier provided by Dinas Reservoir.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8206-2	**Reduce the Compensation release from Preseli Reservoir by 50%**	This option would require a reduction in the statutory compensation release from the Rosebush Reservoir (also known as the Preseli Reservoir) to the Afon Syfynwy of 0.91 Ml/d from 1.82 Ml/d to 0.91 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought, and improve the probability of reservoir refill during the winter. Drought orders may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to August to November, as confirmed by water resources modelling carried out by Welsh Water. The scheme will reduce flows below the reservoir in the Afon Syfynwy before it flows into Llys-y-Fran Reservoir. Releases (including compensation releases) from Llys-y-Fran Reservoir to the downstream Afon Syfynwy would not be impacted by this option. However, the reduction in compensation releases from Preseli Reservoir will reduce inflow to Llys-y-Fran Reservoir.	This option would reduce proportionally the river flow into the Llys-y-Fran reservoir, and would therefore have a significant effect on the **Afonydd Cleddau/ Cleddau Rivers SAC** by reducing flows in the Afon Syfynwy, potentially affecting bullhead. With regard to in combination effects, it is only likely to affect the section of the SAC between the reservoirs, which is unlikely to be directly affected by any other options that could operate simultaneously.	Construction: No - no construction required	Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures

Option No.	Name	Description	Screening Summary	LSE (construction)?	LSE (operation?)
8206-7	**Use of freshet bank for public water supply - Llysyfran - (Pembs)**	In accordance with the Llys-y-Fran Reservoir Section 158 operating agreement, a total of 995Ml of the storage volume within Llys-y-Fran Reservoir is allocated to the freshet bank, to be released for fisheries management purposes at the direction of Natural Resources Wales (NRW). The drought order involves using 425Ml (approximately 43%) of this volume of storage for public water supply, so that only a limited number (three) of freshet releases could take place during the period of implementation. Drought orders may remain in force for a period of up to six months, and they can be extended for up to a further six months. However, the period of implementation for this drought order will be restricted to August to November.	The freshet is effectively 'spare' water made available for management, rather than a compensation flow or similar; as a result, the operation of the option would have no effect at all on the **Afonydd Cleddau/ Cleddau Rivers SAC** other than limiting the number of freshet releases that could take place whilst the option is being implemented.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

3.2 Inter-option 'in combination' screening assessment

The inter-option in combination screening assessment is set out in **Appendix C** and summarised in **Table 3.4**. This identifies all those European sites that could potentially be affected by one or more Revised Draft Drought Plan options, and then determines whether these options are likely to have and 'in combination' significant effects on the interest features, over and above the effects that are likely during a drought.

Table 3.3 Summary of screening stage 'in combination' assessment

European site	Options affecting site	LSE alone?	In combination summary
Afon Tywi/ River Tywi SAC	8201-3	Y	There is only one option affecting this site and so there will therefore be no 'inter-option' in combination effects.
Afonydd Cleddau/ Cleddau Rivers SAC	8206-2 8206-7	Y N	In combination effects between these options cannot occur: Option 8206-2 will not operate 'in combination' with the other options as it will only affect the river between Rosebush reservoir and Llys-y-Fran.
Anglesey Terns / Morwenoliaid Ynys Môn SPA	8001-3 8001-5	N N	The Anglesey Terns / Morwenoliaid Ynys Môn SPA is the downstream receptor for these options. The effects of these options 'alone' will be negligible. With regard to 'in combination' effects, the options will not affect the same areas of the site (so no risk of geographically coincident effects) and as the interest features of the site are not particularly sensitive to the outcomes of the options or reliant on the areas of the SPA that are potentially exposed there is no risk of cumulative effects on behaviours (e.g. simultaneous displacement from feeding areas etc.). There will therefore be no significant 'inter-option' in combination effects.
Liverpool Bay / Bae Lerpwl SPA	8012-2 8012-4 8012-5 8012-6	N N N N	The Liverpool Bay / Bae Lerpwl SPA is the downstream receptor for these options. The effects of these options 'alone' will be negligible, although all options will affect the River Clwyd which enters the SPA at Rhyl. However, it is several kilometres from the tidal limit of the Clwyd to the boundary of the SPA and so any residual hydrological effects will be largely attenuated by the SPA boundary. Furthermore, the open nature of the coast at this point ensures that the tidal flux in the marine areas is substantial, and this will be the dominant factor influencing habitat and marine biotopes locally. Furthermore, the interest features of the SPA will not be particularly sensitive to minor short-term changes in fresh-water inputs to the site, and any effects on the 'typical species' of the SPA habitats would be extremely local to the Clwyd estuary and would not result in consequent significant effects on the interest features. There will therefore be no significant 'inter-option' in combination effects.
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC	8021-1 8033-2 8034-1	N N N	The Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC is the downstream receptor for these options. The effects of these options 'alone' will be negligible. With regard to 'in combination' effects, the options will not affect the same areas of the site (so no risk of geographically coincident effects) and as the mobile interest features of the site are not particularly sensitive to the outcomes of the options or reliant on the areas of the SAC that are potentially exposed there is no risk of cumulative effects on behaviours (e.g. simultaneous displacement from feeding areas etc.). There will therefore be no significant 'inter-option' in combination effects.
River Usk/ Afon Wysg SAC	8116-3	N	One option is present in the catchment of the River Usk/ Afon Wysg SAC. There will therefore be no significant 'inter-option' in combination effects.

European site	Options affecting site	LSE alone?	In combination summary
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC	8001-2 8001-4	N N	The Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC is the downstream receptor for these options. The effects of these options 'alone' will be negligible. With regard to 'in combination' effects, the options will not affect the same areas of the site (so no risk of geographically coincident effects). There will therefore be no significant 'inter-option' in combination effects.

3.3 Screening Conclusions

The screening has concluded that significant effects are either likely or uncertain for the following sites and options; these are therefore taken forward to an appropriate assessment stage.

Table 3.4 Summary of options and sites requiring 'appropriate assessment'

Option	European sites	Alone or IC?
8033-2	Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	Alone
8201-3	Afon Tywi/ River Tywi SAC Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC	Alone Alone
8206-2	Afonydd Cleddau/ Cleddau Rivers SAC	Alone

The following sections of this report summarise the results of the option-specific appropriate assessments undertaken (see Ricardo (2019). *Dŵr Cymru Welsh Water Drought Plan 2020: Habitats Regulations Assessment – Stage 2 Appropriate Assessments*), which should be referred to for any additional contextual or assessment information that may be required.

4. Appropriate Assessment – Demand Management / Leakage Reduction

4.1 Demand Management / Leakage Reduction

The '**demand side**' measures are not geographically specific (water efficiency measures and leakage reduction programmes will occur across all WRZs) and are simply an escalation of the normal baseline programmes of water efficiency and leakage reduction that Welsh Water operates at all times. At times of drought, there would be a step-change in the intensity and spatial application of water efficiency and leakage reduction activity across the WRZs.

However, it is not possible to predict (at the strategic level) specific locations where these measures might be applied, and hence effects on specific European sites cannot be identified. It is anticipated that the 'demand side measures' will collectively have a positive effect on European sites during a drought by reducing water demand. The only realistic mechanism for a negative effect would be through direct encroachment at the local-level (for example a leaking pipe requiring repair might be located in or near an SAC), but the likelihood of this cannot be identified or meaningfully assessed at the strategic level since location-specific information on the measures is not available without specific investigations, which would form part of the package (for example, the precise location and severity of most leakages is not known), and there is consequently no information on the scale (etc.) of any construction required.

However, it is clear that the anticipated works associated with these options are not of a scale that would suggest that effects are unavoidable at the project stage, and the Revised Draft Drought Plan requires that the standard avoidance measures in **Appendix D** be employed (which includes a requirement for the potential for European sites to be affected to be considered at the planning stage). The Revised Draft Drought Plan does not imply any approval for schemes that come forward under these options or remove the need for project-level assessments, although the measures noted in **Appendix D** will ensure that potential adverse effects can be identified and avoided at the project stage. Therefore, from an HRA perspective, these options are 'screened in' (as an effect pathway is conceivable) but as a meaningful appropriate assessment is not possible, the assessment is necessarily deferred to the project level. The demand management and leakage-reduction options are therefore excluded from further assessment.

In practice, given the scale and type of activity anticipated for demand-side measures, it is (a) extremely unlikely that adverse effects would be possible and (b) if adverse effects were possible then alternatives would almost certainly be available, including 'do nothing' options in relation to the particular demand-side measure at hand.

5. Appropriate Assessment Summaries – Supply-Side Options

5.1 Overview

The following sections summarise the results of the option-specific appropriate assessments undertaken (see Ricardo (2019). Dŵr Cymru Welsh Water Drought Plan 2020: Habitats Regulations Assessment – Stage 2 Appropriate Assessments), which should be referred to for any additional contextual or assessment information that may be required. Note, any mitigation measures identified in the EARs and **Appendix D** are taken into account at this stage in accordance with 'People over Wind'.

5.2 Option 8033-2 (Llyn Bodlyn Compensation Reduction)

Option Summary and Effect Pathways

The operation of the scheme and the hydrological effects are described in detail in the EAR. In summary, this option involves a reduction in the compensation release from Llyn Bodlyn to the Afon Ysgethin from 2.18Ml/d to 1.18Ml/d for up to 12 weeks during the period from July to October inclusive (although 4 – 6 weeks is more likely). No new infrastructure would be required for this option. The EAR identifies hydrological effects during the summer and autumn period in two river reaches between the reservoir and the tidal limit of the Afon Ysgethin west of Tal-y-Bont:

- Reach 1 (reservoir to Pont Fadog): reductions of up to 46% in summer (July – September) low flows (Q_{95}); and
- Reach 2 (Pont Fadog to the tidal limit): reductions of up to 16.7% in summer (July – September) low flows (Q_{95}) at the top of Reach 2 (Pont Fadog), and 15.2% of October low flows (Q_{95}).

Screening Summary

The screening assessment for this option is detailed in **Appendix C**. In summary, the option will reduce flows in the Afon Ysgethin to its tidal limit west of Tal-y-Bont. The Ysgethin flows to the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC** via the Coed Cors-y-Gedol unit of the **Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC**, and so both of these sites are potentially exposed to the hydrological changes associated with the option.

Significant effects on the features of the **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC** will not occur (see **Table 3.2**) due to: the small-scale of hydrological changes at the mouth of the Ysgethin; the dominance of marine processes and tidal flux in the inshore areas of this section of coast; the limited sensitivity of the marine features to the predicted changes; the limited exposure of the marine habitat features to the predicted changes, based on their locations within the SAC; and because the Ysgethin is unlikely to provide a unique or otherwise notable habitat resource for **Otter** populations associated with the SAC.

With regard to the **Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC**, the only feature potentially exposed to the hydrological effects of this option is the **Old sessile oak woods with Ilex and Blechnum in the British Isles** feature which is present in the Coed Cors-y-Gedol SSSI unit of the SAC. This feature is not generally considered sensitive to water resource permissions[25]

[25] Based on EA (2007). Habitats Regulations Guidance, Environment Agency, Peterborough.

although some of the 'typical species' associated with the habitat in Coed Cors-y-Gedol SSSI may have some sensitivity to reduced river flows, specifically riparian bryophytes; this could result in adverse effects on integrity if species are lost due to drying associated with reduced mist and splash zones alongside the river during scheme operation.

There will be no effects (and so no possibility of 'in combination' effects) on any other European sites due to an absence of pathways for exposure to the environmental changes associated with the scheme, or because the features are not sensitive.

Appropriate Assessment – Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC

The Appropriate Assessment for this option assesses the effects of the scheme against the conservation objectives, favourable condition targets and current status of the SAC. The assessments for those features exposed and sensitive to the option are summarised below.

Old sessile oak woods with *Ilex and Blechnum* in the British Isles

Some of the 'typical species' associated with the habitat in Coed Cors-y-Gedol SSSI may have some sensitivity to reduced river flows, specifically riparian bryophytes; this could result in adverse effects on integrity if species are lost due to drying associated with reduced mist and splash zones alongside the river during scheme operation. Bryophyte surveys were undertaken in summer 2018[26], covering the river within the SAC (the upper sections of Reach 2 downstream of Pont Fadog). This survey recorded six of the indicative common and typical species of mosses identified by the Conservation Objectives, but none of the indicative uncommon species of mosses; however, populations of three nationally scarce species were recorded: *Heterocladium wulfsbergii, Platyhypnidium lusitanicum,* and *Porella pinnata*. These species are characteristic of deeply incised wooded watercourses in the more Atlantic parts of Wales and are likely to be sensitive to changes in such factors as ambient humidity, spray and frequency of inundation.

However, the assessment concluded that there would be **no adverse effects** on feature integrity (alone) for the following reasons:

- Potential additional changes in ambient humidity from levels expected in the absence of the option will negligible, and will be buffered by the woodland canopy and by the various springs;
- The additional effects on water levels as result of the option are likely to be small as flows will already be reduced during drought (i.e. those species closest to the 'normal' water level will already be affected by the low flows, with splash and misting already naturally limited).
- Many of the species associated with the river will be relatively tolerant of fluctuating water levels as this is, to some extent, a fundamental characteristic of the niche they are occupying and re-colonisation would be expected in the short-term.
- Given the limited duration of the drought order it is expected that any effects on the bryophyte community would be reversed following return to the normal hydrological regime.

The impact of the drought order on the **Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC** is therefore anticipated to be minor, reversible and short term, and not sufficient to adversely affect the integrity of the bryophyte populations of the site.

[26] Pilkington S (2018). *Afon Ysgethin Bryophyte Monitoring – Baseline Survey*. Report for Ricardo/ Welsh Water. Vegetation Survey & Assessment Ltd, Westbury.

In combination effects

No other drought permits / orders (either from Welsh Water, or by neighbouring water companies) will affect the Ysgethin or the Coed Cors-y-Gedol component of the SAC, and so 'in combination' effects will not occur. Potential 'in combination' effects with other projects can only be determined at the point of application. Possible 'in combination' effects with other plans are considered in **Section 6**.

5.3 Option 8201-3 (Afon Tywi / Nantgaredig Flow Relaxation)

Option Summary and Effect Pathways

The operation of the scheme and the hydrological effects are described in detail in the EAR. In summary, this option involves a change in the abstraction conditions at the Nantgaredig intake to relax the requirement to maintain the downstream flow at an instantaneous daily minimum of 136Ml/d. Instead, the downstream flow requirement of 136Ml/d would be temporarily assessed as a 7-day rolling average, with the daily instantaneous minimum flow requirement temporarily reduced to 116Ml/d. This would enable Welsh Water to more efficiently target a rolling average downstream flow of 136Ml/d, whilst reducing the need to over-release at times of very low flow due to the time of travel between the reservoir and the downstream abstraction intake (24 hours or more) and the difficulties of predicting the next day's gauged flows. The period of implementation for this drought order will be restricted to September to November, as confirmed by water resources modelling carried out by Welsh Water.

Total flow upstream of the Nantgaredig intake is equal to the natural flow plus the controlled releases from the Llyn Brianne Reservoir. Downstream of the abstraction point, the natural flow component of the total flow upstream will remain, plus the regulation release at times when no abstraction is being made. The potential hydrological impact due to the implementation of the option stretches for a distance of 5.7km from the Nantgaredig intake to the tidal limit of the Afon Tywi. The downstream limit is, however, not clearly defined, as there is no physical barrier to limit the extent of tidal propagation upstream in the river.

The hydrological study area includes four hydrological reaches:

- Reach 1 (Llyn Brianne to the Afon Bran confluence): During drought order implementation, there will be a reduction in extreme low flows (significantly below Q99) of up to 5.9% on occasional days in the period from September to November inclusive; this is considered a negligible hydrological impact.
- Reach 2 (Afon Bran confluence to Llandeilo Bridge): a reduction in extreme low flows (significantly below Q_{99}) of up to 5.6% on occasional days in the period from September to November inclusive; this is considered a negligible hydrological impact.
- Reach 3 (Llandeilo Bridge to the Welsh Water abstraction intake at Nantgaredig): a reduction in extreme low flows (significantly below Q_{99}) of up to 4.9% on occasional days in the period from September to November inclusive; this is considered a negligible hydrological impact.
- Reach 4 (Nantgaredig abstraction intake to the tidal limit): a reduction in extreme low flows (significantly below Q_{99}) of up to 14.7% on occasional days in the period from September to November inclusive; this is considered a minor hydrological impact

Reaches 2 – 4 are all within the Afon Tywi/ River Tywi SAC; approximately 2.3 km of Reach 1 upstream of the Afon Bran confluence is within the SAC.

The boundary of the **Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC** is approximately 9km downstream from the tidal limit on the Tywi. Two further tributaries contribute freshwater flow to the tidal reach of the Afon Tywi upstream of the boundary of the **Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC** (Afon Gwili and Tawelan Brook). Gauged flow data available for the Afon

Gwilli at Glangwilli indicates a minimum flow of 12.8 Ml/d from this tributary; there is no flow data for the Tawelan Brook although the minimum flow contribution from this watercourse is estimated as 1.4Ml/d based on gauged flow values at Capel Dewi gauging station and apportionment using relative catchment areas. At minimum flows, therefore, it is estimated that an additional 14.2Ml/d of freshwater flow enters the Afon Tywi upstream of the SAC boundary. The occasional 20Ml/d flow reduction due to the drought order would therefore represent a short-term 13.3% reduction in flows entering the **Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC**; the hydrological impact would be assessed as minor, and the extent of any effects would largely be confined to the upper estuarine section of the Afon Tywi where the influence of freshwater input is likely to be more pronounced compared to the tidal flux.

Screening Summary

The screening assessment for this option is detailed in **Appendix C**. In summary, the drought order will influence the Afon Tywi from the Llyn Brianne reservoir outflow to the tidal limit (approximately 2.5 km east of Carmarthen). The option will therefore directly affect the **Afon Tywi/ River Tywi SAC** with the potential to also affect the upper reaches of the **Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC**, the boundary of which is approximately 9km downstream from the tidal limit.

The screening concluded that all of the interest features of the **Afon Tywi/ River Tywi SAC** are sensitive and potentially exposed to the effects of the scheme, with the exception of **Otter** which are not considered particularly sensitive to the anticipated environmental changes. With regard to the **Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC**, the extent of any effects would largely be confined to the upper estuarine section of the Afon Tywi where the influence of freshwater input is likely to be more pronounced compared to the tidal flux. The interest features present in the upper Tywi estuary are (based on the Regulation 37 advice) **Estuaries, Mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), Sea lamprey, River lamprey, Twaite shad** and **Allis shad.** These features may be significantly affected**.** Localised areas of **Salicornia and other annuals colonizing mud and sand** may also occur, but this does not appear to be a key habitat in this area and so the feature is excluded from further consideration. The remaining interest features of the site are excluded from further assessment as they are either:

- marine or marine-dominated features (**Sandbanks which are slightly covered by sea water all the time**; and **Large shallow inlets and bays**) that will not be exposed or sensitive to the effects of this option; or
- are not thought to be particularly sensitive to the anticipated environmental changes (**Otter**)[27].

There will be no effects (and so no possibility of 'in combination' effects) on any other European sites due to an absence of pathways for exposure to the environmental changes associated with the scheme, or because the features are not sensitive.

Appropriate Assessment Summary – Afon Tywi/ River Tywi SAC

The Appropriate Assessment for this option assesses the effects of the scheme against the conservation objectives, favourable condition targets and current status of the SAC. The assessments for those features exposed and sensitive to the option are summarised below.

Allis and Twaite Shad

Shad egg deposition monitoring has recorded shad eggs as far upstream as Manordeilo in Reach 2, although the data suggest that the bulk of shad spawning in the Afon Tywi occurs between the tidal limit and Nantgaredig. The data appear to show a general reduction in egg deposition over the sampling years, which

[27] Including in relation to effects on prey species, see **Table 3.2**.

is consistent with the 'unfavourable' status assigned to shad in the condition assessment for the Afon Tywi SAC. Both species are assumed to be present in Reaches 2, 3 and 4. The conservation objectives require that all classified reaches within the site that contains, or should contain, twaite or allis shad under conditions of high environmental quality should comply with the targets given.

Adult shad primarily live in the marine environment, returning to freshwater ecosystems to spawn in spring and early summer. Spawning tends to occur in May and June in the main river channel. The drought order will only be implemented between September and November and so is unlikely to affect migration cues in the tidal reaches, the adult spawning run, or spawning and egg incubation. The drought order could, however, coincide with the downstream migration of the shad populations (late summer and early autumn).

There is a general downstream migration of juvenile shad in late summer and early autumn, with the majority having left the non-tidal river by November. The critical requirements for this feature during the implementation period (September to November) includes slow-flowing nursery areas for juveniles in fresh water above the estuary. However, the drought order is unlikely to have substantial effects on Q95 and Q99 flows. As such, the drought order is unlikely to result in changes in river hydraulics beyond those observed from the normal variations resulting from the consented abstraction during low flows. The lower reaches of the Afon Tywi is considered a meandering watercourse with associated features. These include a wide floodplain, oxbow lakes and gravel shoals. Although the drought order could result in a reduction in flow of up to 14.7%, the impact on this slow flowing habitat providing nursery areas is expected to be minimal due to the lowland nature of the reach. Furthermore, the drought order is likely to result in a reduction in depth of around 4.6% limited to a few days at a time. As the drought order implementation is likely to coincide with the downstream migration period of juvenile individuals for a few days at a time, the hydrological impacts on these days are expected to be minor at most; therefore, the assessment concludes that there will be **no adverse effects** on the **Twaite or Allis shad** populations as a result of the option.

Brook, River and Sea lamprey

Brook and river lamprey are thought to be widespread in the catchment (although targeted monitoring suggests relatively poor densities in areas of optimal habitat) and are therefore assumed to be present in Reaches 1 to 4. There are few records of lampreys in the upper half of the main Tywi river, although brook lamprey are probably present in several of the upland tributaries in the Tywi catchment such as the Llandovery Bran, Gwenlais and Camlais. Sea lamprey have been recorded on the Afon Tywi as far upstream as the Llandovery Bran despite the species being entirely absent at all survey locations across the catchment during lamprey-specific monitoring in 2004, although the species has been recorded at the Tywi fish counter in Nantgaredig, and it is assumed the species are present throughout the hydrological zone of influence. The weir associated with the abstraction at Llangadog is thought to present a potential barrier to migratory (sea and river) lamprey species and the RoC therefore assumed that spawning activity observed beyond this point in the Afon Tywi related to brook lamprey.

The appropriate assessment has concluded that there will be **no adverse effects on Sea lamprey, River lamprey or Brook lamprey** for several reasons, including the following observations:

- The drought order is unlikely to impact on Q95 and Q99 flows. As such, the drought order is unlikely to result in changes in river hydraulics beyond those observed from the normal variations resulting from the consented abstraction during low flows.
- The spawning migration for **Sea lamprey** in Europe usually takes place in April and May when the adults start to migrate back into fresh water, with spawning in late May or June. As such, the drought order is unlikely to impact on migration queues in the tidal reaches, adult migration or spawning and egg incubation.
- The hydrological impacts will only be observed for a limited number of days.

- The lower reaches of the Afon Tywi is considered a meandering watercourse with associated features. These include a wide floodplain, oxbow lakes and gravel shoals. Although the drought order could result in a reduction in flow of up to 14.7%, the impact on this slow flowing habitat providing nursery areas is expected to be minimal due to the lowland nature of the reach.

Bullhead

Bullhead are present throughout Reaches 1 to 4 although the status of the species is unknown beyond the 'unfavourable' classification in the 2008 Afon Tywi SAC condition assessment. **Bullhead** are sedentary and non-migratory fish that spawn from February to June (i.e. outside the period of drought option operation), requiring different habitats at different life stages ranging from riffles to deep pools to shelter from high flows. As a species common in upper reaches they are relatively tolerant of flow variation and water depth in itself is not a critical issue for bullhead providing it is > 0.05m. The appropriate assessment concludes that that there will be **no adverse effect on Bullhead** taking into account the baseline of low flow conditions prior to the implementation of the drought order, and the minor to negligible changes in velocity and water depth resulting in minimal impacts on habitat availability and quality for both adult and juvenile bullhead. The drought order is therefore unlikely to impact on the population structure and the distribution and density of this feature within the SAC.

In combination effects

No other drought permits / orders (either from Welsh Water, or by neighbouring water companies) will affect the **Afon Tywi/ River Tywi SAC**. Potential 'in combination' effects with other projects can only be determined at the point of application. Possible 'in combination' effects with other plans are considered in **Section 6**.

Appropriate Assessment Summary – Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC

The Appropriate Assessment for this option assesses the effects of the scheme against the conservation objectives, favourable condition targets and current status of the SAC. The assessments for those features exposed and sensitive to the option are summarised below. The hydrological impact is assessed as minor, and the extent of any effects would largely be confined to the upper estuarine section of the Afon Tywi where the influence of freshwater input is likely to be more pronounced compared to the tidal flux.

Estuaries, Mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

The extent of any effects would largely be confined to the upper estuarine section of the Afon Tywi where the influence of freshwater input is likely to be more pronounced compared to the tidal flux. The habitat interest features in the upper Tywi estuary are (based on the Regulation 37 advice) **Estuaries, Mudflats and sandflats not covered by seawater at low tide,** and **Atlantic salt meadows (Glauco-Puccinellietalia maritimae).**

With regard to the **Estuaries** feature, the Regulation 37 advice notes that "*the total extent of the intertidal mudflats and sandflats, intertidal hard substrate, subtidal sediment and hard substrate communities, Salicornia communities, Atlantic salt meadows and transitional saltmarsh communities is around 9,500 ha*." The Tywi is the largest contributor of freshwater to the SAC. The mosaic of estuarine habitats supports a large range of plant and animal communities, depending on the type of sediment, the salinity gradient and degree of exposure of the sediment to wave action and tidal streams. The other interest features **Mudflats and sandflats not covered by seawater at low tide,** and **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)** are components of the **Estuaries** feature. The upper reaches of the Tywi estuary are dominated

by mudflats (where large quantities of silt derived from the river are deposited), with Atlantic salt meadows developing in the middle and upper reaches of saltmarshes where tidal inundation still occurs but with decreasing frequency and duration. The upper reaches of the Tywi estuary includes several transitional saltmarsh and brackish (swamp) systems. Transitional low-marsh vegetation with *Puccinellia maritima*, annual *Salicornia* species and *Sueda maritima* is present in the Tywi estuary in a small but good quality and at Morfa Uchaf.

The hydrological assessment is set out in Appendix B of the EAR, and summarised for Reach 4 of the Tywi (the closest to this SAC) in Section 9.5. Essentially, the option impacts will only occur during the most extreme low flows ($<Q_{99}$) and only on occasional days, as the 7-day rolling average maintained flow of 136Ml/d means that the 20Ml/d reduction in regulation releases could only be maintained for a few days at a time and would need to be balanced by increased releases on subsequent/preceding days. Effects on Reach 4 are therefore minor only.

As noted, the boundary of the Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC is approximately 9km downstream from the tidal limit on the Tywi. Two further tributaries contribute freshwater flow to the tidal reach of the Afon Tywi upstream of the boundary of the Carmarthen Bay and Estuaries SAC (Afon Gwili and Tawelan Brook) and it is estimated that the occasional 20Ml/d flow reduction due to the drought order would therefore represent a short-term 13.3% reduction in flows entering the Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC; the hydrological impact would be assessed as minor, and the extent of any effects would largely be confined to the upper estuarine section of the Afon Tywi where the influence of freshwater input is likely to be more pronounced compared to the tidal flux.

The proposed drought order will lead to a small reduction in freshwater low flows which could impact the hydrodynamics of the transitional waterbody. The reduction in freshwater flow could result in an increase in the flushing time (due to a reduced residual river flow velocity) and an alteration to the mixing characteristics, leading to a possible increase in saline intrusion distance and migration of the turbidity maximum upstream. There could also be a reduction in connectivity at low spring tide. These changes could affect species composition, distribution and abundance (primarily in the mudflat and saltmarsh habitats, including invertebrate communities).

However, it must be recognised that changes in flows will be minor, short-term, temporary and reversible; estuaries are dynamic environments typically dominated by species tolerant of a wide range of physio-chemical conditions. Whilst there may be some localised responses in plant and invertebrate communities to changes in freshwater flows, the limited duration of the operation ensures that any such changes will also be minor, short-term, temporary and reversible. On this basis, **no adverse effects** on the integrity of the **Estuaries, Mudflats and sandflats not covered by seawater at low tide,** and **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)** features would be expected.

Sea lamprey, River lamprey, Twaite shad and Allis shad

The status of the populations of these species in the estuary is generally inferenced from survey data from the Afon Tywi; very limited data is available for the marine environment itself. The features are thought to be in unfavourable condition due to water quality issues. The hydrological impacts of the drought order could therefore interact with downstream migrations, and the estuary is an important nursery area before migration to the sea in winter, with the possibility of some juveniles overwintering in the estuary. However, the estuary is a substantially larger area of habitat than the river itself, and so species will be able to access wider areas of habitat in response to any localised exposure to the effects of the option. Therefore, the upper reaches of the Tywi estuary will be utilised by these species on migration and when resident in the estuary system, but the interest features will not be constrained to this area of the SAC.

The assessment for these species is largely as for the Afon Tywi/ River Towy SAC: although the drought order would be implemented between September and November (so could therefore interfere with downstream migration of some species) it will impact the extreme low flows only, with neither the Q95 or Q99 flows being

affected. The reduction will also only be experienced for occasional days and for less than a week at a time. It is therefore concluded that the very temporary reduction in residual flow will not give rise to any adverse effects on the populations of these species when within the estuary.

In combination effects

No other drought permits / orders (either from Welsh Water, or by neighbouring water companies) will affect the **Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC**. Potential 'in combination' effects with other projects can only be determined at the point of application. Possible 'in combination' effects with other plans are considered in **Section 6**.

5.4 Option 8206-2 (Preseli Reservoir Compensation Reduction)

Option Summary and Effect Pathways

The operation of the scheme and the hydrological effects and are described in detail in the EAR. In summary, this option involves a reduction in the statutory compensation release from Rosebush (Preseli) Reservoir to the Afon Syfynwy from 1.82Ml/d to 0.91Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought, and improve the probability of reservoir refill during the winter. The scheme will reduce flows below the reservoir in the Afon Syfynwy before it flows into Llys-y-Fran Reservoir. Releases (including compensation releases) from Llys-y-Fran Reservoir to the downstream Afon Syfynwy would not be impacted by this option and so only the Afon Syfynwy would be affected by the scheme. The timing of the reduction in the compensation release will be restricted to the summer and autumn period between August to November inclusive.

The compensation release would be reduced by up to 50% during drought permit operation, resulting in a 50% decrease in low and extreme low flows. The reduction in compensation discharge will include a reduction in wetted width and wetted depth below those normally observed in the Afon Syfynwy between the Rosebush and Llys-y-Fran reservoirs.

Screening Summary

The Afon Syfynwy forms part of the **Afonydd Cleddau/ Cleddau Rivers SAC.** The river flows steeply (descending 120m over 4.5km) down a tree-lined, v-shaped valley in an upland area. Sediment supply to the reach is interrupted by the Preseli Reservoir impoundment, and flow is modified through the reservoir release regime. The channel in Reach 1 is, therefore, considered to be heavily modified both in terms of flow and morphology. At low flows, flow accretion in the intervening catchment of the monitoring reach will be negligible. The monitoring reach is dislocated from the downstream Afon Syfynwy by the Llys-y-Fran Reservoir and so effects will be limited to the Afon Syfynwy. The key features associated with this reach (based on the Core Management Plan) are Brook lamprey and otter, although bullhead may also be present. The screening concluded that none of the interest features of the **Afonydd Cleddau/ Cleddau Rivers SAC** would be exposed to the effects of the option except for **Bullhead** and **Brook lamprey**, which may be present in the Afon Syfynwy. Otter will be exposed also but this feature is not considered sufficiently sensitive to the anticipated environmental changes to be affected.

Appropriate Assessment Summary – Afonydd Cleddau/ Cleddau Rivers SAC

Bullhead

Surveys of the river have only recorded juvenile brown trout, despite the presence of suitable habitat for bullhead within the surveyed stretches. As a result, it is assumed that this species is absent from the affected reach and so **no adverse effects** will occur.

Brook lamprey

There is currently no evidence to suggest brook lamprey species are present within the Afon Syfynwy and the reach is considered sub-optimal for lamprey ammocoetes. As a result, it is assumed that this species is absent from the affected reach and so **no adverse effects** will occur.

In combination effects

One other option will affect the **Afonydd Cleddau/ Cleddau Rivers SAC**, 8206-7 (Llys-y-Fran use of freshet bank). Option 8206-7 affects reaches downstream of Llys-y-Fran, and so 'in combination' effects cannot occur with this option (which affects the Afon Syfynwy upstream of Llys-y-Fran only). Potential 'in combination' effects with other projects can only be determined at the point of application. Possible 'in combination' effects with other plans are considered in **Section 6**.

5.5 Summary of Assessments

The appropriate assessments have indicated that there will be no adverse effects on any European sites as a result of the implementation of the Revised Draft Drought Plan options, alone or in combination with each other, based on the available data.

6. In Combination Effects

6.1 Overview

The extent to which the Revised Draft Drought Plan options can act 'in combination' is dependent on a number of variables. These include nature, location and timing of implementation of options, the number of options that are ultimately implemented either within a WRZ or across the supply area, and the interaction of these options with other plans or programmes. The effects are also dependent on the sensitivity of receptors to the effects of the options acting alone and in combination.

Fundamentally, the measures included in the Revised Draft Drought Plan would not necessarily be implemented in combination. The measures set out for each WRZ within the Revised Draft Drought Plan are a collection of measures that could be implemented on their own or in some circumstances together. The selection of the option or options to be implemented would be determined by a number of factors including the nature and intensity of the drought, operational requirements, and also on the potential environmental impacts of the option in question (as informed by the SEA and HRA of the Revised Draft Drought Plan). Further, some of the options are mutually exclusive and could not be implemented in combination.

These factors mean that the 'in combination' assessment of the impacts of the Revised Draft Drought Plan measures is not necessarily additive, and in this respect it should be recognised that the Revised Draft Drought Plan differs from other plans and programmes such as the WRMP where a number of 'preferred' options are selected for implementation in each WRZ. This means that it is potentially misleading to assess specific combinations of options either within a WRZ or across the supply area in an attempt to quantify the cumulative effects of options.

Furthermore, the precise nature of any 'in combination' effects on European site interest features are likely to be entirely dependent on the circumstances of the drought: for example, the impacts of two options on, say, spawning salmon would be different if operated in the spring compared to the autumn; and although some options may not operate simultaneously, they may still have impacts of some features if operated sequentially. The uncertainties associated with the in combination assessment are compounded by the uncertainties regarding future plans or projects that might be in operation when a drought option is implemented.

It is therefore important to recognise that any 'in combination' assessment undertaken at the strategy level is necessarily high-level and cannot reasonably predict all possible 'in combination' scenarios or even a 'worst case' scenario.

6.2 Between-option 'in combination' effects

The effects of options operating 'in combination' have been explored through the screening and appropriate assessment phases (see Sections 3.2 and 5.2 – 5.5). These assessments have concluded that none of the options are likely to result in adverse 'in combination' effects.

6.3 In combination effects with other plans and programmes

Effects with other strategic plans and water resource demand

Welsh Water's WRMP explicitly accounts for growth forecasts when calculating future water demand (and hence areas with potential deficits). This means that 'in combination' water-resource effects with growth promoted by other plans or projects are considered and accounted for during the WRMP development

process and its deficit calculations. Potential 'in combination' effects in respect of water-resource demands due to other plans or projects are therefore unlikely since these demands are explicitly modelled when determining deficit zones and hence developing Feasible Options.

Obviously local development plans are not all consistent with regard to planned growth and this arguably introduces some uncertainty. However, with regard to water resources and planning uncertainty it is important to note the following:

- The WRMP safeguards against uncertainty in option yield and timing through 'Target Headroom'; this is an allowance provided in the planning process (i.e. designed-in spare capacity) that ensures that any supply-demand deficit will still be met if there is an underperforming demand side measure or growth exceeds predicted levels. It is therefore extremely unlikely that additional demand or a poorly-performing option would 'suddenly' result in a deficit that might affect a European site; and (in any case).
- The WRMP is revised on a five-yearly cycle, which allows any changes in demand forecasts (e.g. as new plans come forward) to be accounted for, and for timely intervention should a measure not be performing as expected. It is also informally reviewed on an annual basis.

In theory, if a WRMP option results in less 'spare' water being available to water-resource sensitive sites then drought conditions may occur more frequently, and require a longer period for recovery from any temporary effects (depending on the hydrological functioning of the system); however, this type of effect is managed through licence conditions and minimum flow requirements which are designed to protect sites under a range of conditions, and Drought Plan options to alter such flow requirements would only be deployed after substantial additional study.

Therefore, the WRMP and regional water resource demand cannot arguably operate in combination with the Revised Draft Drought Plan options: if the WRMP options are implemented then they will become a part of the baseline against which the effects of the Revised Draft Drought Plan options will be assessed (with the Revised Draft Drought Plan options then permitted or not at the application stage); until the point of implementation, the Revised Draft Drought Plan options would operate 'alone' in a drought situation. Furthermore, the implementation of a WRMP option will invariably require that the Drought Plan for that WRZ be revised, since the fundamental operational parameters of the WRZ will have changed. Finally, the impacts will depend entirely on the nature of the drought situation. The Revised Draft Drought Plan will not therefore operate 'in combination' with the WRMP or associated land-use plans that may influence water resource demand.

Effects with major projects

Known major projects that are likely to increase demand have been taken into account during the development of Welsh Water's WRMP[28] and determination of future deficits (and hence the baseline for the Drought Plan). Reference has been made to the Planning Inspectorates National Infrastructure Projects database[29] which includes major projects, subject to the requirements of the Planning Act 2008. It includes projects:

- where the developer has advised the Planning Inspectorate in writing that they intend to submit an application in the future;
- where an application has already been made to the Planning Inspectorate and is undergoing the development consent process;

[28] See the *Demand Forecasts for Water Resources Management Plan 2010 Technical Report*, which is included in the appendices to the WRMP.
[29] https://infrastructure.planninginspectorate.gov.uk/projects/

- where a Development Consent Order (DCO) application has been determined.

Table 6.1 identifies those currently identified nationally significant infrastructure projects (NSIPs) that may affect European sites that are also exposed to potential effects associated with the Revised Draft Drought Plan. However, it must be recognised that a meaningful assessment is not possible at this point in the drought planning process as there is no certainty over when Revised Draft Drought Plan options might be deployed, nor necessarily the timescales for implementation of the NSIPs (many of which may well form part of the baseline by the time the Drought Option is implemented).

Table 6.1 Current NSIPs and known major projects with the potential for 'in combination' effects with the Revised Draft Drought Plan options

Project	Status	Summary	Interaction with Drought Plan (DP) options
Wylfa Newydd Nuclear Power Station	Examination	New nuclear power station on Anglesey; significant construction / operational effects likely on habitats etc off the north Anglesey coast; HRA ongoing.	New nuclear power station with adverse construction-phase effects on the **Anglesey Terns SPA**. The zone of influence will not extend to the marine sites within the zone of influence of other options in North Wales (including **Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC; Northern Cardigan Bay / Gogledd Bae Ceredigion SPA**; and **West Wales Marine / Gorllewin Cymru Forol SAC**). There is a theoretical risk of mobile species associated with these sites being affected by both schemes, although the effects of the DP options on these species will be negligible and in combination effects would not be expected.
Tidal Lagoon Cardiff / Newport	Pre-application	Proposed tidal lagoons on at Cardiff and Newport.	Substantive details on these schemes are not available, although they could affect mobile species associated with sites near the Severn Estuary, including the **Afon Wsyg/ River Usk SAC.** The zone of influence associated with the Usk options will not extend to the marine sites and so in combination effects would not be expected.
South Hook Combined Heat & Power Station	Decided	New Combined Heat & Power Station located on the northern edge of Milford Haven, approximately 30km downstream of the abstraction at Canaston Bridge. Scheme has been granted permission following an EIA and HRA.	The HRA for the South Hook scheme identified four European sites with features that are also potentially exposed to the effects of the DP options, as follows: • **Afonydd Cleddau/ Cleddau Rivers SAC** • **Pembrokeshire Marine/ Sir Benfro Forol SAC** • **Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston SAC** • **Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru SAC** Modelling work undertake for the HRA of the South Hook scheme suggests that the 'zone of influence' of operational and construction effects (principally discharges to Milford Haven, including warm water discharges) will not extend substantially upstream beyond the town of Milford Haven itself; as this point is at least 25km downstream of Canaston Bridge, and in a marine environment, it is certain that the zones of influence of the South Hook scheme and the DP will not intersect, and so coincident in combination effects on the habitat features of Afonydd Cleddau/ Cleddau Rivers SAC or Pembrokeshire Marine/ Sir Benfro Forol SAC will not occur. The mobile species of these SACs are theoretically vulnerable to in combination effects where these affect species at different points in their range or lifecycle. However, the HRA of the South Hook scheme also

Project	Status	Summary	Interaction with Drought Plan (DP) options
			concluded that there would be no adverse effects on the mobile species of these SACs.

Minor projects

It has not been possible to produce a definitive list of existing (minor) planning applications near the Revised Draft Drought Plan's zone of influence and, in reality given the uncertainty over the option implementation, generating a list at this stage would be of little value. It is possible that there will be 'in combination' scheme-specific construction effects associated with future planning applications, although this can only be assessed at the time of any application.

Effects with other strategic plans and development pressure

Regional and local plans have been reviewed at a high level to determine whether there are any likely significant 'in combination' effects (see **Appendix E**), with allocation sites identified where possible. This review has not indicated any potential or likely 'in combination' effects that could occur as a result of cumulative development pressure, and in reality the timescales involved in the implementation of the Revised Draft Drought Plan options and the absence of detail on allocation proposals makes any 'in combination' assessment difficult and potentially meaningless. However, the Revised Draft Drought Plan options are temporary and not of a scale or type that would make 'in combination' effects likely.

Water Company and Natural Resources Wales Drought Plans

The adjacent water companies are currently updating their drought plans and WRMPs, and so the in combination assessment is necessarily preliminary. However, based on the previous drought plans and the options proposed by Welsh Water, it is clear that there is very little chance of drought plan options from separate companies operating in combination to adversely affect a European site: the only sites likely to be vulnerable to in combination effects are the downstream receptor sites (principally the Severn Estuary SPA / SAC / Ramsar sites and the Liverpool Bay SPA), and the effects of the Welsh Water options on these sites will be essentially nil (so no possibility of in combination effects).

With regard to the NRW Drought Plan, this does not detail specific schemes or options but rather sets out the framework for decision-making during a drought and its intended approach to the management of water resources through its regulatory role. As a result, it will operate 'in combination' with the Welsh Water Drought Plan (as the two plans are part of the same regulatory and decision-making framework, and are intended to be complementary) but it will not have effects that are 'independent' of the Welsh Water Drought Plan options and which could therefore have significant 'in combination' effects on European sites (and, in any case, the effects of the NRW Drought Plan are likely to be positive).

7. Conclusion

The HRA of the Revised Draft Drought Plan has used the information in the EARs as a basis for the 'screening' of European sites that are hydrologically linked to the drought option, with other sites (e.g. sites with mobile species that may be exposed to 'non-hydrological' effects, such as from construction requirements) also subject to 'screening'. In practice, the screening of the Revised Draft Drought Plan considers all European sites within 20km of the location of any operational facilities or infrastructure required to deliver each option (including temporary infrastructure), plus any additional sites that might be hydrologically connected to the operational zone of influence. Mitigation measures are not accounted for at screening, in accordance with the 'People Over Wind'[30] case.

The screening concluded that significant effects (alone or in combination) are either likely, or could not be self-evidently excluded, for three options (see **Table 7.1** below). These sites and options were therefore taken forward to an appropriate assessment stage.

Table 7.1 Summary of options and sites requiring 'appropriate assessment'

Option	European sites	Alone or IC?
8033-2	Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	Alone
8201-3	Afon Tywi/ River Tywi SAC Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC	Alone Alone
8206-2	Afonydd Cleddau/ Cleddau Rivers SAC	Alone

In addition, the potential for construction works associated with the **demand management/leakage reduction options** to adversely affect European sites (taking into account anticipated mitigation measures) was also taken forward to 'appropriate assessment'.

'Appropriate assessments' of these options were undertaken (based on the EARs and in as much detail as can be achieved ahead of option delivery); these considered the environmental changes associated with each option and determined whether they would result in adverse effects on the integrity of any European sites. These 'appropriate assessments' are reported separately, and summarised within this HRA. The appropriate assessments concluded that there would be no adverse effects on integrity of any European sites as a result of option implementation.

The plan-level HRA has also considered 'in combination effects' with other plans and programmes; this has concluded that adverse effects would not occur, although obviously this conclusion would necessarily be subject to review if a Drought Option is deployed in the future and HRA is required.

The HRA of the Revised Draft Drought Plan therefore concludes that **no adverse effects on the integrity of any European sites will occur** based on the information available and the predicted operation of each option.

[30] Case C 323/17 Court of Justice of the European Union: People Over Wind

Appendix A
Summary of European Site Designations

Table A1 European site terminology

Term		Features
'European sites'	-	Strictly, 'European sites' are: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agree the site as a 'Site of Community Importance' (SCI); any classified Special Protection Area (SPA); any candidate SAC (cSAC); and (exceptionally) any other site or area that the Commission believes should be considered as an SAC but which has not been identified by the Government. However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') apply; and to possible SACs (pSACs) and listed Ramsar Sites, to which the provisions of the Habitats Regulations are applied a matter of Government policy when considering development proposals that may affect them. "European site" is therefore used as an umbrella term for all of the above designated sites.
Special Area of Conservation	SAC	Designated under the EU *Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora*, and implemented in the UK through the *Conservation of Habitats and Species Regulations 2017* (England and Wales), the *Conservation (Natural Habitats, &c.) Regulations 1994* (as amended) (Scotland) and the *Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995* (as amended).
Site of Community Importance	SCI	Sites of Community Importance (SCIs) are sites that have been adopted by the European Commission but not yet formally designated by the government of each country. Although not formally designated they are nevertheless fully protected by *Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora*, the *Conservation of Habitats and Species Regulations 2017* (England and Wales), the *Conservation (Natural Habitats, &c.) Regulations 1994* (as amended) (Scotland) and the *Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995* (as amended).
Candidate SAC	cSAC	Candidate SACs (cSACs) are sites that have been submitted to the European Commission, but not yet formally adopted. Although these sites are still undergoing designation and adoption they are still fully protected by *Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora*, the *Conservation of Habitats and Species Regulations 2017* (England and Wales), the *Conservation (Natural Habitats, &c.) Regulations 1994* (as amended) (Scotland) and the *Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995* (as amended).
Possible SACs	pSAC	Sites that have been formally advised to UK Government, but not yet submitted to the European Commission. The Governments in England, Scotland and Wales extend the same protection to these sites in respect of new development as that afforded to SACs as a matter of policy.
Draft SACs	dSAC	Areas that have been formally advised to UK government as suitable for selection as SACs, but have not been formally approved by government as sites for public consultation. These are not protected (unless covered by some other designation) and it is likely that their existence will not be established through desk study except through direct contact with the relevant statutory authority; however, the statutory authority is likely to take into account the proposed reasons for designation when considering potential impacts on them.

Term		Features
Special Protection Area	SPA	Designated under *EU Council Directive 79/409/EEC on the Conservation of Wild Birds* (the 'old Wild Birds Directive') and *Directive 2009/147/EC on the Conservation of Wild Birds* (the 'new Wild Birds Directive, which repeals the 'old Wild Birds Directive'), and protected by Article 6 of *Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora*. These directives are implemented in the UK through the *Wildlife & Countryside Act 1981* (as amended), the *Conservation of Habitats and Species Regulations 2017* (England and Wales), the *Conservation (Natural Habitats, &c.) Regulations 1994* (as amended) (Scotland), the *Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995* (as amended), the *Wildlife (Northern Ireland) Order 1985*, the *Nature Conservation and Amenity Lands (Northern Ireland) Order 1985* and *The Conservation (Natural Habitats, &C.) (Northern Ireland) Regulations 1995* (as amended) and the *Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007*.
Potential SPA	pSPA	These are sites that are still undergoing designation and have not been designated by the Secretary of State; however, ECJ case law indicates that these sites are protected under Article 4(4) of *Directive 2009/147/EC* (which in theory provides a higher level of protection than the Habitats Directive, which does not apply until the sites are designated as SPAs), and as a matter of policy the Governments in England, Scotland and Wales extend the same protection to these sites in respect of new development as that afforded to SPAs, and they may be protected by some other designation (e.g. SSSI).
'Proposed possible SPA'	ppSPA	An unusual and unformalized term occasionally applied to areas that may meet the criteria for designation as an SPA, but for which formal designation / consultation procedures are not yet underway; these are not protected by policy or legislation (although may be covered by existing designations, e.g. SSSIs) but may be referred to by statutory consultees in HRA consultation responses. The treatment of these areas in HRA is difficult as boundaries (etc.) are rarely defined.
Ramsar	-	The *Convention on Wetlands of International Importance especially as Waterfowl Habitat* (Ramsar Convention or Wetlands Convention) was adopted in Ramsar, Iran in February 1971. The UK ratified the Convention in 1976. In the UK Ramsar sites are generally underpinned by notification of these areas as Sites of Special Scientific Interest (SSSIs) (or Areas of Special Scientific Interest (ASSIs) in Northern Ireland). Ramsar sites therefore receive statutory protection under the *Wildlife & Countryside Act 1981* (as amended), and the *Nature Conservation and Amenity Lands (Northern Ireland) Order 1985*. However, as a matter of policy the Governments in England, Scotland and Wales extend the same protection to listed Ramsar sites in respect of new development as that afforded to SPAs and SACs.

Appendix B
European sites and interest features

Table A1 European sites within 20km of the Welsh Water area and associated interest features

Aberbargoed Grasslands SAC
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Afon Eden - Cors Goch Trawsfynydd SAC
Active raised bogs
Freshwater pearl mussel Margaritifera margaritifera
Atlantic salmon Salmo salar
Otter Lutra lutra
Floating water-plantain Luronium natans
Afon Gwyrfai a Llyn Cwellyn SAC
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Atlantic salmon Salmo salar
Otter Lutra lutra
Floating water-plantain Luronium natans
Afon Teifi/ River Teifi SAC
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Sea lamprey Petromyzon marinus
Brook lamprey Lampetra planeri
River lamprey Lampetra fluviatilis
Atlantic salmon Salmo salar
Bullhead Cottus gobio
Otter Lutra lutra
Floating water-plantain Luronium natans
Afon Tywi/ River Tywi SAC
Sea lamprey Petromyzon marinus
Brook lamprey Lampetra planeri
River lamprey Lampetra fluviatilis
Allis shad Alosa alosa
Twaite shad Alosa fallax
Bullhead Cottus gobio
Otter Lutra lutra
Afonydd Cleddau/ Cleddau Rivers SAC
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Active raised bogs
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Sea lamprey Petromyzon marinus
Brook lamprey Lampetra planeri
River lamprey Lampetra fluviatilis
Bullhead Cottus gobio
Otter Lutra lutra
Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

Tilio-Acerion forests of slopes, screes and ravines
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Anglesey Terns / Morwenoliaid Ynys Môn SPA
Sandwich tern Sterna sandvicensis
Roseate tern Sterna dougallii
Common tern Sterna hirundo
Arctic tern Sterna paradisaea
Avon Gorge Woodlands SAC
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Tilio-Acerion forests of slopes, screes and ravines
Bae Caerfyrddin/ Carmarthen Bay SPA
Black (common) scoter Melanitta nigra
Bae Cemlyn/ Cemlyn Bay SAC
Coastal lagoons
Perennial vegetation of stony banks
Berwyn a Mynyddoedd de Clwyd/ Berwyn and South Clwyd Mountains SAC
European dry heaths
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Blanket bogs (* if active bog)
Transition mires and quaking bogs
Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)
Calcareous rocky slopes with chasmophytic vegetation
Berwyn SPA
Red kite Milvus milvus
Hen harrier Circus cyaneus
Merlin Falco columbarius
Peregrine falcon Falco peregrinus
Blackmill Woodlands SAC
Old sessile oak woods with Ilex and Blechnum in the British Isles
Blaen Cynon SAC
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Brecon Beacons/ Bannau Brycheiniog SAC
European dry heaths
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
Calcareous rocky slopes with chasmophytic vegetation
Siliceous rocky slopes with chasmophytic vegetation
Bredon Hill SAC
Violet click beetle Limoniscus violaceus
Bristol Channel Approaches / Dynesfeydd Môr Hafren SCI
Harbour porpoise Phocoena phocoena
Burry Inlet Ramsar
Crit. 5 - regularly supports 20,000 or more waterbirds
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds
Burry Inlet SPA
Common shelduck Tadorna tadorna
Eurasian wigeon Anas penelope
Eurasian teal Anas crecca
Northern pintail Anas acuta
Northern shoveler Anas clypeata
Eurasian oystercatcher Haematopus ostralegus
Grey plover Pluvialis squatarola

Red knot Calidris canutus
Eurasian curlew Numenius arquata
Common redshank Tringa totanus
Ruddy turnstone Arenaria interpres
Dunlin Calidris alpina alpina
Waterbird assemblage
Waterfowl assemblage
Cadair Idris SAC
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
Blanket bogs (* if active bog)
Alkaline fens
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)
Calcareous rocky slopes with chasmophytic vegetation
Siliceous rocky slopes with chasmophytic vegetation
Old sessile oak woods with Ilex and Blechnum in the British Isles
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus
Caeau Mynydd Mawr SAC
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Cardiff Beech Woods SAC
Asperulo-Fagetum beech forests
Tilio-Acerion forests of slopes, screes and ravines
Cardigan Bay/ Bae Ceredigion SAC
Sandbanks which are slightly covered by sea water all the time
Reefs
Submerged or partially submerged sea caves
Sea lamprey Petromyzon marinus
River lamprey Lampetra fluviatilis
Bottlenose dolphin Tursiops truncatus
Grey seal Halichoerus grypus
Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC
Sandbanks which are slightly covered by sea water all the time
Estuaries
Mudflats and sandflats not covered by seawater at low tide
Large shallow inlets and bays
Salicornia and other annuals colonizing mud and sand
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
Sea lamprey Petromyzon marinus
River lamprey Lampetra fluviatilis
Allis shad Alosa alosa
Twaite shad Alosa fallax
Otter Lutra lutra
Carmarthen Bay Dunes/ Twyni Bae Caerfyrddin SAC
Embryonic shifting dunes
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")
Fixed coastal dunes with herbaceous vegetation ("grey dunes")

Dunes with Salix repens ssp. argentea (Salicion arenariae)
Humid dune slacks
Narrow-mouthed whorl snail Vertigo angustior
Petalwort Petalophyllum ralfsii
Fen orchid Liparis loeselii
Castlemartin Coast SPA
Red-billed chough Pyrrhocorax pyrrhocorax
Cernydd Carmel SAC
Turloughs
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Active raised bogs
Tilio-Acerion forests of slopes, screes and ravines
Clogwyni Pen Llyn/ Seacliffs of Lleyn SAC
Vegetated sea cliffs of the Atlantic and Baltic Coasts
Coed Cwm Einion SAC
Tilio-Acerion forests of slopes, screes and ravines
Coed y Cerrig SAC
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Coedwigoedd Dyffryn Elwy/ Elwy Valley Woods SAC
Tilio-Acerion forests of slopes, screes and ravines
Coedwigoedd Penrhyn Creuddyn/ Creuddyn Peninsula Woods SAC
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Tilio-Acerion forests of slopes, screes and ravines
Taxus baccata woods of the British Isles
Coedydd a Cheunant Rheidol/ Rheidol Woods and Gorge SAC
Old sessile oak woods with Ilex and Blechnum in the British Isles
Coedydd Aber SAC
Old sessile oak woods with Ilex and Blechnum in the British Isles
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Tilio-Acerion forests of slopes, screes and ravines
Old sessile oak woods with Ilex and Blechnum in the British Isles
Bog woodland
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Lesser horseshoe bat Rhinolophus hipposideros
Coedydd Llawr-y-glyn SAC
Old sessile oak woods with Ilex and Blechnum in the British Isles
Coedydd Nedd a Mellte SAC
Tilio-Acerion forests of slopes, screes and ravines
Old sessile oak woods with Ilex and Blechnum in the British Isles
Coetiroedd Cwm Elan/ Elan Valley Woodlands SAC
European dry heaths
Tilio-Acerion forests of slopes, screes and ravines
Old sessile oak woods with Ilex and Blechnum in the British Isles
Cors Caron Ramsar
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity

Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds
Cors Caron SAC
Active raised bogs
Degraded raised bogs still capable of natural regeneration
Transition mires and quaking bogs
Depressions on peat substrates of the Rhynchosporion
Bog woodland
Otter Lutra lutra
Cors Fochno and Dyfi Ramsar
Crit. 1 - sites containing representative, rare or unique wetland types
Cors Fochno SAC
Active raised bogs
Degraded raised bogs still capable of natural regeneration
Depressions on peat substrates of the Rhynchosporion
Corsydd Eifionydd SAC
Transition mires and quaking bogs
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus
Corsydd Llyn/ Lleyn Fens SAC
Calcareous fens with Cladium mariscus and species of the Caricion davallianae
Alkaline fens
Geyer`s whorl snail Vertigo geyeri
Desmoulin`s whorl snail Vertigo moulinsiana
Corsydd Môn a Llyn/ Anglesey and Llyn Fens Ramsar
Crit. 1 - sites containing representative, rare or unique wetland types
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity
Corsydd Môn/ Anglesey Fens SAC
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
Northern Atlantic wet heaths with Erica tetralix
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Calcareous fens with Cladium mariscus and species of the Caricion davallianae
Alkaline fens
Geyer`s whorl snail Vertigo geyeri
Southern damselfly Coenagrion mercuriale
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Cotswold Beechwoods SAC
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Asperulo-Fagetum beech forests
Craig yr Aderyn (Bird`s Rock) SPA
Red-billed chough Pyrrhocorax pyrrhocorax
Crymlyn Bog Ramsar
Crit. 1 - sites containing representative, rare or unique wetland types
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity
Crymlyn Bog/ Cors Crymlyn SAC
Transition mires and quaking bogs
Calcareous fens with Cladium mariscus and species of the Caricion davallianae
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Cwm Cadlan SAC
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Alkaline fens

Cwm Clydach Woodlands / Coedydd Cwm Clydach SAC
Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)
Asperulo-Fagetum beech forests
Cwm Doethie - Mynydd Mallaen SAC
European dry heaths
Old sessile oak woods with Ilex and Blechnum in the British Isles
Dee Estuary/ Aber Dyfrdwy SAC
Estuaries
Mudflats and sandflats not covered by seawater at low tide
Annual vegetation of drift lines
Vegetated sea cliffs of the Atlantic and Baltic Coasts
Salicornia and other annuals colonizing mud and sand
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
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
Deeside and Buckley Newt Sites SAC
Old sessile oak woods with Ilex and Blechnum in the British Isles
Great crested newt Triturus cristatus
Downton Gorge SAC
Tilio-Acerion forests of slopes, screes and ravines
Drostre Bank SAC
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Dunraven Bay SAC
Shore dock Rumex rupestris
Dyfi Estuary / Aber Dyfi SPA
Greenland white-fronted goose Anser albifrons flavirostris
Elenydd - Mallaen SPA
Red kite Milvus milvus
Merlin Falco columbarius
Elenydd SAC
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
European dry heaths
Calaminarian grasslands of the Violetalia calaminariae
Blanket bogs (* if active bog)
Floating water-plantain Luronium natans
Eryri/ Snowdonia SAC
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Alpine and Boreal heaths
Siliceous alpine and boreal grasslands
Alpine and subalpine calcareous grasslands
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
Blanket bogs (* if active bog)

Depressions on peat substrates of the Rhynchosporion
Petrifying springs with tufa formation (Cratoneurion)
Alkaline fens
Alpine pioneer formations of the Caricion bicoloris-atrofuscae
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)
Calcareous rocky slopes with chasmophytic vegetation
Siliceous rocky slopes with chasmophytic vegetation
Old sessile oak woods with Ilex and Blechnum in the British Isles
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus
Floating water-plantain Luronium natans
Exmoor Heaths SAC
Vegetated sea cliffs of the Atlantic and Baltic Coasts
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Blanket bogs (* if active bog)
Alkaline fens
Old sessile oak woods with Ilex and Blechnum in the British Isles
Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA
Manx shearwater Puffinus puffinus
Red-billed chough Pyrrhocorax pyrrhocorax
Glannau Môn: Cors heli / Anglesey Coast: Saltmarsh SAC
Estuaries
Mudflats and sandflats not covered by seawater at low tide
Salicornia and other annuals colonizing mud and sand
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
Glannau Ynys Gybi/ Holy Island Coast SAC
Vegetated sea cliffs of the Atlantic and Baltic Coasts
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Glannau Ynys Gybi/ Holy Island Coast SPA
Red-billed chough Pyrrhocorax pyrrhocorax
Glan-traeth SAC
Great crested newt Triturus cristatus
Glaswelltiroedd Cefn Cribwr/ Cefn Cribwr Grasslands SAC
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Glynllifon SAC
Lesser horseshoe bat Rhinolophus hipposideros
Gower Ash Woods/ Coedydd Ynn Gwyr SAC
Tilio-Acerion forests of slopes, screes and ravines
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Gower Commons/ Tiroedd Comin Gwyr SAC
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Southern damselfly Coenagrion mercuriale
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Grassholm SPA
Northern gannet Morus bassanus
Great Orme`s Head/ Pen y Gogarth SAC
Vegetated sea cliffs of the Atlantic and Baltic Coasts

European dry heaths
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Grogwynion SAC
European dry heaths
Calaminarian grasslands of the Violetalia calaminariae
Gweunydd Blaencleddau SAC
Northern Atlantic wet heaths with Erica tetralix
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Blanket bogs (* if active bog)
Transition mires and quaking bogs
Alkaline fens
Southern damselfly Coenagrion mercuriale
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Halkyn Mountain/ Mynydd Helygain SAC
European dry heaths
Calaminarian grasslands of the Violetalia calaminariae
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Great crested newt Triturus cristatus
Johnstown Newt Sites SAC
Great crested newt Triturus cristatus
Kenfig/ Cynffig SAC
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
Fixed coastal dunes with herbaceous vegetation ("grey dunes")
Dunes with Salix repens ssp. argentea (Salicion arenariae)
Humid dune slacks
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
Petalwort Petalophyllum ralfsii
Fen orchid Liparis loeselii
Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru SAC
Vegetated sea cliffs of the Atlantic and Baltic Coasts
Fixed coastal dunes with herbaceous vegetation ("grey dunes")
European dry heaths
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Caves not open to the public
Submerged or partially submerged sea caves
Greater horseshoe bat Rhinolophus ferrumequinum
Petalwort Petalophyllum ralfsii
Early gentian Gentianella anglica
Liverpool Bay / Bae Lerpwl SPA
Red-throated diver Gavia stellata
Black (common) scoter Melanitta nigra
Little gull Larus minutus
Common tern Sterna hirundo
Little tern Sterna albifrons
Waterbird assemblage
Waterfowl assemblage
Llangorse Lake/ Llyn Syfaddan SAC
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation
Llwyn SAC
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)

Llyn Dinam SAC
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation
Llyn Idwal Ramsar
Crit. 1 - sites containing representative, rare or unique wetland types
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities
Llyn Tegid Ramsar
Crit. 1 - sites containing representative, rare or unique wetland types
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities
Lyppard Grange Ponds SAC
Great crested newt Triturus cristatus
Mendip Limestone Grasslands SAC
European dry heaths
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Caves not open to the public
Tilio-Acerion forests of slopes, screes and ravines
Greater horseshoe bat Rhinolophus ferrumequinum
Mersey Estuary Ramsar
Crit. 5 - regularly supports 20,000 or more waterbirds
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds
Mersey Estuary SPA
Great crested grebe Podiceps cristatus
Common shelduck Tadorna tadorna
Eurasian wigeon Anas penelope
Eurasian teal Anas crecca
Northern pintail Anas acuta
Ringed plover Charadrius hiaticula
European golden plover Pluvialis apricaria
Grey plover Pluvialis squatarola
Northern lapwing Vanellus vanellus
Eurasian curlew Numenius arquata
Common redshank Tringa totanus
Black-tailed godwit Limosa limosa islandica
Dunlin Calidris alpina alpina
Mersey Narrows and North Wirral Foreshore Ramsar
Crit. 4 - supports plant/animal species at a critical stage in their life cycles, or provides refuge
Crit. 5 - regularly supports 20,000 or more waterbirds
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds
Mersey Narrows and North Wirral Foreshore SPA
Great cormorant Phalacrocorax carbo
Eurasian oystercatcher Haematopus ostralegus
Grey plover Pluvialis squatarola
Sanderling Calidris alba
Bar-tailed godwit Limosa lapponica
Common redshank Tringa totanus
Little gull Larus minutus
Common tern Sterna hirundo
red knot Calidris canutus islandica
Dunlin Calidris alpina alpina
Waterbird assemblage
Waterfowl assemblage
Midland Meres and Mosses Phase 2 Ramsar

Crit. 1 - sites containing representative, rare or unique wetland types
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities
Migneint-Arenig-Ddualt SAC
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
Natural dystrophic lakes and ponds
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Blanket bogs (* if active bog)
Old sessile oak woods with Ilex and Blechnum in the British Isles
Migneint-Arenig-Ddualt SPA
Hen harrier Circus cyaneus
Merlin Falco columbarius
Peregrine falcon Falco peregrinus
Montgomery Canal SAC
Floating water-plantain Luronium natans
Morfa Harlech a Morfa Dyffryn SAC
Embryonic shifting dunes
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")
Dunes with Salix repens ssp. argentea (Salicion arenariae)
Humid dune slacks
Petalwort Petalophyllum ralfsii
Mwyngloddiau Fforest Gwydir/ Gwydyr Forest Mines SAC
Calaminarian grasslands of the Violetalia calaminariae
Lesser horseshoe bat Rhinolophus hipposideros
Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal SPA
Red-billed chough Pyrrhocorax pyrrhocorax
Mynydd Epynt SAC
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus
North Anglesey Marine / Gogledd Môn Forol SCI
Harbour porpoise Phocoena phocoena
North Pembrokeshire Woodlands/ Coedydd Gogledd Sir Benfro SAC
Old sessile oak woods with Ilex and Blechnum in the British Isles
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Barbastelle Barbastella barbastellus
North Somerset and Mendip Bats SAC
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
Caves not open to the public
Tilio-Acerion forests of slopes, screes and ravines
Lesser horseshoe bat Rhinolophus hipposideros
Greater horseshoe bat Rhinolophus ferrumequinum
North West Pembrokeshire Commons/ Comins Gogledd Orllewin Sir Benfro SAC
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Transition mires and quaking bogs
Floating water-plantain Luronium natans
Northern Cardigan Bay / Gogledd Bae Ceredigion SPA
Red-throated diver Gavia stellata
Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston SAC
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
Lesser horseshoe bat Rhinolophus hipposideros

Greater horseshoe bat Rhinolophus ferrumequinum
Otter Lutra lutra
Pembrokeshire Marine/ Sir Benfro Forol SAC
Sandbanks which are slightly covered by sea water all the time
Estuaries
Mudflats and sandflats not covered by seawater at low tide
Coastal lagoons
Large shallow inlets and bays
Reefs
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
Submerged or partially submerged sea caves
Sea lamprey Petromyzon marinus
River lamprey Lampetra fluviatilis
Allis shad Alosa alosa
Twaite shad Alosa fallax
Otter Lutra lutra
Grey seal Halichoerus grypus
Shore dock Rumex rupestris
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC
Sandbanks which are slightly covered by sea water all the time
Estuaries
Mudflats and sandflats not covered by seawater at low tide
Coastal lagoons
Large shallow inlets and bays
Reefs
Salicornia and other annuals colonizing mud and sand
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
Submerged or partially submerged sea caves
Bottlenose dolphin Tursiops truncatus
Otter Lutra lutra
Grey seal Halichoerus grypus
Preseli SAC
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Depressions on peat substrates of the Rhynchosporion
Alkaline fens
Southern damselfly Coenagrion mercuriale
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus
Ramsey and St David`s Peninsula Coast SPA
Red-billed chough Pyrrhocorax pyrrhocorax
Rhinog SAC
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
Northern Atlantic wet heaths with Erica tetralix
European dry heaths
Alpine and Boreal heaths
Blanket bogs (* if active bog)
Depressions on peat substrates of the Rhynchosporion
Old sessile oak woods with Ilex and Blechnum in the British Isles
Floating water-plantain Luronium natans
Rhos Goch SAC

Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Active raised bogs
Transition mires and quaking bogs
Bog woodland
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
Rhos Llawr-cwrt SAC
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus
Rhos Talglas SAC
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
River Clun SAC
Freshwater pearl mussel Margaritifera margaritifera
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Sea lamprey Petromyzon marinus
Brook lamprey Lampetra planeri
River lamprey Lampetra fluviatilis
Atlantic salmon Salmo salar
Bullhead Cottus gobio
Otter Lutra lutra
Floating water-plantain Luronium natans
River Usk/ Afon Wysg SAC
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Sea lamprey Petromyzon marinus
Brook lamprey Lampetra planeri
River lamprey Lampetra fluviatilis
Allis shad Alosa alosa
Twaite shad Alosa fallax
Atlantic salmon Salmo salar
Bullhead Cottus gobio
Otter Lutra lutra
River Wye/ Afon Gwy SAC
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Transition mires and quaking bogs
White-clawed (or Atlantic stream) crayfish Austropotamobius pallipes
Sea lamprey Petromyzon marinus
Brook lamprey Lampetra planeri
River lamprey Lampetra fluviatilis
Allis shad Alosa alosa
Twaite shad Alosa fallax
Atlantic salmon Salmo salar
Bullhead Cottus gobio
Otter Lutra lutra
Severn Estuary Ramsar
Crit. 1 - sites containing representative, rare or unique wetland types
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity
Crit. 4 - supports plant/animal species at a critical stage in their life cycles, or provides refuge
Crit. 5 - regularly supports 20,000 or more waterbirds
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds
Crit. 8 - important source of food for fishes, spawning ground, nursery and/or migration path

Severn Estuary SPA
Tundra swan Cygnus columbianus bewickii
Common shelduck Tadorna tadorna
Gadwall Anas strepera
Common redshank Tringa totanus
Greater white-fronted goose Anser albifrons albifrons
Dunlin Calidris alpina alpina
Waterbird assemblage
Waterfowl assemblage
Severn Estuary/ Môr Hafren SAC
Sandbanks which are slightly covered by sea water all the time
Estuaries
Mudflats and sandflats not covered by seawater at low tide
Reefs
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
Sea lamprey Petromyzon marinus
River lamprey Lampetra fluviatilis
Twaite shad Alosa fallax
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA
Manx shearwater Puffinus puffinus
European storm-petrel Hydrobates pelagicus
Lesser black-backed gull Larus fuscus
Atlantic puffin Fratercula arctica
Short-eared owl Asio flammeus
Red-billed chough Pyrrhocorax pyrrhocorax
Seabird assemblage
St David`s / Ty Ddewi SAC
Vegetated sea cliffs of the Atlantic and Baltic Coasts
European dry heaths
Floating water-plantain Luronium natans
Sugar Loaf Woodlands SAC
Old sessile oak woods with Ilex and Blechnum in the British Isles
Tanat and Vyrnwy Bat Sites/ Safleoedd Ystlumod Tanat ac Efyrnwy SAC
Lesser horseshoe bat Rhinolophus hipposideros
The Dee Estuary Ramsar
Crit. 1 - sites containing representative, rare or unique wetland types
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities
Crit. 5 - regularly supports 20,000 or more waterbirds
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds
The Dee Estuary SPA
Common shelduck Tadorna tadorna
Eurasian teal Anas crecca
Northern pintail Anas acuta
Eurasian oystercatcher Haematopus ostralegus
Grey plover Pluvialis squatarola
Red knot Calidris canutus
Bar-tailed godwit Limosa lapponica
Eurasian curlew Numenius arquata
Common redshank Tringa totanus
Sandwich tern Sterna sandvicensis
Common tern Sterna hirundo

Little tern Sterna albifrons
Black-tailed godwit Limosa limosa islandica
Dunlin Calidris alpina alpina
Waterbird assemblage
The Stiperstones and The Hollies SAC
European dry heaths
Old sessile oak woods with Ilex and Blechnum in the British Isles
Traeth Lafan/ Lavan Sands, Conway Bay SPA
Great crested grebe Podiceps cristatus
Red-breasted merganser Mergus serrator
Eurasian oystercatcher Haematopus ostralegus
Eurasian curlew Numenius arquata
Common redshank Tringa totanus
Usk Bat Sites/ Safleoedd Ystlumod Wysg SAC
European dry heaths
Degraded raised bogs still capable of natural regeneration
Blanket bogs (* if active bog)
Calcareous rocky slopes with chasmophytic vegetation
Caves not open to the public
Tilio-Acerion forests of slopes, screes and ravines
Lesser horseshoe bat Rhinolophus hipposideros
Walmore Common Ramsar
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds
Walmore Common SPA
Tundra swan Cygnus columbianus bewickii
West Wales Marine / Gorllewin Cymru Forol SCI
Harbour porpoise Phocoena phocoena
Wye Valley and Forest of Dean Bat Sites/ Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena SAC
Lesser horseshoe bat Rhinolophus hipposideros
Greater horseshoe bat Rhinolophus ferrumequinum
Wye Valley Woodlands/ Coetiroedd Dyffryn Gwy SAC
Asperulo-Fagetum beech forests
Tilio-Acerion forests of slopes, screes and ravines
Taxus baccata woods of the British Isles
Lesser horseshoe bat Rhinolophus hipposideros
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC
Sandbanks which are slightly covered by sea water all the time
Mudflats and sandflats not covered by seawater at low tide
Large shallow inlets and bays
Reefs
Submerged or partially submerged sea caves
Y Twyni o Abermenai i Aberffraw/ Abermenai to Aberffraw Dunes SAC
Embryonic shifting dunes
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")
Fixed coastal dunes with herbaceous vegetation ("grey dunes")
Dunes with Salix repens ssp. argentea (Salicion arenariae)
Humid dune slacks
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation
Petalwort Petalophyllum ralfsii
Shore dock Rumex rupestris
Yerbeston Tops SAC

Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia
Ynys Seiriol / Puffin Island SPA
Great cormorant Phalacrocorax carbo

Appendix C
Screening Assessments

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8001-2	Removal of Llyn Cwellyn 10 Ml/d abstraction limit	The drought permit involves the relaxation of the low lake level abstraction rate at Llyn Cwellyn. When lake levels have fallen below 0.8m below spillway and the daily abstraction rate has reduced to 10Ml/d in the current licence conditions, the drought option proposes to operate the abstraction at a daily rate of 12Ml/d. The lake level at which abstraction ceases would be maintained as per the current licence conditions of 2.6m below spillway during the period 16 September to 15 November and 2.0m below spillway at all other times. Compensation releases would be maintained as per the current licence conditions of 11.4Ml/d when lake level is between 0.8m and 2.6m below spillway. Freshet releases would not be impacted by the drought option. The period of implementation for this drought order is likely to be May to October, as confirmed by water resources modelling carried out by Welsh Water.	The Afon Gwyrfai a Llyn Cwellyn SAC will be directly affected by the scheme, although these effects will be negligible. The operation of the scheme will maintain compensation releases to the Afon Gwyrfai and freshet releases would not be impacted. The maintenance of the compensation release will ensure that that the Afon Gwyrfai is protected during any drought period and the interest features of the lake (Oligotrophic to mesotrophic standing waters; and Floating Water Plantain) are likely to be reasonably resilient to fluctuating levels, particularly given the normal range of lake levels due to abstraction, and the overall depth of the lake. The scheme would result in a small additional drawdown of the lake (~1%) but this is not considered significant.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8001-3	Reduction of Alaw Compensation Water	The drought permit involves a proposed reduction in the statutory compensation release from Alaw Reservoir to the Afon Alaw of 1.5Ml/d, from 3.2Ml/d to 1.7Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The drought permit scheme will influence the downstream Afon Alaw from the outflow at Alaw Reservoir to the tidal limit. The period of implementation for this drought permit is likely to be July to December, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The operation of the scheme will influence the Afon Alaw from the outflow at Alaw Reservoir to the tidal limit at Llanfachraeth, which marks the boundary with the Anglesey Terns / Morwenoliaid Ynys Môn SPA. The Afon Alaw ultimately drains to Beddmanach Bay, which is partly covered by the North Anglesey Marine / Gogledd Môn Forol SCI. The hydrological impacts will end at the tidal limit (i.e. where the Anglesey Terns / Morwenoliaid Ynys Môn SPA begins); very localised short-term effects on water-resource sensitive habitat features within the estuary are conceivable, although in practice the small-scale of any changes and the extremely limited exposure and sensitivity of the interest features (tern species) will ensure that effects are 'not significant' alone.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8001-4	Reduction of Ffynnon Llugwy Compensation Water	The drought permit involves a proposed reduction in the compensation flow release from Ffynnon Llugwy to the Afon Llugwy from 4.5Ml/d to 2.5Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The period of implementation for this drought permit is likely to be July to December, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. This will affect the Afon Llugwy for approximately 1.5 km (as far as the Llyn Cowlyd stream capture leat, and potentially further downstream depending on the abstraction and compensation arrangements at the leat). No additional infrastructure would be required to enable this option to be implemented. The scheme will affect the Ffynnon Llugwy reservoir although this will largely be neutral or positive as water levels will be maintained for longer that if the DP were not in operation; the limnal features of the Eryri SAC are not thought to be present in this lake, based on the Management Plan, but would not be adversely affected if present. The Afon Llugwy will be affected by the operation of the scheme and is partially within the SAC, although none of the SAC interest features are dependent on maintenance of flows within the river, and so significant effects would not occur. The ultimate downstream receptor for this option is the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC, to which the Afon Llugwy flows via the Afon Conwy; however, the operation of the option will have negligible hydrological effects beyond Capel Curig, and any changes would be effectively undetectable at the SAC; on this basis, as effects at the SAC will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8001-5	Reduction of Cefni Reservoir Compensation Water	The drought permit involves a proposed reduction in the statutory compensation release from Cefni Reservoir to the Afon Cefni of 0.9Ml/d, from 1.8Ml/d to 0.9Ml/d. The period of implementation for this drought permit is likely to be July to December, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The scheme will influence the downstream Afon Cefni from the outflow at Cefni Reservoir to the tidal limit, and may affect effluent dilution from Llangefni WTW which discharges into the Afon Cefni approximately 4 km downstream of the compensation discharge point. The option would make use of existing infrastructure and would not require construction of new infrastructure. The ultimate downstream receptor for this option is the Anglesey Terns / Morwenoliaid Ynys Môn SPA, which covers the estuary of the Afon Cefni, and the Glannau Môn: Cors heli / Anglesey Coast: Saltmarsh SAC (boundary of all sites at Pont Malltraeth). However, the operation of the option will only affect the Afon Cefni to the tidal limit (at Pont Bulkeley, approximately 6.5km upstream of Pont Malltraeth) and hydrological changes would be effectively nil at the site boundaries; in addition, the features of these sites will not be particularly sensitive or exposed to any effects. On this basis no significant effects will occur. In addition, as effects at the SAC / SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8012-2	Reduction of the regulation release from Aled Isaf and modification of the Hands Off Flow value at Bryn Aled	The drought permit involves a proposed reduction of 2Ml/d in the regulation release rate from Aled Isaf Reservoir whenever abstraction is taking place and residual flow at Bryn Aled is below 29.5Ml/d. This would conserve the longevity of total reservoir storage for regulation releases to the Afon Aled for abstraction at the Bryn Aled intake. Drought actions and any future application for a drought permit would be managed by the Aled and Clwyd Consultative Group which would be convened under the terms of the Section 20 Operating Agreement with NRW. The period of implementation for this drought order is likely to be September to January, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The gain in supply will be made by slowing the drawdown of the Aled Reservoirs, enabling the regulation release to be sustained for longer. There would be no adverse impact in the upper reaches of the Afon Aled as the combined regulation and compensation releases would still be in excess of the normal full compensation release. The environmental impact would be to reduce the flows in the Afon Aled below the Bryn Aled abstraction point. The option would not require construction of new infrastructure. The ultimate downstream receptor for this option is the Liverpool Bay / Bae Lerpwl SPA, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be essentially undetectable at the site boundary; in addition, the features of this site will not be particularly sensitive or exposed to any effects associated with changes in freshwater flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8012-4	Relaxation of the annual licences on Afon Aled and the Plas Uchaf and Dolwen Reservoirs	The drought permit involves a relaxing the annual licence conditions on the Bryn Alde intake and Plas Uchaf and Dowlen Reservoir abstraction, to enable Welsh Water to abstract from the Aled catchment at high demands of up to the daily licensed maximum rates, to meet higher than usual demands in drought conditions. The period of implementation for this drought order is likely to be November to March, as confirmed by water resources modelling carried out by Welsh Water.	No construction is required for this option. The ultimate downstream receptor for this option is the Liverpool Bay / Bae Lerpwl SPA, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be undetectable at the site boundary; in addition, the features of this sites will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8012-5	Relaxation of the Llannerch boreholes annual licence	The drought permit involves a change in the abstraction licence at Llannerch through a temporary cessation of the annual abstraction rate condition. The maximum daily abstraction rate of 13.64Ml/d would still be applicable. The average daily abstraction that would be permissible within 12 months would be raised by 4.3Ml/d from 9.34Ml/d to 13.64Ml/d. This would provide a modest increase in water resource during a drought and increase the security of supply in the Clwyd Coastal WRZ by assisting post-drought winter refill of the Aled Reservoirs, by reducing demand from that resource. The period of implementation for this drought permit is likely to be September to January, as confirmed by water resources modelling carried out by Welsh Water.	The Llanerch boreholes are adjacent to the River Clwyd, which flows to the Liverpool Bay / Bae Lerpwl SPA at Rhyl. The operation of the proposed drought permit will affect local groundwater levels, thus influencing the Afon Clwyd and other watercourses in connectivity through the superficial deposits by reduction of baseflow. However, the drought permit would not alter the licence conditions under which the Clwyd Augmentation Scheme operates and the option will have negligible hydrological effects at the boundary of the SPA. In addition, the features of this site will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Clwyd. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8012-6	Pumped (winter) refill from Aled Isaf to Llyn Aled	Under the drought permit water from Aled Isaf Reservoir would be pumped up to Llyn Aled Reservoir to support refill. Such usage is not authorised by the existing abstraction licence and a drought permit would be required. Daily pumping rates have not been specified at this stage and so the assessment is based on an assumed transfer rate of 19.5Ml/d. Drought actions and any future application for a drought permit would be managed by the Aled Consultative Group which would be convened under the terms of the Section 20 Operating Agreement with NRW. The drought permit is most likely to occur during the autumn and winter period and is considered unlikely to extend outside the period November to February. This has been confirmed by Welsh Water's water resources modelling and understanding of operating the assets. It is assumed however that temporary pumping equipment and overground pipeline will be required to actively transfer water storage against the topographic gradient for approximately 1km from Aled Isaf to Llyn Aled.	This option is linked to Option 8012-4, where the dead storage in Llyn Aled is accessed. Llyn Aled has a small catchment so would take an extended period of time to refill;this option utilises the more rapid refill of Aled Isaf to support the refill of Llyn Aled through pumping of water from Aled Isaf back up to Llyn Aled. It is assumed however that temporary pumping equipment and overground pipeline will be required to actively transfer water storage against the topographic gradient for approximately 1km from Aled Isaf to Llyn Aled. The ultimate downstream receptor for this option is the Liverpool Bay / Bae Lerpwl SPA, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be undetectable at the site boundary; in addition, the features of this sites will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans. Construction of the scheme will not affect any European sites or features.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8021-1	Tankering raw water from Dysynni	The proposed drought permit would involve a daily abstraction of up to 0.44Ml/d from a temporary river abstraction intake located upstream of the Pont y Garth gauging station on the Afon Dysynni. The temporary intake is likely to be at a Natural Resources Wales Depot (NGR: SH635070). Appropriate screening for eels and salmonids will be provided at the abstraction intake which complies with the Eels (England and Wales) Regulations 2009. Suitable additional hardstanding for tankers would be provided at the selected location if required and the water abstracted would be transferred by tanker to the water treatment works at Penybont.	The Afon Dysynni ultimately flows to the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC; however, operational effects will not occur as the hydrological effects are predicted to be negligible beyond the confluence of the Dysynni with the Afon Fathew, which is just above the tidal limit and approximately 4.3km upstream of the SAC boundary. A temporary abstraction of 0.44Ml/d from the Afon Dysynni at the NRW depot would represent a 1% reduction in summer low flows and a 1.7% reduction in summer extreme low flows. The hydrological impact of this drought permit option is therefore considered to be negligible. Construction requirements are uncertain but will be very localised and minor and there is no possibility of these works affecting either the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC (distance, natural attenuation) or the features of the Craig yr Aderyn (Bird`s Rock) SPA (chough are generally tolerant of activities away from their nests and foraging areas, and any construction would be over 600m from the edge of the SPA). Therefore, significant effects will not occur.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8033-2	Reduce compensation water releases from Llyn Bodlyn	The drought order involves a proposed reduction in the statutory compensation flow release from Llyn Bodlyn to the Afon Ysgethin by 1 Ml/d, from 2.18 Ml/d to 1.18 Ml/d. This will conserve reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. the period of implementation for this drought order is likely to be July to October, as confirmed by water resources modelling carried out by Welsh Water	The option will potentially influence the downstream Afon Ysgethin. The timing of the reduction in the compensation release is most likely to occur during the late summer/early autumn period. This is based on modelling of the Llyn Bodlyn performance under normal operating conditions in dry summers, together with experience of operating the source. No new infrastructure would be required for this option. The Ysgethin flows to the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC via the Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC. The option will result in reductions of up to 16% in river flows in Reach 2 (i.e. to the tidal limit) with corresponding reductions in wetted depths/wetted widths (potential marginal habitats) during the summer and autumn period. However, the hydrological effects of the scheme on the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC are considered negligible. As the features of the SAC are almost exclusively marine (with the exception of Otter), their sensitivity to the minor variations in freshwater input associated with the option will generally be low; and the habitat features are largely located some distance from the Ysgethin (the closest habitat feature, based on NRW mapping data, is the Sarn Badrig sub-tidal shingle ridge which contributes to the Reefs feature although this is several hundred metres offshore). Consequently, the marine features of the SAC will not be significantly affected by the option. With regard to Otter, it is arguable that the watercourses draining to the SAC are 'functional habitat' for this species; however, the species is not particularly sensitive to the expected changes and the Ysgethin is one of a large number of streams and rivers entering the SAC, most of which will be equally suitable for otters and unaffected by the operation of any drought orders, and there is nothing to suggest that the Ysgethin is disproportionately important to the otter population of the SAC. None of the principal water resource sensitive interest features of the Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC are present in the Afon Ysgethin or the Coed-y-Gadol woodlands, although the some of the 'typical species' associated with the woodland features may have a small sensitivity to changes in splash zones and so significant effects are possible for this	Construction: No - no construction required	Operation: Uncertain - effect pathway present but effects likely to be minimal; appropriate assessment likely to confirm effects will not be significant.

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8034-1	Afon Dwyfor Drought Permit	The drought permit involves a temporary increase of 1Ml/d in the daily abstraction rate at the Garndolbenmaen intake, without a corresponding increase in the daily regulation release rate from Llyn Cwmystradllyn when flow at Dolbenmaen weir is below the seasonal flow constraint limit. This would enable Welsh Water to reduce their direct abstraction from Llyn Cwmystradllyn by 1Ml/d and thus conserve reservoir storage for later use for river regulation and/or direct supply during a drought. This drought permit will potentially influence the Afon Henwy from Llyn Cwmystradllyn to the Afon Dwyfor confluence, and the Afon Dwyfor downstream to the tidal limit. The period of implementation for this drought order is likely to be September to January, as confirmed by water resources modelling carried out by Welsh Water.	The Afon Henwy flows to the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC via the Afon Dwyfor. As noted, the option will influence the Afon Henwy from Llyn Cwmystradllyn to the Afon Dwyfor confluence, with negligible hydrological impact on the Afon Dwyfor downstream to the tidal limit. Whilst some SAC features around the Dwyfor estuary (~2km downstream of the tidal limit) might be theoretically exposed to the operation of the scheme, as the hydrological impacts will be effectively nil below the tidal limit it is concluded that no significant effects will occur.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8109-1	Reduce compensation water releases from Llwynon Reservoir	The drought option involves a proposed reduction in the non-consumptive fisheries abstraction from Llwynon Reservoir to the Taf Fawr (which is in effect the compensation release) by 9.1 Ml/d, from 18.2 Ml/d to 9.1 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The period of implementation for this drought permit is assumed to be the period September to November inclusive.	This option would reduce flows into the Afon Taf Fawr which ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8109-4	Emergency abstraction from the Afon Lwyd at New Inn	The drought permit involves a new, unsupported emergency river abstraction of 12Ml/d from the Afon Lwyd, at New Inn, between Pontypool and Cwmbran, which would supply either Llandegfedd Reservoir or Sluvad WTW via a temporary pipeline (approximately 2.5km). To enable abstraction a low temporary weir would be required across the Afon Lwyd. The drought permit abstraction would not be for additional water, but would transfer the sum of the existing abstraction licences to the proposed location. The timing of the drought permit is most likely to occur during the period from September to November inclusive, and will influence the Afon Lwyd downstream of the abstraction to its tidal limit at Caerleon. The weir is also likely to act as an impassable physical barrier upstream of the temporary weir. At this stage, it is not envisaged that the temporary weir will incorporate a fish pass. The period of implementation for this drought permit is likely to be September to November.	The Afon Lwyd ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites via the River Usk SAC. The proposals will utilise a proportion of the flow from the Afon Lwyd. Some of the mobile species of the Usk (e.g. Atlantic salmon, Otter) are also known to use the Afon Lwyd, and could potentially be affected by the scheme although the River Usk itself is considered to be beyond the zone of hydrological influence for the scheme. In addition, construction of the artificial weir has the potential to affect the Usk, if not appropriately planned and managed (although such effects can probably be avoided with scheme-specific measures. Significant effects on the River Usk SAC are possible.	Construction: Yes - effects possible but significant or significant adverse effects clearly avoidable with established scheme-level avoidance or mitigation measures	Operation: Uncertain - effect pathway present but effects likely to be minimal; appropriate assessment likely to confirm effects will not be significant.

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8112-1	Emergency abstraction from the River Rhondda at Treherbert	The drought permit involves a new, unsupported emergency river abstraction of 1Ml/d from the Afon Rhondda Fawr adjacent to Treherbert to support raw water supply to the raw water storage reservoir at Tynywaun WTW. To enable the abstraction, a low, temporary weir constructed of sandbags, would be required across the Afon Rhondda Fawr. A modest volume of water would be available from this drought permit scheme during a drought, and there is benefit to supply locally through provision of an immediate additional water resource to an existing WTW. A temporary pipeline and mobile pumping equipment would need to be installed to lift abstracted water to Tyn y Waun WTW raw water reservoir. The period of implementation for this drought permit is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option would reduce flows in the Afon Rhondda Fawr which ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8116-3	Utilise the Dead Storage in Talybont Reservoir	It is assumed that a reduction of 50% in the statutory compensation flow release to the Nant Caerfanell (as permitted in the abstraction licence relating to the compensation flow control line) is already in place prior to this drought option being implemented. This drought option may be required in severe drawdown conditions when storage approaches the dead storage zone in Talybont Reservoir, and involves pumped abstraction of 30Ml/d from the dead storage zone for up to 30 days. This option would require installation of temporary pumping arrangements to utilise dead water within the reservoir. This would have minimal impact during the drought event but subsequent reservoir refill and spill will take longer as storage would start from a lower base position. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option would utilise dead storage in Talybont reservoir, which sits above the River Usk SAC. There is estimated to be a 3% increase (13 days) in the duration of the period for which storage is below top water level, and for which reservoir outflow is limited to compensation only as a result of the increased pumping from Talybont Reservoir's dead storage zone. This also leads to a delay of 13 days in the first occurrence of reservoir overflows following refill. However, the effects of this on the Usk will be nominal and not signficant. Construction will be minor and localised within the reservoir and will not affect any designated sites.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8119-1	Compensation Water Reduction of 50% at Pontsticill Reservoir	This option would require a reduction in the statutory compensation release from Pontsticill Reservoir to the Afon Taf Fechan by 9.1 Ml/d, from 19.1 Ml/d to 10 Ml/d. This will influence the downstream Afon Taf Fechan and its continuation, the River Taff. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option would reduce flows in the Afon Taf Fechan which ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8201-1	Reduce Crai compensation flow by 50%	This option will require a reduction in the statutory compensation release from Crai Reservoir to the Afon Crai from 6.82 Ml/d to 3.4 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought, and improve the probability of reservoir winter refill. The period of implementation for this drought order is likely to be August to November, as confirmed by water resources modelling carried out by Welsh Water.	The Afon Crai is part of the River Usk SAC and the compensation releases from Crai Reservoir will be a substantial proportion of the flow during low flow periods as there are no significant tributaries to the Afon Crai downstream of Crai Reservoir until the confluence with the River Usk ~ 9.3 km downstream of Crai Reservoir. This option will have signficant effects on the River Usk SAC as a result of its operation. The SAC management units likely to be affected are units 9 (upper Usk tributaries including the Afon Crai) and 6 (main river Usk above Brecon). Hydrological effects are unlikely to be measurable downstream of the Afon Cilieni confluence based on the EAR; those features associated with the lower reaches of the Usk below Brecon (based on the Core Management Plan) will not therefore be exposed to the likely effects of the scheme. No other sites have features exposed to the effects of the scheme.	Construction: No - no construction required	Operation: Yes - significant effects certain and adverse effects may be unavoidable.
8201-3	Relax the maintained requirement below the Nantgaredig intake on the River Tywi	This drought order involves a change in the abstraction conditions at the Nantgaredig intake to relax the requirement to maintain the downstream flow at an instantaneous daily minimum of 136Ml/d. Instead, the downstream flow requirement of 136Ml/d would be temporarily assessed as a 7-day rolling average, with the daily instantaneous minimum flow requirement temporarily reduced to 116Ml/d. This would enable Welsh Water to more efficiently target a rolling average downstream flow of 136Ml/d, whilst reducing the need to over-release at times of very low flow due to the time of travel between the reservoir and the downstream abstraction intake (24 hours or more) and the difficulties of predicting the next day's gauged flows. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.	This option will have signficant effects on the Afon Tywi/ River Tywi SAC as a result of its operation. Total flow upstream of the Nantgaredig intake is equal to the natural flow plus the controlled releases from the Llyn Brianne Reservoir. Downstream of the abstraction point, the natural flow component of the total flow upstream will remain, plus the regulation release at times when no abstraction is being made. The potential hydrological impact due to the implementation of the option stretches for a distance of 5.7km from the Nantgaredig intake to the tidal limit of the Afon Tywi. The downstream limit is however not clearly defined, as there is no physical barrier to limit the extent of tidal propagation upstream in the river.	Construction: No - no construction required	Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8201-4	Reduce Brianne compensation flow by 50%-winter refill only	The drought order involves reducing the compensation release rate from Llyn Brianne by 50%, from 68Ml/d to 34Ml/d, at times when flows in the lower Tywi catchment are sufficiently high such that regulation releases to support abstractions at Nantgaredig are not required. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.	The Afon Tywi flows through the Cwm Doethie – Mynydd Mallaen SAC and the Elenydd – Mallaen SPA although the interest features of these sites will not be exposed and sensitive to the outcomes of the option. This option will have significant effects on the Afon Tywi/ River Tywi SAC as a result of its operation however. The drought order will influence the River Tywi from the Llyn Brianne reservoir outflow to the tidal limit.	Construction: No - no construction required	Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures
8202-1	Increase the Llechryd abstraction from 19 Ml/d to 21 Ml/d and obtain variation of annual licence amounts	The drought order involves a proposed increase in the daily abstraction rate at the Llechryd intake, whereby the licence condition relating to the abstraction rate in any 24 hour period would be increased by 2Ml/d, from 19Ml/d to 21Ml/d. This would also require amendment of the hourly abstraction rate condition. The drought order would increase the unsupported river abstraction from the Afon Teifi. There is an all year period of implementation for this drought order, however implementation is likely to occur in the summer period, as confirmed by water resources modelling carried out by Welsh Water.	Llechryd WTW is located in the south-west of the Mid South Ceredigion WRZ. It is fed by an abstraction from the nearby Afon Teifi. The intake for the WTW is about 4.4km upstream of the tidal limit. Flow in the Afon Teifi is unsupported by upstream releases and the surface water abstraction results in a removal of a proportion of the downstream flow. During a drought, river flows would be low and the increase in abstraction rate would reduce proportionally the river flow downstream of the intake. However, the EAR has determined that the effects on flows in the Teifi will be negligible for all reaches considered (1% reduction in the Q95 flow value). Consequently, the features of the Afon Teifi SAC will not be significantly affected by scheme operation.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)
8203-2	Pumped abstraction from Nantymoch (a HEP reservoir operated by Statkraft) into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW	The drought permit involves a temporary pumped abstraction from Nant-y-Moch Reservoir, of up to 5Ml/d, to be transferred into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW, to support demands in the North Ceredigion WRZ. This would be a pumped abstraction from Nantymoch (a Statkraft reservoir operated to make hydro electric power), transferred into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW. The negotiated abstraction would fall within the range of the existing abstraction regime and it is likely that the diversion of this amount for public water supply would make no difference to the reservoir performance or the highly artificial flow regime of the Rheidol. This may require some localised construction works to abstract water and access the raw water main.	The Rheidol passes through the Coedydd a Cheunant Rheidol/ Rheidol Woods and Gorge SAC, although the features of this site are not sensitive to water resource permissions or flows within the river. The negotiated abstraction would fall within the range of Statkraft's existing abstraction regime and it is likely that the diversion of this amount for public water supply would make no difference to the reservoir performance or the highly artificial flow regime of the Rheidol. The ultimate downstream receptor is the West Wales Marine / Gorllewin Cymru Forol SCI at Aberystwyth, although operational effects will not be measurable at this distance downstream. There is a potential pathway for construction pollutants but this will not be realised (independently of any scheme-level best practice) due to the distance (hence attenuation) and barrier provided by Dinas Reservoir.	Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8206-1	Reduce the required prescribe flow below the Crowhill Abstraction	The drought order involves a change in the abstraction conditions at the Crowhill intake. The prescribed flow requirement of 37.58Ml/d means that at river flows of less than 58.75Ml/d (or 110.25Ml/d from April to June and October to December), the full daily licensed volume cannot be abstracted at the Crowhill intake. The drought order would allow the river abstraction from the Western Cleddau to continue as long as flows do not fall below a lower prescribed flow of 18.79Ml/d, increasing the amount of water that can be abstracted at times of low river flows. The seasonal reduced daily abstraction limit would also be temporarily removed from October to December inclusive, so that the lower prescribed flow of 18.79Ml/d would apply throughout the period of implementation of the drought order. The revised abstraction arrangements would legally be authorised for a maximum of 6 months. Use of the drought order powers would be removed sooner if water resources have returned to adequate levels to safeguard future water supplies, as agreed with the Welsh Ministers / Natural Resources Wales (NRW).	This option will have a significant operational effect on the Afonydd Cleddau/ Cleddau Rivers SAC and may affect the Pembrokeshire Marine/ Sir Benfro Forol SAC.	Construction: No - no construction required	Operation: Yes - significant effects certain and adverse effects may be unavoidable.
8206-2	Reduce the Compensation release from Preseli Reservoir by 50%	This option would require a reduction in the statutory compensation release from the Rosebush Reservoir (also known as the Preseli Reservoir) to the Afon Syfynwy of 0.91 Ml/d from 1.82 Ml/d to 0.91 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought, and improve the probability of reservoir refill during the winter. The period of implementation for this drought order is likely to be August to November, as confirmed by water resources modelling carried out by Welsh Water. The scheme will reduce flows below the reservoir in the Afon Syfynwy before it flows into Llys-y-Fran Reservoir. Releases (including compensation releases) from Llys-y-Fran Reservoir to the downstream Afon Syfynwy would not be impacted by this option. However, the reduction in compensation releases from Preseli Reservoir will reduce inflow to Llys-y-Fran Reservoir.	This option would reduce proportionally the river flow into the Llys-y-Fran reservoir, and would therefore have a significant effect on the Afonydd Cleddau/ Cleddau Rivers SAC by reducing flows in the Afon Syfynwy, potentially affecting bullhead. With regard to in combination effects, it is only likely to affect the section of the SAC between the reservoirs, which is unlikely to be directly affected by any other options that could operate simultaneously.	Construction: No - no construction required	Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures
8206-7	Use of freshet bank for public water supply - Llysyfran - (Pembs)	In accordance with the Llys-y-Fran Reservoir Section 158 operating agreement, a total of 995Ml of the storage volume within Llys-y-Fran Reservoir is allocated to the freshet bank, to be released for fisheries management purposes at the direction of Natural Resources Wales (NRW). The drought order involves using 425Ml (approximately 43%) of this volume of storage for public water supply, so that only a limited number (three) of freshet releases could take place during the period of implementation. The period of implementation for this drought order is likely to be August to November.	The freshet is effectively 'spare' water made available for management, rather than a compensation flow or similar; as a result, the operation of the option would have no effect at all on the SAC, other than limiting the number of freshet releases that could take place whilst the option is being implemented.	Construction: No - no construction required	Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Habitats Regulations Assessment - Summary of Initial Assessment of Feasible Options

Number	Name	Summary (from proforma)	General Assessment	Significant effects? (Construction)	Significant effects? (Operation)
8206-8	Relax Canaston Handsoff flow	The drought order involves the relaxation of two parts of the abstraction licence: (1) a proposed 50% reduction in the hourly flow rate downstream of the Canaston intake which triggers the requirement to ensure that the hourly rate of discharge from Llys-y-Fran Reservoir equals or exceeds the hourly abstraction rate, and; (2) a relaxation of the seasonal flow-related limits on daily abstraction which normally apply during the months of October to December inclusive. The combined effect of these two relaxations would reduce the requirement for regulation releases such that releases are only triggered once the unsupported flow flows fall below 34.1 Ml/d. Whenever the flow downstream of the authorised point of abstraction is below 34.1 Ml/d, the drought order will have no impact on the need to regulate, nor on the flows downstream of the intake. However, the drought order will reduce the threshold for regulation releases being required. The period of implementation for this drought order is likely to be August to November, as confirmed by water resources modelling carried out by Welsh Water.	This option will have a significant operational effect on the Afonydd Cleddau/ Cleddau Rivers SAC and may affect the Pembrokeshire Marine/ Sir Benfro Forol SAC.	Construction: No - no construction required	Operation: Yes - significant effects certain and adverse effects may be unavoidable.

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Tilio-Acerion forests of slopes, screes and ravines		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Bog woodland		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Site / feature not exposed to likely outcomes of option (distance)
Corsydd Eifionydd SAC	10	N	N	
Transition mires and quaking bogs		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	Site / feature not exposed to likely outcomes of option (distance)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Llyn Idwal Ramsar	10	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC	10/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not water-resource sensitive
Mudflats and sandflats not covered by seawater at low tide		0	N	Feature not exposed to hydrological effects
Large shallow inlets and bays		0	N	Feature not exposed to hydrological effects
Reefs		0	N	Feature not exposed to hydrological effects
Submerged or partially submerged sea caves		0	0	Feature not water-resource sensitive
Y Twyni o Abermenai i Aberffraw/ Abermenai to Aberffraw Dunes SAC	11	N	N	
Embryonic shifting dunes		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Humid dune slacks		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Petalwort Petalophyllum ralfsii		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Shore dock Rumex rupestris		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Glannau Môn: Cors heli / Anglesey Coast: Saltmarsh SAC	13	N	N	
Estuaries		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Mudflats and sandflats not covered by seawater at low tide		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Salicornia and other annuals colonizing mud and sand		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Anglesey Terns / Morwenoliaid Ynys Môn SPA	18	N	N	
Sandwich tern Sterna sandvicensis		0	0	Feature not exposed or sensitive
Roseate tern Sterna dougallii		0	0	Feature not exposed or sensitive
Common tern Sterna hirundo		0	0	Feature not exposed or sensitive
Arctic tern Sterna paradisaea		0	0	Feature not exposed or sensitive
Glan-traeth SAC	18	N	N	
Great crested newt Triturus cristatus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Northern Cardigan Bay / Gogledd Bae Ceredigion SPA	18	N	N	
Red-throated diver Gavia stellata		0	0	Feature not exposed or sensitive
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC	18	N	N	

8001-2

Removal of Llyn Cwellyn 10 Ml/d abstraction limit

Option Summary

The drought permit involves the relaxation of the low lake level abstraction rate at Llyn Cwellyn. When lake levels have fallen below 0.8m below spillway and the daily abstraction rate has reduced to 10Ml/d in the current licence conditions, the drought option proposes to operate the abstraction at a daily rate of 12Ml/d. The lake level at which abstraction ceases would be maintained as per the current licence conditions of 2.6m below spillway during the period 16 September to 15 November and 2.0m below spillway at all other times. Compensation releases would be maintained as per the current licence conditions of 11.4Ml/d when lake level is between 0.8m and 2.6m below spillway. Freshet releases would not be impacted by the drought option. The period of implementation for this drought order is likely to be May to October, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

The Afon Gwyrfai a Llyn Cwellyn SAC will be directly affected by the scheme, although these effects will be negligible. The operation of the scheme will maintain compensation releases to the Afon Gwyrfai and freshet releases would not be impacted. The maintenance of the compensation release will ensure that that the Afon Gwyrfai is protected during any drought period and the interest features of the lake (Oligotrophic to mesotrophic standing waters; and Floating Water Plantain) are likely to be reasonably resilient to fluctuating levels, particularly given the normal range of lake levels due to abstraction, and the overall depth of the lake. The scheme would result in a small additional drawdown of the lake (~1%) but this is not considered significant.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Afon Gwyrfai a Llyn Cwellyn SAC	0/DS	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	N	Option will affect reservoir levels, but this will be minimal and will not result in significant additional effects on this feature
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	N	Feature safeguarded by operation of scheme
Atlantic salmon Salmo salar		0	N	Feature safeguarded by operation of scheme
Otter Lutra lutra		0	N	Not likely to be sensitive to scheme outcomes
Floating water-plantain Luronium natans		0	N	Option will affect reservoir levels, but this will be minimal and will not result in significant additional effects on this feature
Glynllifon SAC	2	N	N	
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive to likely outcomes of option
Eryri/ Snowdonia SAC	3	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Alpine and Boreal heaths		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Siliceous alpine and boreal grasslands		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Alpine and subalpine calcareous grasslands		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Depressions on peat substrates of the Rhynchosporion		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Petrifying springs with tufa formation (Cratoneurion)		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Alpine pioneer formations of the Caricion bicoloris-atrofuscae		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Calcareous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Siliceous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Site / feature not exposed to likely outcomes of option (site upstream)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (feature in separate catchment)
Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	8	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Sandbanks which are slightly covered by sea water all the time		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Estuaries		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Mudflats and sandflats not covered by seawater at low tide		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Coastal lagoons		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Large shallow inlets and bays		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Reefs		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Salicornia and other annuals colonizing mud and sand		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Submerged or partially submerged sea caves		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Bottlenose dolphin Tursiops truncatus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Otter Lutra lutra		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Grey seal Halichoerus grypus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Traeth Lafan/ Lavan Sands, Conway Bay SPA	18	N	N	
Great crested grebe Podiceps cristatus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Red-breasted merganser Mergus serrator		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Eurasian oystercatcher Haematopus ostralegus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Eurasian curlew Numenius arquata		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Common redshank Tringa totanus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Coedydd Aber SAC	20	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Morfa Harlech a Morfa Dyffryn SAC	20	N	N	
Embryonic shifting dunes		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Humid dune slacks		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Petalwort Petalophyllum ralfsii		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)

8001-3

Reduction of Alaw Compensation Water

Option Summary

The drought permit involves a proposed reduction in the statutory compensation release from Alaw Reservoir to the Afon Alaw of 1.5Ml/d, from 3.2Ml/d to 1.7Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The drought permit scheme will influence the downstream Afon Alaw from the outflow at Alaw Reservoir to the tidal limit. The period of implementation for this drought permit is likely to be July to December, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

No construction is required for this option. The operation of the scheme will influence the Afon Alaw from the outflow at Alaw Reservoir to the tidal limit at Llanfachraeth, which marks the boundary with the Anglesey Terns / Morwenoliaid Ynys Môn SPA. The Afon Alaw ultimately drains to Beddmanach Bay, which is partly covered by the North Anglesey Marine / Gogledd Môn Forol SCI. The hydrological impacts will end at the tidal limit (i.e. where the Anglesey Terns / Morwenoliaid Ynys Môn SPA begins); very localised short-term effects on water-resource sensitive habitat features within the estuary are conceivable, although in practice the small-scale of any changes and the extremely limited exposure and sensitivity of the interest features (tern species) will ensure that effects are 'not significant' alone.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Anglesey Terns / Morwenoliaid Ynys Môn SPA	7/DS	N	N	
Sandwich tern Sterna sandvicensis		0	N	Site theoretically exposed to operation, but any effects extremely local and feature not particularly sensitive
Roseate tern Sterna dougallii		0	N	Site theoretically exposed to operation, but any effects extremely local and feature not particularly sensitive
Common tern Sterna hirundo		0	N	Site theoretically exposed to operation, but any effects extremely local and feature not particularly sensitive
Arctic tern Sterna paradisaea		0	N	Site theoretically exposed to operation, but any effects extremely local and feature not particularly sensitive
Bae Cemlyn/ Cemlyn Bay SAC	9	N	N	
Coastal lagoons		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Perennial vegetation of stony banks		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Corsydd Môn a Llyn/ Anglesey and Llyn Fens Ramsar	9	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Corsydd Môn/ Anglesey Fens SAC	9	N	N	
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Calcareous fens with Cladium mariscus and species of the Caricion davallianae		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Geyer`s whorl snail Vertigo geyeri		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Southern damselfly Coenagrion mercuriale		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Llyn Dinam SAC	10	N	N	
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Liverpool Bay / Bae Lerpwl SPA	12	N	N	
Red-throated diver Gavia stellata		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Black (common) scoter Melanitta nigra		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Little gull Larus minutus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Common tern Sterna hirundo		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Little tern Sterna albifrons		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Waterbird assemblage		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Waterfowl assemblage		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Glannau Ynys Gybi/ Holy Island Coast SPA	13	N	N	
Red-billed chough Pyrrhocorax pyrrhocorax		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC	13	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Mudflats and sandflats not covered by seawater at low tide		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Large shallow inlets and bays		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Reefs		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Submerged or partially submerged sea caves		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Glannau Ynys Gybi/ Holy Island Coast SAC	14	N	N	
Vegetated sea cliffs of the Atlantic and Baltic Coasts		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Y Twyni o Abermenai i Aberffraw/ Abermenai to Aberffraw Dunes SAC	15	N	N	
Embryonic shifting dunes		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Humid dune slacks		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Petalwort Petalophyllum ralfsii		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Shore dock Rumex rupestris		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Glannau Môn: Cors heli / Anglesey Coast: Saltmarsh SAC	16	N	N	
Estuaries		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Mudflats and sandflats not covered by seawater at low tide		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Salicornia and other annuals colonizing mud and sand		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Glan-traeth SAC	19	N	N	
Great crested newt Triturus cristatus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)

8001-4

Reduction of Ffynnon Llugwy Compensation Water

Option Summary

The drought permit involves a proposed reduction in the compensation flow release from Ffynnon Llugwy to the Afon Llugwy from 4.5Ml/d to 2.5Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The period of implementation for this drought permit is likely to be July to December, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

No construction is required for this option. This will affect the Afon Llugwy for approximately 1.5 km (as far as the Llyn Cowlyd stream capture leat, and potentially further downstream depending on the abstraction and compensation arrangements at the leat). No additional infrastructure would be required to enable this option to be implemented. The scheme will affect the Ffynnon Llugwy reservoir although this will largely be neutral or positive as water levels will be maintained for longer that if the DP were not in operation; the limnal features of the Eryri SAC are not thought to be present in this lake, based on the Management Plan, but would not be adversely affected if present. The Afon Llugwy will be affected by the operation of the scheme and is partially within the SAC, although none of the SAC interest features are dependent on maintenance of flows within the river, and so significant effects would not occur. The ultimate downstream receptor for this option is the Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC, to which the Afon Llugwy flows via the Afon Conwy; however, the operation of the option will have negligible hydrological effects beyond Capel Curig, and any changes would be effectively undetectable at the SAC; on this basis, as effects at the SAC will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Eryri/ Snowdonia SAC	0	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	N	Unclear if Llyn Llugwy supports feature, but operational effects will be neutral or positive
Northern Atlantic wet heaths with Erica tetralix		0	0	Feature not exposed or sensitive to likely outcomes of option
European dry heaths		0	0	Feature not exposed or sensitive to likely outcomes of option
Alpine and Boreal heaths		0	0	Feature not exposed or sensitive to likely outcomes of option
Siliceous alpine and boreal grasslands		0	0	Feature not exposed or sensitive to likely outcomes of option
Alpine and subalpine calcareous grasslands		0	0	Feature not exposed or sensitive to likely outcomes of option
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe		0	0	Feature not exposed or sensitive to likely outcomes of option
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	Feature not exposed or sensitive to likely outcomes of option
Blanket bogs (* if active bog)		0	0	Feature not exposed or sensitive to likely outcomes of option
Depressions on peat substrates of the Rhynchosporion		0	0	Feature not exposed or sensitive to likely outcomes of option
Petrifying springs with tufa formation (Cratoneurion)		0	0	Feature not exposed or sensitive to likely outcomes of option
Alkaline fens		0	0	Feature not exposed or sensitive to likely outcomes of option
Alpine pioneer formations of the Caricion bicoloris-atrofuscae		0	0	Feature not exposed or sensitive to likely outcomes of option
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	Feature not exposed or sensitive to likely outcomes of option
Calcareous rocky slopes with chasmophytic vegetation		0	0	Feature not exposed or sensitive to likely outcomes of option
Siliceous rocky slopes with chasmophytic vegetation		0	0	Feature not exposed or sensitive to likely outcomes of option
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Feature not exposed or sensitive to likely outcomes of option
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Feature not exposed or sensitive to likely outcomes of option
Floating water-plantain Luronium natans		0	0	Unclear if Llyn Llugwy supports feature, but operational effects will be neutral or positive
Llyn Idwal Ramsar	5	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Feature not exposed to likely outcomes of option
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities		0	0	Feature not exposed to likely outcomes of option
Coedydd Aber SAC	7	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Mwyngloddiau Fforest Gwydir/ Gwydyr Forest Mines SAC	7	N	N	
Calaminarian grasslands of the Violetalia calaminariae		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive to likely outcomes of option

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	9	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
European dry heaths		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Tilio-Acerion forests of slopes, screes and ravines		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Bog woodland		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive to likely outcomes of option
Traeth Lafan/ Lavan Sands, Conway Bay SPA	12/DS	N	N	
Great crested grebe Podiceps cristatus		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Red-breasted merganser Mergus serrator		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Eurasian oystercatcher Haematopus ostralegus		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Eurasian curlew Numenius arquata		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Common redshank Tringa totanus		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC	12/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not water-resource sensitive
Mudflats and sandflats not covered by seawater at low tide		0	N	Downstream receptor but effects negligible at site boundary
Large shallow inlets and bays		0	N	Downstream receptor but effects negligible at site boundary
Reefs		0	N	Downstream receptor but effects negligible at site boundary
Submerged or partially submerged sea caves		0	0	Feature not water-resource sensitive
Afon Gwyrfai a Llyn Cwellyn SAC	13	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Atlantic salmon Salmo salar		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Otter Lutra lutra		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Liverpool Bay / Bae Lerpwl SPA	13	N	N	
Red-throated diver Gavia stellata		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Black (common) scoter Melanitta nigra		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Little gull Larus minutus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Common tern Sterna hirundo		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Little tern Sterna albifrons		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Waterbird assemblage		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Waterfowl assemblage		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Migneint-Arenig-Ddualt SAC	16	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Natural dystrophic lakes and ponds		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Migneint-Arenig-Ddualt SPA	16	N	N	
Hen harrier Circus cyaneus		0	0	Feature not sensitive to likely outcomes of option

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Merlin Falco columbarius		0	0	Feature not sensitive to likely outcomes of option
Peregrine falcon Falco peregrinus		0	0	Feature not sensitive to likely outcomes of option
Glynllifon SAC	18	N	N	
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive to likely outcomes of option
Anglesey Terns / Morwenoliaid Ynys Môn SPA	19	N	N	
Sandwich tern Sterna sandvicensis		0	0	Site / feature not exposed / sensitive to likely outcomes of option
Roseate tern Sterna dougallii		0	0	Site / feature not exposed / sensitive to likely outcomes of option
Common tern Sterna hirundo		0	0	Site / feature not exposed / sensitive to likely outcomes of option
Arctic tern Sterna paradisaea		0	0	Site / feature not exposed / sensitive to likely outcomes of option
Coedwigoedd Penrhyn Creuddyn/ Creuddyn Peninsula Woods SAC	19	N	N	
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid site		0	0	Site / feature not exposed / sensitive to likely outcomes of option
Tilio-Acerion forests of slopes, screes and ravines		0	0	Site / feature not exposed / sensitive to likely outcomes of option
Taxus baccata woods of the British Isles		0	0	Site / feature not exposed / sensitive to likely outcomes of option
Ynys Seiriol / Puffin Island SPA	19	N	N	
Great cormorant Phalacrocorax carbo		0	0	Site / feature not exposed to likely outcomes of option

8001-5

Reduction of Cefni Reservoir Compensation Water

Option Summary

The drought permit involves a proposed reduction in the statutory compensation release from Cefni Reservoir to the Afon Cefni of 0.9Ml/d, from 1.8Ml/d to 0.9Ml/d.

The period of implementation for this drought permit is likely to be July to December, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

No construction is required for this option. The scheme will influence the downstream Afon Cefni from the outflow at Cefni Reservoir to the tidal limit, and may affect effluent dilution from Llangefni WTW which discharges into the Afon Cefni approximately 4 km downstream of the compensation discharge point. The option would make use of existing infrastructure and would not require construction of new infrastructure. The ultimate downstream receptor for this option is the Anglesey Terns / Morwenoliaid Ynys Môn SPA, which covers the estuary of the Afon Cefni, and the Glannau Môn: Cors heli / Anglesey Coast: Saltmarsh SAC (boundary of all sites at Pont Malltraeth). However, the operation of the option will only affect the Afon Cefni to the tidal limit (at Pont Bulkeley, approximately 6.5km upstream of Pont Malltraeth) and hydrological changes would be effectively nil at the site boundaries; in addition, the features of these sites will not be particularly sensitive or exposed to any effects. On this basis no significant effects will occur. In addition, as effects at the SAC / SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Corsydd Môn/ Anglesey Fens SAC	3	N	N	
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Calcareous fens with Cladium mariscus and species of the Caricion davallianae		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Geyer`s whorl snail Vertigo geyeri		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Southern damselfly Coenagrion mercuriale		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	Site / feature not exposed to likely outcomes of option (distance, low dispersal range)
Corsydd Môn a Llyn/ Anglesey and Llyn Fens Ramsar	4	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Anglesey Terns / Morwenoliaid Ynys Môn SPA	8/DS	N	N	
Sandwich tern Sterna sandvicensis		0	N	Feature not sensitive to likely changes; very limited exposure
Roseate tern Sterna dougallii		0	N	Feature not sensitive to likely changes; very limited exposure
Common tern Sterna hirundo		0	N	Feature not sensitive to likely changes; very limited exposure
Arctic tern Sterna paradisaea		0	N	Feature not sensitive to likely changes; very limited exposure
Y Twyni o Abermenai i Aberffraw/ Abermenai to Aberffraw Dunes SAC	9	N	N	
Embryonic shifting dunes		0	0	Feature not sensitive to likely changes; very limited exposure
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	Feature not sensitive to likely changes; very limited exposure
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	Feature not sensitive to likely changes; very limited exposure
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	Feature not sensitive to likely changes; very limited exposure
Humid dune slacks		0	0	Feature not sensitive to likely changes; very limited exposure
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Petalwort Petalophyllum ralfsii		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Shore dock Rumex rupestris		0	0	Feature not exposed to likely outcomes of option (distance, separate catchment)
Glannau Môn: Cors heli / Anglesey Coast: Saltmarsh SAC	9/DS	N	N	
Estuaries		0	N	No hydrological effects expected beyond tidal limit; feature not exposed to potentially significant effects
Mudflats and sandflats not covered by seawater at low tide		0	N	No hydrological effects expected beyond tidal limit; feature not exposed to potentially significant effects
Salicornia and other annuals colonizing mud and sand		0	N	No hydrological effects expected beyond tidal limit; feature not exposed to potentially significant effects

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	N	No hydrological effects expected beyond tidal limit; feature not exposed to potentially significant effects
Liverpool Bay / Bae Lerpwl SPA	10	N	N	
Red-throated diver Gavia stellata		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Black (common) scoter Melanitta nigra		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Little gull Larus minutus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Common tern Sterna hirundo		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Little tern Sterna albifrons		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Waterbird assemblage		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Waterfowl assemblage		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC	10	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Mudflats and sandflats not covered by seawater at low tide		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Large shallow inlets and bays		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Reefs		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Submerged or partially submerged sea caves		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Glan-traeth SAC	11	N	N	
Great crested newt Triturus cristatus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Llyn Dinam SAC	13	N	N	
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Traeth Lafan/ Lavan Sands, Conway Bay SPA	15	N	N	
Great crested grebe Podiceps cristatus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Red-breasted merganser Mergus serrator		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Eurasian oystercatcher Haematopus ostralegus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Eurasian curlew Numenius arquata		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Common redshank Tringa totanus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Glannau Ynys Gybi/ Holy Island Coast SPA	16	N	N	
Red-billed chough Pyrrhocorax pyrrhocorax		0	0	Site / feature not sensitive to likely outcomes of option
Afon Gwyrfai a Llyn Cwellyn SAC	17	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Atlantic salmon Salmo salar		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Otter Lutra lutra		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Eryri/ Snowdonia SAC	18	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Alpine and Boreal heaths		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Siliceous alpine and boreal grasslands		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Alpine and subalpine calcareous grasslands		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Petrifying springs with tufa formation (Cratoneurion)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Alpine pioneer formations of the Caricion bicoloris-atrofuscae		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Calcareous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Siliceous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Bae Cemlyn/ Cemlyn Bay SAC	19	N	N	
Coastal lagoons		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)
Perennial vegetation of stony banks		0	0	Site / feature not exposed to likely outcomes of option (distance, separate catchment)

8012-2

Reduction of the regulation release from Aled Isaf and modification of the Hands Off Flow value at Bryn Aled

Option Summary

The drought permit involves a proposed reduction of 2Ml/d in the regulation release rate from Aled Isaf Reservoir whenever abstraction is taking place and residual flow at Bryn Aled is below 29.5Ml/d. This would conserve the longevity of total reservoir storage for regulation releases to the Afon Aled for abstraction at the Bryn Aled intake. Drought actions and any future application for a drought permit would be managed by the Aled and Clwyd Consultative Group which would be convened under the terms of the Section 20 Operating Agreement with NRW. The period of implementation for this drought order is likely to be September to January, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

No construction is required for this option. The gain in supply will be made by slowing the drawdown of the Aled Reservoirs, enabling the regulation release to be sustained for longer. There would be no adverse impact in the upper reaches of the Afon Aled as the combined regulation and compensation releases would still be in excess of the normal full compensation release. The environmental impact would be to reduce the flows in the Afon Aled below the Bryn Aled abstraction point. The option would not require construction of new infrastructure.

The ultimate downstream receptor for this option is the Liverpool Bay / Bae Lerpwl SPA, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be essentially undetectable at the site boundary; in addition, the features of this site will not be particularly sensitive or exposed to any effects associated with changes in freshwater flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Mwyngloddiau Fforest Gwydir/ Gwydyr Forest Mines SAC	11	N	N	
Calaminarian grasslands of the Violetalia calaminariae		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive likely outcomes of option
Coedwigoedd Dyffryn Elwy/ Elwy Valley Woods SAC	13	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Migneint-Arenig-Ddu allt SAC	13	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanoju		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Natural dystrophic lakes and ponds		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Migneint-Arenig-Ddu allt SPA	13	N	N	
Hen harrier Circus cyaneus		0	0	Feature not sensitive likely outcomes of option
Merlin Falco columbarius		0	0	Feature not sensitive likely outcomes of option
Peregrine falcon Falco peregrinus		0	0	Feature not sensitive likely outcomes of option
Eryri/ Snowdonia SAC	16	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanoju		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine and Boreal heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous alpine and boreal grasslands		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine and subalpine calcareous grasslands		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Petrifying springs with tufa formation (Cratoneurion)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine pioneer formations of the Caricion bicoloris-atrofuscae		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Calcareous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Llwyn SAC	17	N	N	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC	18	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Sea lamprey Petromyzon marinus		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Brook lamprey Lampetra planeri		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
River lamprey Lampetra fluviatilis		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Atlantic salmon Salmo salar		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Bullhead Cottus gobio		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Otter Lutra lutra		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Liverpool Bay / Bae Lerpwl SPA	19/DS	N	N	
Red-throated diver Gavia stellata		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Black (common) scoter Melanitta nigra		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little gull Larus minutus		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Common tern Sterna hirundo		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little tern Sterna albifrons		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Waterbird assemblage		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Waterfowl assemblage		0	N	Hydrological effects at site boundary negligible

8012-4

Relaxation of the annual licences on Afon Aled and the Plas Uchaf and Dolwen Reservoirs

Option Summary

The drought permit involves a relaxing the annual licence conditions on the Bryn Alde intake and Plas Uchaf and Dowlen Reservoir abstraction, to enable Welsh Water to abstract from the Aled catchment at high demands of up to the daily licensed maximum rates, to meet higher than usual demands in drought conditions. The period of implementation for this drought order is likely to be November to March, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

No construction is required for this option. The ultimate downstream receptor for this option is the Liverpool Bay / Bae Lerpwl SPA, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be undetectable at the site boundary; in addition, the features of this sites will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Mwyngloddiau Fforest Gwydir/ Gwydyr Forest Mines SAC	11	N	N	
Calaminarian grasslands of the Violetalia calaminariae		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive likely outcomes of option
Coedwigoedd Dyffryn Elwy/ Elwy Valley Woods SAC	13	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Migneint-Arenig-Ddualllt SAC	13	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Natural dystrophic lakes and ponds		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Migneint-Arenig-Ddualllt SPA	13	N	N	
Hen harrier Circus cyaneus		0	0	Feature not sensitive likely outcomes of option
Merlin Falco columbarius		0	0	Feature not sensitive likely outcomes of option
Peregrine falcon Falco peregrinus		0	0	Feature not sensitive likely outcomes of option
Eryri/ Snowdonia SAC	16	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine and Boreal heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous alpine and boreal grasslands		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine and subalpine calcareous grasslands		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Petrifying springs with tufa formation (Cratoneurion)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine pioneer formations of the Caricion bicoloris-atrofuscae		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Calcareous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Llwyn SAC	17	N	N	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC	18	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Sea lamprey Petromyzon marinus		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Brook lamprey Lampetra planeri		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
River lamprey Lampetra fluviatilis		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Atlantic salmon Salmo salar		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Bullhead Cottus gobio		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Otter Lutra lutra		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Liverpool Bay / Bae Lerpwl SPA	19/DS	N	N	
Red-throated diver Gavia stellata		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Black (common) scoter Melanitta nigra		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little gull Larus minutus		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Common tern Sterna hirundo		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little tern Sterna albifrons		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Waterbird assemblage		0	N	Hydrological effects at site boundary negligible;
Waterfowl assemblage		0	N	Hydrological effects at site boundary negligible

8012-5

Relaxation of the Llannerch boreholes annual licence

Option Summary

The drought permit involves a change in the abstraction licence at Llannerch through a temporary cessation of the annual abstraction rate condition. The maximum daily abstraction rate of 13.64Ml/d would still be applicable. The average daily abstraction that would be permissible within 12 months would be raised by 4.3Ml/d from 9.34Ml/d to 13.64Ml/d. This would provide a modest increase in water resource during a drought and increase the security of supply in the Clwyd Coastal WRZ by assisting post-drought winter refill of the Aled Reservoirs, by reducing demand from that resource. The period of implementation for this drought permit is likely to be September to January, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

The Llanerch boreholes are adjacent to the River Clwyd, which flows to the Liverpool Bay / Bae Lerpwl SPA at Rhyl. The operation of the proposed drought permit will affect local groundwater levels, thus influencing the Afon Clwyd and other watercourses in connectivity through the superficial deposits by reduction of baseflow. However, the drought permit would not alter the licence conditions under which the Clwyd Augmentation Scheme operates and the option will have negligible hydrological effects at the boundary of the SPA. In addition, the features of this site will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Clwyd. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Coedwigoedd Dyffryn Elwy/ Elwy Valley Woods SAC	3	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	Feature not exposed / sensitive to likely effects
Llwyn SAC	7	N	N	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Feature not exposed to likely effects
Halkyn Mountain/ Mynydd Helygain SAC	10	N	N	
European dry heaths		0	0	Feature not exposed / sensitive to likely effects
Calaminarian grasslands of the Violetalia calaminariae		0	0	Feature not exposed / sensitive to likely effects
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid site:		0	0	Feature not exposed / sensitive to likely effects
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	Feature not exposed / sensitive to likely effects
Great crested newt Triturus cristatus		0	0	Feature not exposed / sensitive to likely effects
The Dee Estuary Ramsar	11	N	N	
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities		0	0	Feature not exposed to likely effects
Crit. 5 - regularly supports 20,000 or more waterbirds		0	0	Feature not exposed to likely effects
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		0	0	Feature not exposed to likely effects
The Dee Estuary SPA	11	N	N	
Common shelduck Tadorna tadorna		0	0	Feature not exposed to likely effects
Eurasian teal Anas crecca		0	0	Feature not exposed to likely effects
Northern pintail Anas acuta		0	0	Feature not exposed to likely effects
Eurasian oystercatcher Haematopus ostralegus		0	0	Feature not exposed to likely effects
Grey plover Pluvialis squatarola		0	0	Feature not exposed to likely effects
Red knot Calidris canutus		0	0	Feature not exposed to likely effects
Bar-tailed godwit Limosa lapponica		0	0	Feature not exposed to likely effects
Eurasian curlew Numenius arquata		0	0	Feature not exposed to likely effects
Common redshank Tringa totanus		0	0	Feature not exposed to likely effects
Sandwich tern Sterna sandvicensis		0	0	Feature not exposed to likely effects
Common tern Sterna hirundo		0	0	Feature not exposed to likely effects
Little tern Sterna albifrons		0	0	Feature not exposed to likely effects
Black-tailed godwit Limosa limosa islandica		0	0	Feature not exposed to likely effects
Dunlin Calidris alpina alpina		0	0	Feature not exposed to likely effects
Waterbird assemblage		0	0	Feature not exposed to likely effects

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Liverpool Bay / Bae Lerpwl SPA	11/DS	N	N	
Red-throated diver Gavia stellata		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Black (common) scoter Melanitta nigra		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little gull Larus minutus		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Common tern Sterna hirundo		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little tern Sterna albifrons		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Waterbird assemblage		0	N	Hydrological effects at site boundary negligible;
Waterfowl assemblage		0	N	Hydrological effects at site boundary negligible
Dee Estuary/ Aber Dyfrdwy SAC	12	N	N	
Estuaries		0	0	Feature not exposed to likely effects
Mudflats and sandflats not covered by seawater at low tide		0	0	Feature not exposed to likely effects
Annual vegetation of drift lines		0	0	Feature not exposed to likely effects
Vegetated sea cliffs of the Atlantic and Baltic Coasts		0	0	Feature not exposed to likely effects
Salicornia and other annuals colonizing mud and sand		0	0	Feature not exposed to likely effects
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Feature not exposed to likely effects
Embryonic shifting dunes		0	0	Feature not exposed to likely effects
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	Feature not exposed to likely effects
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	Feature not exposed to likely effects
Humid dune slacks		0	0	Feature not exposed to likely effects
Sea lamprey Petromyzon marinus		0	0	Feature not exposed to likely effects
River lamprey Lampetra fluviatilis		0	0	Feature not exposed to likely effects
Petalwort Petalophyllum ralfsii		0	0	Feature not exposed to likely effects
Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC	14	N	N	
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid site:		0	0	Feature not exposed / sensitive to likely effects
Tilio-Acerion forests of slopes, screes and ravines		0	0	Feature not exposed / sensitive to likely effects
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Feature not exposed / sensitive to likely effects

8012-6

Pumped (winter) refill from Aled Isaf to Llyn Aled

Option Summary

Under the drought permit water from Aled Isaf Reservoir would be pumped up to Llyn Aled Reservoir to support refill. Such usage is not authorised by the existing abstraction licence and a drought permit would be required. Daily pumping rates have not been specified at this stage and so the assessment is based on an assumed transfer rate of 19.5Ml/d. Drought actions and any future application for a drought permit would be managed by the Aled Consultative Group which would be convened under the terms of the Section 20 Operating Agreement with NRW. The drought permit is most likely to occur during the autumn and winter period and is considered unlikely to extend outside the period November to February. This has been confirmed by Welsh Water's water resources modelling and understanding of operating the assets. It is assumed however that temporary pumping equipment and overground pipeline will be required to actively transfer water storage against the topographic gradient for approximately 1km from

General Assessment

This option is linked to Option 8012-4, where the dead storage in Llyn Aled is accessed. Llyn Aled has a small catchment so would take an extended period of time to refill;this option utilises the more rapid refill of Aled Isaf to support the refill of Llyn Aled through pumping of water from Aled Isaf back up to Llyn Aled.

It is assumed however that temporary pumping equipment and overground pipeline will be required to actively transfer water storage against the topographic gradient for approximately 1km from Aled Isaf to Llyn Aled.

The ultimate downstream receptor for this option is the Liverpool Bay / Bae Lerpwl SPA, which covers the offshore areas at Rhyl. However, the operation of the option will have no notable effects on flows from the confluence of the Afon Aled and the larger Afon Elwy, and hydrological changes would be undetectable at the site boundary; in addition, the features of this sites will not be particularly sensitive or exposed to any effects associated with changes in flows from the Afon Elwy. On this basis no significant effects will occur. In addition, as effects at the SPA boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans. Construction of the scheme will not affect any European sites or features.

Significant effects?

Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Migneint-Arenig-Dduallt SAC	11	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Natural dystrophic lakes and ponds		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Migneint-Arenig-Dduallt SPA	11	N	N	
Hen harrier Circus cyaneus		0	0	Feature not sensitive likely outcomes of option
Merlin Falco columbarius		0	0	Feature not sensitive likely outcomes of option
Peregrine falcon Falco peregrinus		0	0	Feature not sensitive likely outcomes of option
Mwyngloddiau Fforest Gwydir/ Gwydyr Forest Mines SAC	11	N	N	
Calaminarian grasslands of the Violetalia calaminariae		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive likely outcomes of option
Coedwigoedd Dyffryn Elwy/ Elwy Valley Woods SAC	15	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	Feature not exposed / sensitive to likely effects
Eryri/ Snowdonia SAC	16	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine and Boreal heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous alpine and boreal grasslands		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine and subalpine calcareous grasslands		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Petrifying springs with tufa formation (Cratoneurion)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine pioneer formations of the Caricion bicoloris-atrofuscae		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Calcareous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC	16	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Sea lamprey Petromyzon marinus		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Brook lamprey Lampetra planeri		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
River lamprey Lampetra fluviatilis		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Atlantic salmon Salmo salar		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Bullhead Cottus gobio		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Otter Lutra lutra		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Llwyn SAC	18	N	N	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Feature not exposed to likely effects
Liverpool Bay / Bae Lerpwl SPA	19/DS	N	N	
Red-throated diver Gavia stellata		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Black (common) scoter Melanitta nigra		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little gull Larus minutus		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Common tern Sterna hirundo		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Little tern Sterna albifrons		0	N	Hydrological effects at site boundary negligible; feature not sensitive
Waterbird assemblage		0	N	Hydrological effects at site boundary negligible;
Waterfowl assemblage		0	N	Hydrological effects at site boundary negligible

8021-1

Tankering raw water from Dysynni

Option Summary

The proposed drought permit would involve a daily abstraction of up to 0.44Ml/d from a temporary river abstraction intake located upstream of the Pont y Garth gauging station on the Afon Dysynni. The temporary intake is likely to be at a Natural Resources Wales Depot (NGR: SH635070). Appropriate screening for eels and salmonids will be provided at the abstraction intake which complies with the Eels (England and Wales) Regulations 2009. Suitable additional hardstanding for tankers would be provided at the selected location if required and the water abstracted would be transferred by tanker to the water treatment works at Penybont.

General Assessment

The Afon Dysynni ultimately flows to the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC; however, operational effects will not occur as the hydrological effects are predicted to be negligible beyond the confluence of the Dysynni with the Afon Fathew, which is just above the tidal limit and approximately 4.3km upstream of the SAC boundary. A temporary abstraction of 0.44Ml/d from the Afon Dysynni at the NRW depot would represent a 1% reduction in summer low flows and a 1.7% reduction in summer extreme low flows. The hydrological impact of this drought permit option is therefore considered to be negligible. Construction requirements are uncertain but will be very localised and minor and there is no possibility of these works affecting either the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC (distance, natural attenuation) or the features of the Craig yr Aderyn (Bird`s Rock) SPA (chough are generally tolerant of activities away from their nests and foraging areas, and any construction would be over 600m from the edge of the SPA). Therefore, significant effects will not occur.

Significant effects?

Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Craig yr Aderyn (Bird`s Rock) SPA	0.6	N	N	
Red-billed chough Pyrrhocorax pyrrhocorax		N	0	Minor construction only; feature unlikely to be sensitive / exposed to effects
Cadair Idris SAC	4	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alkaline fens		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Calcareous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Siliceous rocky slopes with chasmophytic vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC	5/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	N	Feature not sensitive
Estuaries		0	N	Negligible effects on flows in Dysynni predicted; feature not exposed
Mudflats and sandflats not covered by seawater at low tide		0	N	Negligible effects on flows in Dysynni predicted; feature not exposed
Coastal lagoons		0	N	Negligible effects on flows in Dysynni predicted; feature not exposed
Large shallow inlets and bays		0	N	Negligible effects on flows in Dysynni predicted; feature not exposed
Reefs		0	N	Negligible effects on flows in Dysynni predicted; feature not exposed
Salicornia and other annuals colonizing mud and sand		0	N	Negligible effects on flows in Dysynni predicted; feature not exposed
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	N	Negligible effects on flows in Dysynni predicted; feature not exposed
Submerged or partially submerged sea caves		0	N	Feature not sensitive

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Bottlenose dolphin Tursiops truncatus		0	N	Feature not sensitive
Otter Lutra lutra		0	N	Negligible effects on flows in Dysynni predicted; feature not sensitive to magnitude of change
Grey seal Halichoerus grypus		0	N	Feature not sensitive
Northern Cardigan Bay / Gogledd Bae Ceredigion SPA	6/DS	N	N	
Red-throated diver Gavia stellata		0	0	Feature not sensitive
Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	7	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Tilio-Acerion forests of slopes, screes and ravines		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Bog woodland		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Cors Fochno and Dyfi Ramsar	10	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Dyfi Estuary / Aber Dyfi SPA	10	N	N	
Greenland white-fronted goose Anser albifrons flavirostris		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Coed Cwm Einion SAC	13	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Cors Fochno SAC	14	N	N	
Active raised bogs		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Degraded raised bogs still capable of natural regeneration		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Afon Eden - Cors Goch Trawsfynydd SAC	15	N	N	
Active raised bogs		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Freshwater pearl mussel Margaritifera margaritifera		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Atlantic salmon Salmo salar		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Otter Lutra lutra		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Morfa Harlech a Morfa Dyffryn SAC	16	N	N	
Embryonic shifting dunes		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Humid dune slacks		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Petalwort Petalophyllum ralfsii		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Rhinog SAC	18	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
European dry heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Alpine and Boreal heaths		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Blanket bogs (* if active bog)		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Floating water-plantain Luronium natans		0	0	Site / feature not exposed to likely outcomes of option (separate catchment)

8033-2

Reduce compensation water releases from Llyn Bodlyn

Option Summary

The drought order involves a proposed reduction in the statutory compensation flow release from Llyn Bodlyn to the Afon Ysgethin by 1 Ml/d, from 2.18 Ml/d to 1.18 Ml/d. This will conserve reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. the period of implementation for this drought order is likely to be July to October, as confirmed by water resources modelling carried out by Welsh Water

General Assessment

The option will potentially influence the downstream Afon Ysgethin. The timing of the reduction in the compensation release is most likely to occur during the late summer/early autumn period. This is based on modelling of the Llyn Bodlyn performance under normal operating conditions in dry summers, together with experience of operating the source. No new infrastructure would be required for this option. The Ysgethin flows to the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC via the Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC. The option will result in reductions of up to 16% in river flows in Reach 2 (i.e. to the tidal limit) with corresponding reductions in wetted depths/wetted widths (potential marginal habitats) during the summer and autumn period. However, the hydrological effects of the scheme on the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC are considered negligible. As the features of the SAC are almost exclusively marine (with the exception of Otter), their sensitivity to the minor variations in freshwater input associated with the option will generally be low; and the habitat features are largely located some distance from the Ysgethin (the closest habitat feature, based on NRW mapping data, is the Sarn Badrig sub-tidal shingle ridge which contributes to the Reefs feature although this is several hundred metres offshore). Consequently, the marine features of the SAC will not be significantly affected by the option. With regard to Otter, it is arguable that the watercourses draining to the SAC are 'functional habitat' for this species; however, the species is not particularly sensitive to the expected changes and the Ysgethin is one of a large number of streams and rivers entering the SAC, most of which will be equally suitable for otters and unaffected by the operation of any drought orders, and there is nothing to suggest that the Ysgethin is disproportionately important to the otter population of the SAC. None of the principal water resource sensitive interest features of the Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC are present in the Afon Ysgethin or the Coed-y-Gadol woodlands, although the some of the 'typical species' associated with the woodland features may have a small sensitivity to changes in splash zones and so significant effects are possible for this feature.

Significant effects?

Construction: No - no construction required

Operation: Uncertain - effect pathway present but effects likely to be minimal; appropriate assessment likely to confirm effects will not be significant.

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Rhinog SAC	I	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Alpine and Boreal heaths		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways
Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	2/DS	N	U	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	Feature not present in Afon Ysgethin based on management plan
Northern Atlantic wet heaths with Erica tetralix		0	0	Feature not present in Afon Ysgethin based on management plan
European dry heaths		0	0	Feature not present in Afon Ysgethin based on management plan
Tilio-Acerion forests of slopes, screes and ravines		0	0	Feature not present in Afon Ysgethin based on management plan
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	U	Feature not sensitive to WR permissions but splash zone changes might affect typical species
Bog woodland		0	0	Feature not present in Afon Ysgethin based on management plan
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	Feature not present in Afon Ysgethin based on management plan
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC	5/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not sensitive
Estuaries		0	0	Feature not exposed based on management plan (location)
Mudflats and sandflats not covered by seawater at low tide		0	N	Present at outflow of Ysgethin but minor feature unlikely to be sensitive to predicted changes
Coastal lagoons		0	0	Feature not exposed based on management plan (location)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Large shallow inlets and bays		0	0	Feature not exposed based on management plan (location)
Reefs		0	N	Feature present offshore from Tal-y-Bont but unlikely to be sensitive to predicted changes
Salicornia and other annuals colonizing mud and sand		0	0	Feature not exposed based on management plan (location)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Feature not exposed based on management plan (location)
Submerged or partially submerged sea caves		0	0	Feature not sensitive to WR permissions
Bottlenose dolphin Tursiops truncatus		0	0	Feature not sensitive to WR permissions
Otter Lutra lutra		0	N	Feature only weakly sensitive
Grey seal Halichoerus grypus		0	0	Feature not sensitive to WR permissions
Northern Cardigan Bay / Gogledd Bae Ceredigion SPA	7	N	N	
Red-throated diver Gavia stellata		0	0	Feature not sensitive
Morfa Harlech a Morfa Dyffryn SAC	7/DS	N	N	
Embryonic shifting dunes		0	0	Feature not sensitive to WR permissions
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	Feature not sensitive to WR permissions
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	Feature not exposed to hydrological changes (location within SAC)
Humid dune slacks		0	0	Feature not exposed to hydrological changes (location within SAC)
Petalwort Petalophyllum ralfsii		0	0	Feature not exposed to hydrological changes (location within SAC)
Afon Eden - Cors Goch Trawsfynydd SAC	8	N	N	
Active raised bogs		0	0	No effect pathways
Freshwater pearl mussel Margaritifera margaritifera		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways
Cadair Idris SAC	10	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	No effect pathways
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Siliceous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways
Migneint-Arenig-Ddualt SAC	15	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways
Natural dystrophic lakes and ponds		0	0	No effect pathways
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Migneint-Arenig-Ddualt SPA	15	N	N	

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Hen harrier Circus cyaneus		0	0	No effect pathways
Merlin Falco columbarius		0	0	No effect pathways
Peregrine falcon Falco peregrinus		0	0	No effect pathways
Craig yr Aderyn (Bird`s Rock) SPA	16	N	N	
Red-billed chough Pyrrhocorax pyrrhocorax		0	0	No effect pathways

8034-1

Afon Dwyfor Drought Permit

Option Summary

The drought permit involves a temporary increase of 1Ml/d in the daily abstraction rate at the Garndolbenmaen intake, without a corresponding increase in the daily regulation release rate from Llyn Cwmystradllyn when flow at Dolbenmaen weir is below the seasonal flow constraint limit. This would enable Welsh Water to reduce their direct abstraction from Llyn Cwmystradllyn by 1Ml/d and thus conserve reservoir storage for later use for river regulation and/or direct supply during a drought. This drought permit will potentially influence the Afon Henwy from Llyn Cwmystradllyn to the Afon Dwyfor confluence, and the Afon Dwyfor downstream to the tidal limit. The period of implementation for this drought order is likely to be September to January, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

The Afon Henwy flows to the Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC via the Afon Dwyfor. As noted, the option will influence the Afon Henwy from Llyn Cwmystradllyn to the Afon Dwyfor confluence, with negligible hydrological impact on the Afon Dwyfor downstream to the tidal limit. Whilst some SAC features around the Dwyfor estuary (~2km downstream of the tidal limit) might be theoretically exposed to the operation of the scheme, as the hydrological impacts will be effectively nil below the tidal limit it is concluded that no significant effects will occur.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC	3	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways (separate catchment)
European dry heaths		0	0	No effect pathways (separate catchment)
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways (separate catchment)
Bog woodland		0	0	No effect pathways (separate catchment)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways (separate catchment)
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Corsydd Eifionydd SAC	6	N	N	
Transition mires and quaking bogs		0	0	No effect pathways (separate catchment)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	Feature not exposed (distance)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways (separate catchment)
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC	6/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not sensitive
Estuaries		0	N	Hydrological effects negligible at tidal limit; effect on feature negligible and not significant
Mudflats and sandflats not covered by seawater at low tide		0	N	Hydrological effects negligible at tidal limit; effect on feature negligible and not significant
Coastal lagoons		0	0	Feature not exposed (location)
Large shallow inlets and bays		0	N	Hydrological effects negligible at tidal limit; effect on feature negligible and not significant
Reefs		0	0	Feature not exposed (location)
Salicornia and other annuals colonizing mud and sand		0	0	Feature not exposed (location)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Feature not exposed (location)
Submerged or partially submerged sea caves		0	0	Feature not sensitive
Bottlenose dolphin Tursiops truncatus		0	0	Feature not sensitive
Otter Lutra lutra		0	N	Feature only weakly sensitive; effect on feature negligible and not significant
Grey seal Halichoerus grypus		0	0	Feature not sensitive
Eryri/ Snowdonia SAC	7	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
European dry heaths		0	0	No effect pathways (separate catchment)
Alpine and Boreal heaths		0	0	No effect pathways (separate catchment)
Siliceous alpine and boreal grasslands		0	0	No effect pathways (separate catchment)
Alpine and subalpine calcareous grasslands		0	0	No effect pathways (separate catchment)
Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe		0	0	No effect pathways (separate catchment)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	No effect pathways (separate catchment)
Blanket bogs (* if active bog)		0	0	No effect pathways (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways (separate catchment)
Petrifying springs with tufa formation (Cratoneurion)		0	0	No effect pathways (separate catchment)
Alkaline fens		0	0	No effect pathways (separate catchment)
Alpine pioneer formations of the Caricion bicoloris-atrofuscae		0	0	No effect pathways (separate catchment)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)		0	0	No effect pathways (separate catchment)
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways (separate catchment)
Siliceous rocky slopes with chasmophytic vegetation		0	0	No effect pathways (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways (separate catchment)
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways (separate catchment)
Floating water-plantain Luronium natans		0	0	No effect pathways (separate catchment)
Afon Gwyrfai a Llyn Cwellyn SAC	8	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways (separate catchment)
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways (separate catchment)
Atlantic salmon Salmo salar		0	0	No effect pathways (separate catchment)
Otter Lutra lutra		0	0	No effect pathways (separate catchment)
Floating water-plantain Luronium natans		0	0	No effect pathways (separate catchment)
Morfa Harlech a Morfa Dyffryn SAC	8	N	N	
Embryonic shifting dunes		0	0	No effect pathways (separate catchment)
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	No effect pathways (separate catchment)
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	No effect pathways (separate catchment)
Humid dune slacks		0	0	No effect pathways (separate catchment)
Petalwort Petalophyllum ralfsii		0	0	No effect pathways (separate catchment)
Northern Cardigan Bay / Gogledd Bae Ceredigion SPA	8/DS	N	N	
Red-throated diver Gavia stellata		0	0	Feature not exposed / sensitive to likely changes
Glynllifon SAC	9	N	N	
Lesser horseshoe bat Rhinolophus hipposideros		0	0	No effect pathways (separate catchment)
Rhinog SAC	13	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways (separate catchment)
European dry heaths		0	0	No effect pathways (separate catchment)
Alpine and Boreal heaths		0	0	No effect pathways (separate catchment)
Blanket bogs (* if active bog)		0	0	No effect pathways (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways (separate catchment)
Floating water-plantain Luronium natans		0	0	No effect pathways (separate catchment)
Migneint-Arenig-Ddualllt SAC	15	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Natural dystrophic lakes and ponds		0	0	No effect pathways (separate catchment)
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways (separate catchment)
European dry heaths		0	0	No effect pathways (separate catchment)
Blanket bogs (* if active bog)		0	0	No effect pathways (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways (separate catchment)
Migneint-Arenig-Ddu allt SPA	15	N	N	
Hen harrier Circus cyaneus		0	0	No effect pathways (separate catchment)
Merlin Falco columbarius		0	0	No effect pathways (separate catchment)
Peregrine falcon Falco peregrinus		0	0	No effect pathways (separate catchment)
Afon Eden - Cors Goch Trawsfynydd SAC	17	N	N	
Active raised bogs		0	0	No effect pathways (separate catchment)
Freshwater pearl mussel Margaritifera margaritifera		0	0	No effect pathways (separate catchment)
Atlantic salmon Salmo salar		0	0	No effect pathways (separate catchment)
Otter Lutra lutra		0	0	No effect pathways (separate catchment)
Floating water-plantain Luronium natans		0	0	No effect pathways (separate catchment)
Llyn Idwal Ramsar	17	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	No effect pathways (separate catchment)
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities		0	0	No effect pathways (separate catchment)
Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC	18	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	No effect pathways (separate catchment)
Mudflats and sandflats not covered by seawater at low tide		0	0	No effect pathways (separate catchment)
Large shallow inlets and bays		0	0	No effect pathways (separate catchment)
Reefs		0	0	No effect pathways (separate catchment)
Submerged or partially submerged sea caves		0	0	No effect pathways (separate catchment)
Y Twyni o Abermenai i Aberffraw/ Abermenai to Aberffraw Dunes SAC	19	N	N	
Embryonic shifting dunes		0	0	No effect pathways (separate catchment)
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	No effect pathways (separate catchment)
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	No effect pathways (separate catchment)
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	No effect pathways (separate catchment)
Humid dune slacks		0	0	No effect pathways (separate catchment)
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	No effect pathways (separate catchment)
Petalwort Petalophyllum ralfsii		0	0	No effect pathways (separate catchment)
Shore dock Rumex rupestris		0	0	No effect pathways (separate catchment)

8109-1

Reduce compensation water releases from Llwynon Reservoir

Option Summary

The drought option involves a proposed reduction in the non-consumptive fisheries abstraction from Llwynon Reservoir to the Taf Fawr (which is in effect the compensation release) by 9.1 Ml/d, from 18.2 Ml/d to 9.1 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The period of implementation for this drought permit is assumed to be the period September to November inclusive.

General Assessment

This option would reduce flows into the Afon Taf Fawr which ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Cwm Cadlan SAC	4	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways (separate catchment)
Alkaline fens		0	0	No effect pathways (separate catchment)
Blaen Cynon SAC	7	N	N	
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways (distance, sedentary species)
Brecon Beacons/ Bannau Brycheiniog SAC	7	N	N	
European dry heaths		0	0	No effect pathways (separate catchment)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	No effect pathways (separate catchment)
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways (separate catchment)
Siliceous rocky slopes with chasmophytic vegetation		0	0	No effect pathways (separate catchment)
Coedydd Nedd a Mellte SAC	8	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways (separate catchment)
River Usk/ Afon Wysg SAC	12	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways (separate catchment)
Sea lamprey Petromyzon marinus		0	0	No effect pathways (separate catchment)
Brook lamprey Lampetra planeri		0	0	No effect pathways (separate catchment)
River lamprey Lampetra fluviatilis		0	0	No effect pathways (separate catchment)
Allis shad Alosa alosa		0	0	No effect pathways (separate catchment)
Twaite shad Alosa fallax		0	0	No effect pathways (separate catchment)
Atlantic salmon Salmo salar		0	0	No effect pathways (separate catchment)
Bullhead Cottus gobio		0	0	No effect pathways (separate catchment)
Otter Lutra lutra		0	0	No effect pathways (separate catchment)
Usk Bat Sites/ Safleoedd Ystlumod Wysg SAC	15	N	N	
European dry heaths		0	0	No effect pathways (separate catchment)
Degraded raised bogs still capable of natural regeneration		0	0	No effect pathways (separate catchment)
Blanket bogs (* if active bog)		0	0	No effect pathways (separate catchment)
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways (separate catchment)
Caves not open to the public		0	0	No effect pathways (separate catchment)
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Aberbargoed Grasslands SAC	19	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways (separate catchment)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways (distance, sedentary species)
Cwm Clydach Woodlands / Coedydd Cwm Clydach SAC	19	N	N	
Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or		0	0	No effect pathways (separate catchment)
Asperulo-Fagetum beech forests		0	0	No effect pathways (separate catchment)
Llangorse Lake/ Llyn Syfaddan SAC	19	N	N	
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	No effect pathways (separate catchment)
Severn Estuary Ramsar	42/DS	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 4 - supports plant/animal species at a critical stage in their life cycles, or provides refuge		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 5 - regularly supports 20,000 or more waterbirds		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 8 - important source of food for fishes, spawning ground, nursery and/or migration path		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Severn Estuary SPA	42/DS	N	N	
Tundra swan Cygnus columbianus bewickii		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common shelduck Tadorna tadorna		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Gadwall Anas strepera		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common redshank Tringa totanus		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Greater white-fronted goose Anser albifrons albifrons		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Dunlin Calidris alpina alpina		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterbird assemblage		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterfowl assemblage		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Severn Estuary/ Môr Hafren SAC	42/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Estuaries		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Mudflats and sandflats not covered by seawater at low tide		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Reefs		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Sea lamprey Petromyzon marinus		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
River lamprey Lampetra fluviatilis		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Twaite shad Alosa fallax		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)

8109-4

Emergency abstraction from the Afon Lwyd at New Inn

Option Summary

The drought permit involves a new, unsupported emergency river abstraction of 12Ml/d from the Afon Lwyd, at New Inn, between Pontypool and Cwmbran, which would supply either Llandegfedd Reservoir or Sluvad WTW via a temporary pipeline (approximately 2.5km). To enable abstraction a low temporary weir would be required across the Afon Lwyd. The drought permit abstraction would not be for additional water, but would transfer the sum of the existing abstraction licences to the proposed location. The timing of the drought permit is most likely to occur during the period from September to November inclusive, and will influence the Afon Lwyd downstream of the abstraction to its tidal limit at Caerleon. The weir is also likely to act as an impassable physical barrier upstream of the temporary weir. At this stage, it is not envisaged that the temporary weir will incorporate a fish pass.

The period of implementation for this drought permit is likely to be September to November.

General Assessment

The Afon Lwyd ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites via the River Usk SAC. The proposals will utilise a proportion of the flow from the Afon Lwyd. Some of the mobile species of the Usk (e.g. Atlantic salmon, Otter) are also known to use the Afon Lwyd, and could potentially be affected by the scheme although the River Usk itself is considered to be beyond the zone of hydrological influence for the scheme. In addition, construction of the artificial weir has the potential to affect the Usk, if not appropriately planned and managed (although such effects can probably be avoided with scheme-specific measures. Significant effects on the River Usk SAC are possible.

Significant effects?

Construction: Yes - effects possible but significant or significant adverse effects clearly avoidable with established scheme-level avoidance or mitigation measures

Operation: Uncertain - effect pathway present but effects likely to be minimal; appropriate assessment likely to confirm effects will not be significant.

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
River Usk/ Afon Wysg SAC	7	U	U	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		N	N	Feature absent from downstream areas; operation uses existing licenced volumes
Sea lamprey Petromyzon marinus		N	N	Feature not thought to be present in Lwyd; operation uses existing licenced volumes
Brook lamprey Lampetra planeri		N	N	Feature absent from downstream areas; operation uses existing licenced volumes
River lamprey Lampetra fluviatilis		N	N	Feature not thought to be present in Lwyd; operation uses existing licenced volumes
Allis shad Alosa alosa		N	N	Feature not thought to be present in Lwyd; operation uses existing licenced volumes
Twaite shad Alosa fallax		N	N	Feature not thought to be present in Lwyd; operation uses existing licenced volumes
Atlantic salmon Salmo salar		U	U	Construction relies on best-practice mitigation; operation uses existing licenced volumes
Bullhead Cottus gobio		N	N	Feature absent from downstream areas; operation uses existing licenced volumes
Otter Lutra lutra		U	N	Construction relies on best-practice mitigation; operation uses existing licenced volumes
Aberbargoed Grasslands SAC	14	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Usk Bat Sites/ Safleoedd Ystlumod Wysg SAC	14	N	N	
European dry heaths		0	0	No effect pathways
Degraded raised bogs still capable of natural regeneration		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Caves not open to the public		0	0	No effect pathways
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Severn Estuary Ramsar	14/DS	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 4 - supports plant/animal species at a critical stage in their life cycles, or provides refuge		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 5 - regularly supports 20,000 or more waterbirds		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 8 - important source of food for fishes, spawning ground, nursery and/or migration path		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Severn Estuary SPA	14/DS	N	N	
Tundra swan Cygnus columbianus bewickii		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common shelduck Tadorna tadorna		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Gadwall Anas strepera		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common redshank Tringa totanus		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Greater white-fronted goose Anser albifrons albifrons		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Dunlin Calidris alpina alpina		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterbird assemblage		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterfowl assemblage		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Severn Estuary/ Môr Hafren SAC	14/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Estuaries		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Mudflats and sandflats not covered by seawater at low tide		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Reefs		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Sea lamprey Petromyzon marinus		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
River lamprey Lampetra fluviatilis		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Twaite shad Alosa fallax		N	N	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Cwm Clydach Woodlands / Coedydd Cwm Clydach SAC	16	N	N	
Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or		0	0	No effect pathways
Asperulo-Fagetum beech forests		0	0	No effect pathways
Wye Valley and Forest of Dean Bat Sites/ Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena SAC	16	N	N	
Lesser horseshoe bat Rhinolophus hipposideros		0	0	No effect pathways
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	No effect pathways
Sugar Loaf Woodlands SAC	17	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways

8112-1

Emergency abstraction from the River Rhondda at Treherbert

Option Summary

The drought permit involves a new, unsupported emergency river abstraction of 1Ml/d from the Afon Rhondda Fawr adjacent to Treherbert to support raw water supply to the raw water storage reservoir at Tynywaun WTW. To enable the abstraction, a low, temporary weir constructed of sandbags, would be required across the Afon Rhondda Fawr. A modest volume of water would be available from this drought permit scheme during a drought, and there is benefit to supply locally through provision of an immediate additional water resource to an existing WTW. A temporary pipeline and mobile pumping equipment would need to be installed to lift abstracted water to Tyn y Waun WTW raw water reservoir. The period of implementation for this drought permit is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

This option would reduce flows in the Afon Rhondda Fawr which ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Blaen Cynon SAC	6	N	N	
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways (not sensitive / exposed)
Coedydd Nedd a Mellte SAC	7	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways (separate catchment)
Cwm Cadlan SAC	10	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways (separate catchment)
Alkaline fens		0	0	No effect pathways (separate catchment)
Blackmill Woodlands SAC	13	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways (separate catchment)
Glaswelltiroedd Cefn Cribwr/ Cefn Cribwr Grasslands SAC	17	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways (separate catchment)
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways (not sensitive / exposed)
Severn Estuary Ramsar	37/DS	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 4 - supports plant/animal species at a critical stage in their life cycles, or provides refuge		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 5 - regularly supports 20,000 or more waterbirds		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 8 - important source of food for fishes, spawning ground, nursery and/or migration path		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Severn Estuary SPA	37/DS	N	N	
Tundra swan Cygnus columbianus bewickii		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common shelduck Tadorna tadorna		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Gadwall Anas strepera		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common redshank Tringa totanus		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Greater white-fronted goose Anser albifrons albifrons		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Dunlin Calidris alpina alpina		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterbird assemblage		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterfowl assemblage		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Severn Estuary/ Môr Hafren SAC	37/DS	N	N	

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Estuaries		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Mudflats and sandflats not covered by seawater at low tide		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Reefs		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Sea lamprey Petromyzon marinus		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
River lamprey Lampetra fluviatilis		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Twaite shad Alosa fallax		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)

8116-3

Utilise the Dead Storage in Talybont Reservoir

Option Summary

It is assumed that a reduction of 50% in the statutory compensation flow release to the Nant Caerfanell (as permitted in the abstraction licence relating to the compensation flow control line) is already in place prior to this drought option being implemented. This drought option may be required in severe drawdown conditions when storage approaches the dead storage zone in Talybont Reservoir, and involves pumped abstraction of 30Ml/d from the dead storage zone for up to 30 days. This option would require installation of temporary pumping arrangements to utilise dead water within the reservoir. This would have minimal impact during the drought event but subsequent reservoir refill and spill will take longer as storage would start from a lower base position. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

This option would utilise dead storage in Talybont reservoir, which sits above the River Usk SAC. There is estimated to be a 3% increase (13 days) in the duration of the period for which storage is below top water level, and for which reservoir outflow is limited to compensation only as a result of the increased pumping
from Talybont Reservoir's dead storage zone. This also leads to a delay of 13 days in the first occurrence of reservoir overflows following refill. However, the effects of this on the Usk will be nominal and not signficant. Construction will be minor and localised within the reservoir and will not affect any designated sites.

Significant effects?

Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)
Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
River Usk/ Afon Wysg SAC	0/DS	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Sea lamprey Petromyzon marinus		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Brook lamprey Lampetra planeri		N	N	Construction too limited to have effects; no hydrological effects based on EAR
River lamprey Lampetra fluviatilis		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Allis shad Alosa alosa		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Twaite shad Alosa fallax		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Atlantic salmon Salmo salar		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Bullhead Cottus gobio		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Otter Lutra lutra		N	N	Construction too limited to have effects; no hydrological effects based on EAR
Usk Bat Sites/ Safleoedd Ystlumod Wysg SAC	3	N	N	
European dry heaths		0	0	No effect pathways
Degraded raised bogs still capable of natural regeneration		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Caves not open to the public		0	0	No effect pathways
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	No effect pathways
Llangorse Lake/ Llyn Syfaddan SAC	6	N	N	
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	No effect pathways
Brecon Beacons/ Bannau Brycheiniog SAC	7	N	N	
European dry heaths		0	0	No effect pathways
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	No effect pathways
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Siliceous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Drostre Bank SAC	11	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Cwm Clydach Woodlands / Coedydd Cwm Clydach SAC	13	N	N	
Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or		0	0	No effect pathways
Asperulo-Fagetum beech forests		0	0	No effect pathways
River Wye/ Afon Gwy SAC	13	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
White-clawed (or Atlantic stream) crayfish Austropotamobius pallipes		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Allis shad Alosa alosa		0	0	No effect pathways
Twaite shad Alosa fallax		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Cwm Cadlan SAC	16	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Sugar Loaf Woodlands SAC	17	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Coed y Cerrig SAC	18	N	N	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Blaen Cynon SAC	20	N	N	
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways

8119-1

Compensation Water Reduction of 50% at Pontsticill Reservoir

Option Summary

This option would require a reduction in the statutory compensation release from Pontsticill Reservoir to the Afon Taf Fechan by 9.1 Ml/d, from 19.1 Ml/d to 10 Ml/d. This will influence the downstream Afon Taf Fechan and its continuation, the River Taff. This will conserve the longevity of reservoir storage for use in direct supply during a drought and improve the probability of reservoir winter refill. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

This option would reduce flows in the Afon Taf Fechan which ultimately flows to the Severn Estuary SAC / SPA / Ramsar sites at Cardiff Bay via the Afon Taf. However, the effects of this option are unlikely to be measurable at the estuary and on this basis no significant effects will occur. In addition, as effects at the SAC boundary will be effectively nil there is no possibility of 'in combination' effects with other options or plans.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Brecon Beacons/ Bannau Brycheiniog SAC	8	N	N	
European dry heaths		0	0	No effect pathways
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	No effect pathways
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Siliceous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Cwm Cadlan SAC	9	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
River Usk/ Afon Wysg SAC	10	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Allis shad Alosa alosa		0	0	No effect pathways
Twaite shad Alosa fallax		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Usk Bat Sites/ Safleoedd Ystlumod Wysg SAC	11	N	N	
European dry heaths		0	0	No effect pathways
Degraded raised bogs still capable of natural regeneration		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Caves not open to the public		0	0	No effect pathways
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	No effect pathways
Blaen Cynon SAC	12	N	N	
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Coedydd Nedd a Mellte SAC	13	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Cwm Clydach Woodlands / Coedydd Cwm Clydach SAC	14	N	N	
Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or		0	0	No effect pathways
Asperulo-Fagetum beech forests		0	0	No effect pathways
Llangorse Lake/ Llyn Syfaddan SAC	15	N	N	
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation		0	0	No effect pathways
Aberbargoed Grasslands SAC	16	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Drostre Bank SAC	20	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Severn Estuary Ramsar	42/DS	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 4 - supports plant/animal species at a critical stage in their life cycles, or provides refuge		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 5 - regularly supports 20,000 or more waterbirds		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Crit. 8 - important source of food for fishes, spawning ground, nursery and/or migration path		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Severn Estuary SPA	42/DS	N	N	
Tundra swan Cygnus columbianus bewickii		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common shelduck Tadorna tadorna		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Gadwall Anas strepera		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Common redshank Tringa totanus		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Greater white-fronted goose Anser albifrons albifrons		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Dunlin Calidris alpina alpina		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterbird assemblage		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Waterfowl assemblage		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Severn Estuary/ Môr Hafren SAC	42/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Estuaries		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Mudflats and sandflats not covered by seawater at low tide		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Reefs		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Sea lamprey Petromyzon marinus		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
River lamprey Lampetra fluviatilis		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)
Twaite shad Alosa fallax		0	0	Feature not exposed to potentially significant effects (distance, any hydrological effects attenuated)

8201-1

Reduce Crai compensation flow by 50%

Option Summary

This option will require a reduction in the statutory compensation release from Crai Reservoir to the Afon Crai from 6.82 Ml/d to 3.4 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought, and improve the probability of reservoir winter refill. The period of implementation for this drought order is likely to be August to November, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

The Afon Crai is part of the River Usk SAC and the compensation releases from Crai Reservoir will be a substantial proportion of the flow during low flow periods as there are no significant tributaries to the Afon Crai downstream of Crai Reservoir until the confluence with the River Usk ~ 9.3 km downstream of Crai Reservoir. This option will have signficant effects on the River Usk SAC as a result of its operation. The SAC management units likely to be affected are units 9 (upper Usk tributaries including the Afon Crai) and 6 (main river Usk above Brecon). Hydrological effects are unlikely to be measurable downstream of the Afon Cilieni confluence based on the EAR; those features associated with the lower reaches of the Usk below Brecon (based on the Core Management Plan) will not therefore be exposed to the likely effects of the scheme. No other sites have features exposed to the effects of the scheme.

Significant effects?

Construction: No - no construction required

Operation: Yes - significant effects certain and adverse effects may be unavoidable.

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
River Usk/ Afon Wysg SAC	0/DS	N	Y	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	N	Feature not present within hydrological zone of influence
Sea lamprey Petromyzon marinus		0	N	Feature not present within hydrological zone of influence
Brook lamprey Lampetra planeri		0	Y	Significant operational effects on Usk anticipated
River lamprey Lampetra fluviatilis		0	Y	Significant operational effects on Usk anticipated
Allis shad Alosa alosa		0	U	Feature not present within hydrological zone of influence but present below Brecon
Twaite shad Alosa fallax		0	U	Feature not present within hydrological zone of influence but present below Brecon
Atlantic salmon Salmo salar		0	Y	Significant operational effects on Usk anticipated
Bullhead Cottus gobio		0	Y	Significant operational effects on Usk anticipated
Otter Lutra lutra		0	Y	Significant operational effects on Usk anticipated
Brecon Beacons/ Bannau Brycheiniog SAC	6	N	N	
European dry heaths		0	0	No effect pathways
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels		0	0	No effect pathways
Calcareous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Siliceous rocky slopes with chasmophytic vegetation		0	0	No effect pathways
Coedydd Nedd a Mellte SAC	8	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Mynydd Epynt SAC	13	N	N	
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways
Cwm Cadlan SAC	14	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Blaen Cynon SAC	15	N	N	
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Afon Tywi/ River Tywi SAC	17	N	N	
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Allis shad Alosa alosa		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Twaite shad Alosa fallax		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
River Wye/ Afon Gwy SAC	19	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
White-clawed (or Atlantic stream) crayfish Austropotamobius pallipes		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Allis shad Alosa alosa		0	0	No effect pathways
Twaite shad Alosa fallax		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways

8201-3

Relax the maintained requirement below the Nantgaredig intake on the River Tywi

Option Summary

This drought order involves a change in the abstraction conditions at the Nantgaredig intake to relax the requirement to maintain the downstream flow at an instantaneous daily minimum of 136Ml/d. Instead, the downstream flow requirement of 136Ml/d would be temporarily assessed as a 7-day rolling average, with the daily instantaneous minimum flow requirement temporarily reduced to 116Ml/d. This would enable Welsh Water to more efficiently target a rolling average downstream flow of 136Ml/d, whilst reducing the need to over-release at times of very low flow due to the time of travel between the reservoir and the downstream abstraction intake (24 hours or more) and the difficulties of predicting the next day's gauged flows. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

This option will have signficant effects on the Afon Tywi/ River Tywi SAC as a result of its operation. Total flow upstream of the Nantgaredig intake is equal to the natural flow plus the controlled releases from the Llyn Brianne Reservoir. Downstream of the abstraction point, the natural flow component of the total flow upstream will remain, plus the regulation release at times when no abstraction is being made. The potential hydrological impact due to the implementation of the option stretches for a distance of 5.7km from the Nantgaredig intake to the tidal limit of the Afon Tywi. The downstream limit is however not clearly defined, as there is no physical barrier to limit the extent of tidal propagation upstream in the river.

Significant effects?

Construction: No - no construction required

Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Afon Tywi/ River Tywi SAC	0/DS	N	Y	
Sea lamprey Petromyzon marinus		0	Y	Significant operational effects on Tywi anticipated
Brook lamprey Lampetra planeri		0	Y	Significant operational effects on Tywi anticipated
River lamprey Lampetra fluviatilis		0	Y	Significant operational effects on Tywi anticipated
Allis shad Alosa alosa		0	Y	Significant operational effects on Tywi anticipated
Twaite shad Alosa fallax		0	Y	Significant operational effects on Tywi anticipated
Bullhead Cottus gobio		0	Y	Significant operational effects on Tywi anticipated
Otter Lutra lutra		0	Y	Significant operational effects on Tywi anticipated
Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC	9	N	U	
Sandbanks which are slightly covered by sea water all the time		0	N	Feature not sensitive
Estuaries		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Mudflats and sandflats not covered by seawater at low tide		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Large shallow inlets and bays		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Salicornia and other annuals colonizing mud and sand		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Sea lamprey Petromyzon marinus		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
River lamprey Lampetra fluviatilis		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Allis shad Alosa alosa		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Twaite shad Alosa fallax		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Otter Lutra lutra		0	U	Significant operational effects on Tywi; may extend to estuary but effects likely to be weak
Cernydd Carmel SAC	9	N	N	
Turloughs		0	0	No effect pathways
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Active raised bogs		0	0	No effect pathways
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways
Caeau Mynydd Mawr SAC	12	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Afon Teifi/ River Teifi SAC	16	N	N	

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways
Carmarthen Bay Dunes/ Twyni Bae Caerfyrddin SAC	19	N	N	
Embryonic shifting dunes		0	0	No effect pathways
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	No effect pathways
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	No effect pathways
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	No effect pathways
Humid dune slacks		0	0	No effect pathways
Narrow-mouthed whorl snail Vertigo angustior		0	0	No effect pathways
Petalwort Petalophyllum ralfsii		0	0	No effect pathways
Fen orchid Liparis loeselii		0	0	No effect pathways
Bae Caerfyrddin/ Carmarthen Bay SPA	20	N	N	
Black (common) scoter Melanitta nigra		0	0	No effect pathways
Burry Inlet Ramsar	20	N	N	
Crit. 5 - regularly supports 20,000 or more waterbirds		0	0	No effect pathways
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		0	0	No effect pathways
Burry Inlet SPA	20	N	N	
Common shelduck Tadorna tadorna		0	0	No effect pathways
Eurasian wigeon Anas penelope		0	0	No effect pathways
Eurasian teal Anas crecca		0	0	No effect pathways
Northern pintail Anas acuta		0	0	No effect pathways
Northern shoveler Anas clypeata		0	0	No effect pathways
Eurasian oystercatcher Haematopus ostralegus		0	0	No effect pathways
Grey plover Pluvialis squatarola		0	0	No effect pathways
Red knot Calidris canutus		0	0	No effect pathways
Eurasian curlew Numenius arquata		0	0	No effect pathways
Common redshank Tringa totanus		0	0	No effect pathways
Ruddy turnstone Arenaria interpres		0	0	No effect pathways
Dunlin Calidris alpina alpina		0	0	No effect pathways
Waterbird assemblage		0	0	No effect pathways
Waterfowl assemblage		0	0	No effect pathways

8201-4

Reduce Brianne compensation flow by 50%-winter refill only

Option Summary

The drought order involves reducing the compensation release rate from Llyn Brianne by 50%, from 68Ml/d to 34Ml/d, at times when flows in the lower Tywi catchment are sufficiently high such that regulation releases to support abstractions at Nantgaredig are not required. The period of implementation for this drought order is likely to be September to November, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

The Afon Tywi flows through the Cwm Doethie – Mynydd Mallaen SAC and the Elenydd – Mallaen SPA although the interest features of these sites will not be exposed and sensitive to the outcomes of the option. This option will have significant effects on the Afon Tywi/ River Tywi SAC as a result of its operation however. The drought order will influence the River Tywi from the Llyn Brianne reservoir outflow to the tidal limit.

Significant effects?

Construction: No - no construction required

Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Cwm Doethie - Mynydd Mallaen SAC	0/DS	N	N	
European dry heaths		0	N	Feature not sensitive to scheme operation
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	N	Feature not sensitive to scheme operation
Elenydd - Mallaen SPA	0/DS	N	N	
Red kite Milvus milvus		0	N	Feature not sensitive to scheme operation
Merlin Falco columbarius		0	N	Feature not sensitive to scheme operation
River Wye/ Afon Gwy SAC	7	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathway (separate catchment)
Transition mires and quaking bogs		0	0	No effect pathway (separate catchment)
White-clawed (or Atlantic stream) crayfish Austropotamobius pallipes		0	0	No effect pathway (separate catchment)
Sea lamprey Petromyzon marinus		0	0	No effect pathway (separate catchment)
Brook lamprey Lampetra planeri		0	0	No effect pathway (separate catchment)
River lamprey Lampetra fluviatilis		0	0	No effect pathway (separate catchment)
Allis shad Alosa alosa		0	0	No effect pathway (separate catchment)
Twaite shad Alosa fallax		0	0	No effect pathway (separate catchment)
Atlantic salmon Salmo salar		0	0	No effect pathway (separate catchment)
Bullhead Cottus gobio		0	0	No effect pathway (separate catchment)
Otter Lutra lutra		0	0	No effect pathway (separate catchment)
Afon Teifi/ River Teifi SAC	11	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathway (separate catchment)
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathway (separate catchment)
Sea lamprey Petromyzon marinus		0	0	No effect pathway (separate catchment)
Brook lamprey Lampetra planeri		0	0	No effect pathway (separate catchment)
River lamprey Lampetra fluviatilis		0	0	No effect pathway (separate catchment)
Atlantic salmon Salmo salar		0	0	No effect pathway (separate catchment)
Bullhead Cottus gobio		0	0	No effect pathway (separate catchment)
Otter Lutra lutra		0	0	No effect pathway (separate catchment)
Floating water-plantain Luronium natans		0	0	No effect pathway (separate catchment)
Mynydd Epynt SAC	12	N	N	
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathway (separate catchment)
River Usk/ Afon Wysg SAC	14	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathway (separate catchment)
Sea lamprey Petromyzon marinus		0	0	No effect pathway (separate catchment)

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Brook lamprey Lampetra planeri		0	0	No effect pathway (separate catchment)
River lamprey Lampetra fluviatilis		0	0	No effect pathway (separate catchment)
Allis shad Alosa alosa		0	0	No effect pathway (separate catchment)
Twaite shad Alosa fallax		0	0	No effect pathway (separate catchment)
Atlantic salmon Salmo salar		0	0	No effect pathway (separate catchment)
Bullhead Cottus gobio		0	0	No effect pathway (separate catchment)
Otter Lutra lutra		0	0	No effect pathway (separate catchment)
Afon Tywi/ River Tywi SAC	14/DS	N	Y	
Sea lamprey Petromyzon marinus		0	Y	Significant operational effects on Tywi anticipated
Brook lamprey Lampetra planeri		0	Y	Significant operational effects on Tywi anticipated
River lamprey Lampetra fluviatilis		0	Y	Significant operational effects on Tywi anticipated
Allis shad Alosa alosa		0	Y	Significant operational effects on Tywi anticipated
Twaite shad Alosa fallax		0	Y	Significant operational effects on Tywi anticipated
Bullhead Cottus gobio		0	Y	Significant operational effects on Tywi anticipated
Otter Lutra lutra		0	Y	Significant operational effects on Tywi anticipated
Elenydd SAC	15	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathway (separate catchment)
European dry heaths		0	0	No effect pathway (separate catchment)
Calaminarian grasslands of the Violetalia calaminariae		0	0	No effect pathway (separate catchment)
Blanket bogs (* if active bog)		0	0	No effect pathway (separate catchment)
Floating water-plantain Luronium natans		0	0	No effect pathway (separate catchment)
Coetiroedd Cwm Elan/ Elan Valley Woodlands SAC	17	N	N	
European dry heaths		0	0	No effect pathway (separate catchment)
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathway (separate catchment)
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathway (separate catchment)
Cors Caron Ramsar	17	N	N	
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities		0	0	No effect pathway (separate catchment)
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		0	0	No effect pathway (separate catchment)
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		0	0	No effect pathway (separate catchment)
Cors Caron SAC	17	N	N	
Active raised bogs		0	0	No effect pathway (separate catchment)
Degraded raised bogs still capable of natural regeneration		0	0	No effect pathway (separate catchment)
Transition mires and quaking bogs		0	0	No effect pathway (separate catchment)
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathway (separate catchment)
Bog woodland		0	0	No effect pathway (separate catchment)
Otter Lutra lutra		0	0	No effect pathway (separate catchment)

8202-1

Increase the Llechryd abstraction from 19 Ml/d to 21 Ml/d and obtain variation of annual licence amounts

Option Summary

The drought order involves a proposed increase in the daily abstraction rate at the Llechryd intake, whereby the licence condition relating to the abstraction rate in any 24 hour period would be increased by 2Ml/d, from 19Ml/d to 21Ml/d. This would also require amendment of the hourly abstraction rate condition. The drought order would increase the unsupported river abstraction from the Afon Teifi. There is an all year period of implementation for this drought order, however implementation is likely to occur in the summer period, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

Llechryd WTW is located in the south-west of the Mid South Ceredigion WRZ. It is fed by an abstraction from the nearby Afon Teifi. The intake for the WTW is about 4.4km upstream of the tidal limit. Flow in the Afon Teifi is unsupported by upstream releases and the surface water abstraction results in a removal of a proportion of the downstream flow. During a drought, river flows would be low and the increase in abstraction rate would reduce proportionally the river flow downstream of the intake. However, the EAR has determined that the effects on flows in the Teifi will be negligible for all reaches considered (1% reduction in the Q95 flow value). Consequently, the features of the Afon Teifi SAC will not be significantly affected by scheme operation.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Afon Teifi/ River Teifi SAC	0/DS	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	Feature not exposed (location)
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	N	No significant hydrological effects anticipated
Sea lamprey Petromyzon marinus		0	N	No significant hydrological effects anticipated
Brook lamprey Lampetra planeri		0	N	No significant hydrological effects anticipated
River lamprey Lampetra fluviatilis		0	N	No significant hydrological effects anticipated
Atlantic salmon Salmo salar		0	N	No significant hydrological effects anticipated
Bullhead Cottus gobio		0	N	No significant hydrological effects anticipated
Otter Lutra lutra		0	N	No significant hydrological effects anticipated
Floating water-plantain Luronium natans		0	0	Feature not exposed (location)
Cardigan Bay/ Bae Ceredigion SAC	8/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not sensitive
Reefs		0	N	Feature unlikely to be exposed
Submerged or partially submerged sea caves		0	0	Feature not sensitive
Sea lamprey Petromyzon marinus		0	N	No significant hydrological effects anticipated
River lamprey Lampetra fluviatilis		0	N	No significant hydrological effects anticipated
Bottlenose dolphin Tursiops truncatus		0	0	Feature not sensitive
Grey seal Halichoerus grypus		0	0	Feature not sensitive
West Wales Marine / Gorllewin Cymru Forol SCI	8/DS	N	N	
Harbour porpoise Phocoena phocoena		0	0	Feature not sensitive
North Pembrokeshire Woodlands/ Coedydd Gogledd Sir Benfro SAC	10	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Barbastelle Barbastella barbastellus		0	0	No effect pathways
Gweunydd Blaencleddau SAC	12	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Preseli SAC	12	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways
Afonydd Cleddau/ Cleddau Rivers SAC	13	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Active raised bogs		0	0	No effect pathways
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston S	16	N	N	
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	No effect pathways
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Rhos Llawr-cwrt SAC	19	N	N	
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways

8203-2

Pumped abstraction from Nantymoch (a HEP reservoir operated by Statkraft) into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW

Option Summary

The drought permit involves a temporary pumped abstraction from Nant-y-Moch Reservoir, of up to 5Ml/d, to be transferred into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW, to support demands in the North Ceredigion WRZ. This would be a pumped abstraction from Nantymoch (a Statkraft reservoir operated to make hydro electric power), transferred into the raw water main between Llyn Llygad Rheidol Reservoir and Bontgoch WTW. The negotiated abstraction would fall within the range of the existing abstraction regime and it is likely that the diversion of this amount for public water supply would make no difference to the reservoir performance or the highly artificial flow regime of the Rheidol. This may require some localised construction works to abstract water and access the raw water main.

General Assessment

The Rheidol passes through the Coedydd a Cheunant Rheidol/ Rheidol Woods and Gorge SAC, although the features of this site are not sensitive to water resource permissions or flows within the river. The negotiated abstraction would fall within the range of Statkraft's existing abstraction regime and it is likely that the diversion of this amount for public water supply would make no difference to the reservoir performance or the highly artificial flow regime of the Rheidol. The ultimate downstream receptor is the West Wales Marine / Gorllewin Cymru Forol SCI at Aberystwyth, although operational effects will not be measurable at this distance downstream. There is a potential pathway for construction pollutants but this will not be realised (independently of any scheme-level best practice) due to the distance (hence attenuation) and barrier provided by Dinas Reservoir.

Significant effects?

Construction: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive)

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Coedydd a Cheunant Rheidol/ Rheidol Woods and Gorge SAC	6	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	Feature not exposed / sensitive to effects
Elenydd - Mallaen SPA	7	N	N	
Red kite Milvus milvus		0	0	Feature not sensitive
Merlin Falco columbarius		0	0	Feature not sensitive
Coed Cwm Einion SAC	9	N	N	
Tilio-Acerion forests of slopes, screes and ravines		0	0	No effect pathways
Cors Fochno and Dyfi Ramsar	10	N	N	
Crit. 1 - sites containing representative, rare or unique wetland types		0	0	No effect pathways
Cors Fochno SAC	10	N	N	
Active raised bogs		0	0	No effect pathways
Degraded raised bogs still capable of natural regeneration		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Dyfi Estuary / Aber Dyfi SPA	10	N	N	
Greenland white-fronted goose Anser albifrons flavirostris		0	0	No effect pathways
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC	10	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	No effect pathways
Estuaries		0	0	No effect pathways
Mudflats and sandflats not covered by seawater at low tide		0	0	No effect pathways
Coastal lagoons		0	0	No effect pathways
Large shallow inlets and bays		0	0	No effect pathways
Reefs		0	0	No effect pathways
Salicornia and other annuals colonizing mud and sand		0	0	No effect pathways
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	No effect pathways
Submerged or partially submerged sea caves		0	0	No effect pathways
Bottlenose dolphin Tursiops truncatus		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Grey seal Halichoerus grypus		0	0	No effect pathways
River Wye/ Afon Gwy SAC	11	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
White-clawed (or Atlantic stream) crayfish Austropotamobius pallipes		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Allis shad Alosa alosa		0	0	No effect pathways
Twaite shad Alosa fallax		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Elenydd SAC	12	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Calaminarian grasslands of the Violetalia calaminariae		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways
Northern Cardigan Bay / Gogledd Bae Ceredigion SPA	13/DS	N	N	
Red-throated diver Gavia stellata		0	0	Feature not exposed / sensitive to effects
West Wales Marine / Gorllewin Cymru Forol SCI	13/DS	N	N	
Harbour porpoise Phocoena phocoena		0	0	Feature not exposed / sensitive to effects
Grogwynion SAC	15	N	N	
European dry heaths		0	0	No effect pathways
Calaminarian grasslands of the Violetalia calaminariae		0	0	No effect pathways
Coedydd Llawr-y-glyn SAC	17	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Afon Teifi/ River Teifi SAC	20	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways
Cors Caron Ramsar	20	N	N	
Crit. 2 - supports vulnerable, endangered, or critically endangered species or threatened eco. communities		0	0	No effect pathways
Crit. 3 - supports populations of plant/animal species important for maintaining regional biodiversity		0	0	No effect pathways
Crit. 6 - regularly supports 1% of the individuals in a population of one species/subspecies of waterbirds		0	0	No effect pathways
Cors Caron SAC	20	N	N	
Active raised bogs		0	0	No effect pathways

Option 8203-2

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Degraded raised bogs still capable of natural regeneration		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Bog woodland		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways

8206-1

Reduce the required prescribe flow below the Crowhill Abstraction

Option Summary

The drought order involves a change in the abstraction conditions at the Crowhill intake. The prescribed flow requirement of 37.58Ml/d means that at river flows of less than 58.75Ml/d (or 110.25Ml/d from April to June and October to December), the full daily licensed volume cannot be abstracted at the Crowhill intake. The drought order would allow the river abstraction from the Western Cleddau to continue as long as flows do not fall below a lower prescribed flow of 18.79Ml/d, increasing the amount of water that can be abstracted at times of low river flows. The seasonal reduced daily abstraction limit would also be temporarily removed from October to December inclusive, so that the lower prescribed flow of 18.79Ml/d would apply throughout the period of implementation of the drought order.

The revised abstraction arrangements would legally be authorised for a maximum of 6 months. Use of the drought order powers would be removed sooner if water resources have returned to adequate levels to safeguard future water supplies, as agreed with the Welsh Ministers / Natural Resources Wales (NRW).

General Assessment

This option will have a significant operational effect on the Afonydd Cleddau/ Cleddau Rivers SAC and may affect the Pembrokeshire Marine/ Sir Benfro Forol SAC.

Significant effects?

Construction: No - no construction required

Operation: Yes - significant effects certain and adverse effects may be unavoidable.

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Afonydd Cleddau/ Cleddau Rivers SAC	0/DS	N	Y	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	Y	Significant operational effects on Cleddau anticipated
Active raised bogs		0	N	Feature not exposed (location)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	N	Feature not exposed (location)
Sea lamprey Petromyzon marinus		0	Y	Significant operational effects on Cleddau anticipated
Brook lamprey Lampetra planeri		0	Y	Significant operational effects on Cleddau anticipated
River lamprey Lampetra fluviatilis		0	Y	Significant operational effects on Cleddau anticipated
Bullhead Cottus gobio		0	Y	Significant operational effects on Cleddau anticipated
Otter Lutra lutra		0	Y	Significant operational effects on Cleddau anticipated
Pembrokeshire Marine/ Sir Benfro Forol SAC	2/DS	N	Y	
Sandbanks which are slightly covered by sea water all the time		0	N	Feature not sensitive
Estuaries		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Mudflats and sandflats not covered by seawater at low tide		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Coastal lagoons		0	N	Feature not exposed (location)
Large shallow inlets and bays		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Reefs		0	N	Feature not exposed (location)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Submerged or partially submerged sea caves		0	N	Feature not sensitive
Sea lamprey Petromyzon marinus		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
River lamprey Lampetra fluviatilis		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Allis shad Alosa alosa		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Twaite shad Alosa fallax		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Otter Lutra lutra		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Grey seal Halichoerus grypus		0	N	Feature not sensitive
Shore dock Rumex rupestris		0	N	Feature not exposed (location)
Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston S	8	N	N	
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	Feature not sensitive
Otter Lutra lutra		0	0	Feature not exposed (location)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Yerbeston Tops SAC	12	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	Feature not sensitive
Ramsey and St David`s Peninsula Coast SPA	13	N	N	
Red-billed chough Pyrrhocorax pyrrhocorax		0	0	Feature not sensitive
St David`s / Ty Ddewi SAC	13	N	N	
Vegetated sea cliffs of the Atlantic and Baltic Coasts		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	Feature not exposed (location)
Preseli SAC	15	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways
Castlemartin Coast SPA	17	N	N	
Red-billed chough Pyrrhocorax pyrrhocorax		0	0	Feature not sensitive
Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru SAC	17	N	N	
Vegetated sea cliffs of the Atlantic and Baltic Coasts		0	0	No effect pathways
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid site:		0	0	No effect pathways
Caves not open to the public		0	0	Feature not sensitive
Submerged or partially submerged sea caves		0	0	No effect pathways
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	Feature not sensitive
Petalwort Petalophyllum ralfsii		0	0	No effect pathways
Early gentian Gentianella anglica		0	0	No effect pathways
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA	17	N	N	
Manx shearwater Puffinus puffinus		0	0	Feature not sensitive
European storm-petrel Hydrobates pelagicus		0	0	Feature not sensitive
Lesser black-backed gull Larus fuscus		0	0	Feature not sensitive
Atlantic puffin Fratercula arctica		0	0	Feature not sensitive
Short-eared owl Asio flammeus		0	0	Feature not sensitive
Red-billed chough Pyrrhocorax pyrrhocorax		0	0	Feature not sensitive
Seabird assemblage		0	0	Feature not sensitive
North Pembrokeshire Woodlands/ Coedydd Gogledd Sir Benfro SAC	18	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Barbastelle Barbastella barbastellus		0	0	No effect pathways
North West Pembrokeshire Commons/ Comins Gogledd Orllewin Sir Benfro SAC	18	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways

8206-2

Reduce the Compensation release from Preseli Reservoir by 50%

Option Summary

This option would require a reduction in the statutory compensation release from the Rosebush Reservoir (also known as the Preseli Reservoir) to the Afon Syfynwy of 0.91 Ml/d from 1.82 Ml/d to 0.91 Ml/d. This will conserve the longevity of reservoir storage for use in direct supply during a drought, and improve the probability of reservoir refill during the winter. The period of implementation for this drought order is likely to be August to November, as confirmed by water resources modelling carried out by Welsh Water.

The scheme will reduce flows below the reservoir in the Afon Syfynwy before it flows into Llys-y-Fran Reservoir. Releases (including compensation releases) from Llys-y-Fran Reservoir to the downstream Afon Syfynwy would not be impacted by this option. However, the reduction in compensation releases from Preseli Reservoir will reduce inflow to Llys-y-Fran Reservoir.

General Assessment

This option would reduce proportionally the river flow into the Llys-y-Fran reservoir, and would therefore have a significant effect on the Afonydd Cleddau/ Cleddau Rivers SAC by reducing flows in the Afon Syfynwy, potentially affecting bullhead. With regard to in combination effects, it is only likely to affect the section of the SAC between the reservoirs, which is unlikely to be directly affected by any other options that could operate simultaneously.

Significant effects?

Construction: No - no construction required

Operation: Yes / Uncertain - significant effects cannot be excluded requiring additional analysis (modelling etc) of scheme operation and / or identification of acceptable operational mitigation measures

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Afonydd Cleddau/ Cleddau Rivers SAC	0/DS	N	Y	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	Y	Operation will affect SAC between the Rosebush reservoir and Llys-y-Fran
Active raised bogs		0	N	Not exposed (location)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	N	Not exposed (no effects beneath Llys-y-Fran from this option)
Sea lamprey Petromyzon marinus		0	N	Feature absent from SAC between the Rosebush reservoir and Llys-y-Fran
Brook lamprey Lampetra planeri		0	Y	Operation will affect SAC between the Rosebush reservoir and Llys-y-Fran
River lamprey Lampetra fluviatilis		0	N	Feature absent from SAC between the Rosebush reservoir and Llys-y-Fran
Bullhead Cottus gobio		0	Y	Operation will affect SAC between the Rosebush reservoir and Llys-y-Fran
Otter Lutra lutra		0	Y	Operation will affect SAC between the Rosebush reservoir and Llys-y-Fran
Preseli SAC	2	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways
North Pembrokeshire Woodlands/ Coedydd Gogledd Sir Benfro SAC	5	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Barbastelle Barbastella barbastellus		0	0	Feature not sensitive
Gweunydd Blaencleddau SAC	8	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston S	10	N	N	
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	Feature not sensitive
Otter Lutra lutra		0	0	Feature unlikely to be exposed when associated with 'home' SAC
Pembrokeshire Marine/ Sir Benfro Forol SAC	15/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Estuaries		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Mudflats and sandflats not covered by seawater at low tide		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Coastal lagoons		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Large shallow inlets and bays		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Reefs		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Submerged or partially submerged sea caves		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Sea lamprey Petromyzon marinus		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
River lamprey Lampetra fluviatilis		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Allis shad Alosa alosa		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Twaite shad Alosa fallax		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Otter Lutra lutra		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Grey seal Halichoerus grypus		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Shore dock Rumex rupestris		0	0	Not exposed (no effects beneath Llys-y-Fran from this option)
Cardigan Bay/ Bae Ceredigion SAC	17	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	No effect pathways
Reefs		0	0	No effect pathways
Submerged or partially submerged sea caves		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Bottlenose dolphin Tursiops truncatus		0	0	No effect pathways
Grey seal Halichoerus grypus		0	0	No effect pathways
Afon Teifi/ River Teifi SAC	19	N	N	
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojui		0	0	No effect pathways
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
Brook lamprey Lampetra planeri		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Atlantic salmon Salmo salar		0	0	No effect pathways
Bullhead Cottus gobio		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways
St David`s / Ty Ddewi SAC	19	N	N	
Vegetated sea cliffs of the Atlantic and Baltic Coasts		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways
Yerbeston Tops SAC	19	N	N	

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways

8206-7

Use of freshet bank for public water supply - Llysyfran - (Pembs)

Option Summary

In accordance with the Llys-y-Fran Reservoir Section 158 operating agreement, a total of 995Ml of the storage volume within Llys-y-Fran Reservoir is allocated to the freshet bank, to be released for fisheries management purposes at the direction of Natural Resources Wales (NRW). The drought order involves using 425Ml (approximately 43%) of this volume of storage for public water supply, so that only a limited number (three) of freshet releases could take place during the period of implementation. The period of implementation for this drought order is likely to be August to November.

General Assessment

The freshet is effectively 'spare' water made available for management, rather than a compensation flow or similar; as a result, the operation of the option would have no effect at all on the SAC, other than limiting the number of freshet releases that could take place whilst the option is being implemented.

Significant effects?

Construction: No - no construction required

Operation: No - no effects or clearly no LSE alone or in combination (e.g. no impact pathways; features not sensitive; within existing licence; transfer of spare water; etc.)

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Afonydd Cleddau/ Cleddau Rivers SAC	0/DS	N	N	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	N	No hydrological effects
Active raised bogs		0	N	Feature not exposed (location)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	N	No hydrological effects
Sea lamprey Petromyzon marinus		0	N	No hydrological effects
Brook lamprey Lampetra planeri		0	N	No hydrological effects
River lamprey Lampetra fluviatilis		0	N	No hydrological effects
Bullhead Cottus gobio		0	N	No hydrological effects
Otter Lutra lutra		0	N	No hydrological effects
Preseli SAC	6	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways
North Pembrokeshire Woodlands/ Coedydd Gogledd Sir Benfro SAC	9	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Barbastelle Barbastella barbastellus		0	0	No effect pathways
Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston S	10	N	N	
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	No effect pathways
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Pembrokeshire Marine/ Sir Benfro Forol SAC	10/DS	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	Feature not sensitive
Estuaries		0	0	No hydrological effects
Mudflats and sandflats not covered by seawater at low tide		0	0	No hydrological effects
Coastal lagoons		0	0	Feature not exposed (location)
Large shallow inlets and bays		0	0	No hydrological effects

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Reefs		0	0	Feature not exposed (location)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	No hydrological effects
Submerged or partially submerged sea caves		0	0	Feature not sensitive
Sea lamprey Petromyzon marinus		0	0	No hydrological effects
River lamprey Lampetra fluviatilis		0	0	No hydrological effects
Allis shad Alosa alosa		0	0	No hydrological effects
Twaite shad Alosa fallax		0	0	No hydrological effects
Otter Lutra lutra		0	0	No hydrological effects
Grey seal Halichoerus grypus		0	0	Feature not sensitive
Shore dock Rumex rupestris		0	0	Feature not exposed (location)
Gweunydd Blaencleddau SAC	12	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Yerbeston Tops SAC	14	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Ramsey and St David`s Peninsula Coast SPA	19	N	N	
Red-billed chough Pyrrhocorax pyrrhocorax		0	0	No effect pathways
St David`s / Ty Ddewi SAC	19	N	N	
Vegetated sea cliffs of the Atlantic and Baltic Coasts		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Floating water-plantain Luronium natans		0	0	No effect pathways

8206-8

Relax Canaston Handsoff flow

Option Summary

The drought order involves the relaxation of two parts of the abstraction licence: (1) a proposed 50% reduction in the hourly flow rate downstream of the Canaston intake which triggers the requirement to ensure that the hourly rate of discharge from Llys-y-Fran Reservoir equals or exceeds the hourly abstraction rate, and; (2) a relaxation of the seasonal flow-related limits on daily abstraction which normally apply during the months of October to December inclusive. The combined effect of these two relaxations would reduce the requirement for regulation releases such that releases are only triggered once the unsupported flow flows fall below 34.1 Ml/d.

Whenever the flow downstream of the authorised point of abstraction is below 34.1 Ml/d, the drought order will have no impact on the need to regulate, nor on the flows downstream of the intake. However, the drought order will reduce the threshold for regulation releases being required. The period of implementation for this drought order is likely to be August to November, as confirmed by water resources modelling carried out by Welsh Water.

General Assessment

This option will have a significant operational effect on the Afonydd Cleddau/ Cleddau Rivers SAC and may affect the Pembrokeshire Marine/ Sir Benfro Forol SAC.

Significant effects?

Construction: No - no construction required

Operation: Yes - significant effects certain and adverse effects may be unavoidable.

Sites within 20km and Interest Features	Dist.	Vulnerable? C	Vulnerable? O	Notes
Afonydd Cleddau/ Cleddau Rivers SAC	0/DS	N	Y	
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation		0	Y	Significant effects on Cleddau likely
Active raised bogs		0	N	Feature not exposed (location)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	Y	Significant effects on Cleddau likely
Sea lamprey Petromyzon marinus		0	Y	Significant effects on Cleddau likely
Brook lamprey Lampetra planeri		0	Y	Significant effects on Cleddau likely
River lamprey Lampetra fluviatilis		0	Y	Significant effects on Cleddau likely
Bullhead Cottus gobio		0	Y	Significant effects on Cleddau likely
Otter Lutra lutra		0	Y	Significant effects on Cleddau likely
Pembrokeshire Marine/ Sir Benfro Forol SAC	0/DS	N	Y	
Sandbanks which are slightly covered by sea water all the time		0	N	Feature not sensitive
Estuaries		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Mudflats and sandflats not covered by seawater at low tide		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Coastal lagoons		0	N	Feature not exposed (location)
Large shallow inlets and bays		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Reefs		0	N	Feature not exposed (location)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Submerged or partially submerged sea caves		0	N	Feature not sensitive
Sea lamprey Petromyzon marinus		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
River lamprey Lampetra fluviatilis		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Allis shad Alosa alosa		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Twaite shad Alosa fallax		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Otter Lutra lutra		0	Y	Significant operational effects on Cleddau anticipated; effects may extend into estuary
Grey seal Halichoerus grypus		0	N	Feature not sensitive
Shore dock Rumex rupestris		0	N	Feature not exposed (location)
Pembrokeshire Bat Sites and Bosherston Lakes/ Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherston S	4	N	N	
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.		0	0	No effect pathways
Lesser horseshoe bat Rhinolophus hipposideros		0	0	Feature not sensitive
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	Feature not sensitive

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Otter Lutra lutra		0	0	Weak effect pathways via other SACs
Yerbeston Tops SAC	5	N	N	
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Bae Caerfyrddin/ Carmarthen Bay SPA	12	N	N	
Black (common) scoter Melanitta nigra		0	0	No effect pathways
Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC	12	N	N	
Sandbanks which are slightly covered by sea water all the time		0	0	No effect pathways
Estuaries		0	0	No effect pathways
Mudflats and sandflats not covered by seawater at low tide		0	0	No effect pathways
Large shallow inlets and bays		0	0	No effect pathways
Salicornia and other annuals colonizing mud and sand		0	0	No effect pathways
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)		0	0	No effect pathways
Sea lamprey Petromyzon marinus		0	0	No effect pathways
River lamprey Lampetra fluviatilis		0	0	No effect pathways
Allis shad Alosa alosa		0	0	No effect pathways
Twaite shad Alosa fallax		0	0	No effect pathways
Otter Lutra lutra		0	0	No effect pathways
Preseli SAC	16	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Depressions on peat substrates of the Rhynchosporion		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
Slender green feather-moss Drepanocladus (Hamatocaulis) vernicosus		0	0	No effect pathways
Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru SAC	17	N	N	
Vegetated sea cliffs of the Atlantic and Baltic Coasts		0	0	No effect pathways
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	No effect pathways
European dry heaths		0	0	No effect pathways
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites		0	0	No effect pathways
Caves not open to the public		0	0	No effect pathways
Submerged or partially submerged sea caves		0	0	No effect pathways
Greater horseshoe bat Rhinolophus ferrumequinum		0	0	Feature not sensitive
Petalwort Petalophyllum ralfsii		0	0	No effect pathways
Early gentian Gentianella anglica		0	0	No effect pathways
Carmarthen Bay Dunes/ Twyni Bae Caerfyrddin SAC	19	N	N	
Embryonic shifting dunes		0	0	No effect pathways
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")		0	0	No effect pathways
Fixed coastal dunes with herbaceous vegetation ("grey dunes")		0	0	No effect pathways
Dunes with Salix repens ssp. argentea (Salicion arenariae)		0	0	No effect pathways
Humid dune slacks		0	0	No effect pathways
Narrow-mouthed whorl snail Vertigo angustior		0	0	No effect pathways
Petalwort Petalophyllum ralfsii		0	0	No effect pathways

Sites within 20km and Interest Features	Dist.	Vulnerable?		Notes
		C	O	
Fen orchid Liparis loeselii		0	0	No effect pathways
Gweunydd Blaencleddau SAC	19	N	N	
Northern Atlantic wet heaths with Erica tetralix		0	0	No effect pathways
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)		0	0	No effect pathways
Blanket bogs (* if active bog)		0	0	No effect pathways
Transition mires and quaking bogs		0	0	No effect pathways
Alkaline fens		0	0	No effect pathways
Southern damselfly Coenagrion mercuriale		0	0	No effect pathways
Marsh fritillary butterfly Euphydryas (Eurodryas, Hypodryas) aurinia		0	0	No effect pathways
North Pembrokeshire Woodlands/ Coedydd Gogledd Sir Benfro SAC	19	N	N	
Old sessile oak woods with Ilex and Blechnum in the British Isles		0	0	No effect pathways
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		0	0	No effect pathways
Barbastelle Barbastella barbastellus		0	0	Feature not sensitive

Appendix D
Standard Avoidance and Best-Practice Measures

Overview

The 'avoidance measures' that may be applied to the options are detailed below, and are grouped as follows:

- General Measures (established construction best-practice, etc.) which will be applied to all options;
- Option-specific Measures (established and reliable measures identified to avoid specific potential effects on European sites, such as in relation to mobile species from the sites).

These measures will be applied unless project-level HRAs or scheme-specific environmental studies demonstrate that they are not required (i.e. the anticipated effect will not occur), not appropriate, or that alternative or additional measures are necessary or more appropriate.

Note that these measures are not exhaustive or exclusive and must be reviewed at the project stage, taking into account any changes in best-practice as well as scheme-specific survey information or studies.

General Measures and Principles

Scheme Design and Planning

All options will be subject to project-level environmental assessment as they are brought forward, which will include assessments of their potential to affect European sites during their construction or operation. These assessments will consider or identify (inter alia):

- opportunities for avoiding potential effects on European sites through design (e.g. alternative pipeline routes; micro siting; etc);
- construction measures that need to be incorporated into scheme design and/or planning to avoid or mitigate potential effects - for example, ensuring that sufficient working area is available for pollution prevention measures to be installed, such as sediment traps;
- operational regimes required to ensure no adverse effects occur (e.g. compensation releases - although note that these measures can only be identified through detailed investigation schemes and agreed through the abstraction licensing process).

Pollution Prevention

The habitats of European sites are most likely to be affected indirectly, through construction-site derived pollutants, rather than through direct encroachment. There is a substantial body of general construction good-practice which is likely to be applicable to all of the proposed options and can be relied on (at this level) to prevent significant or adverse effects on a European site occurring as a result of construction site-derived pollutants. The following guidance documents detail the current industry best-practices in construction that are likely to be relevant to the proposed schemes:

- Environment Agency Pollution Prevention Guidance Notes , including:
- PPG1: General guide to the prevention of pollution (May 2001);
- PPG5: Works and maintenance in or near water (October 2007);

- PPG6: Pollution prevention guidance for working at construction and demolition sites (April 2010);
- PPG21: Pollution incident response planning (March 2009);
- PPG22: Dealing with spillages on highways (June 2002);
- Environment Agency (2001) Preventing pollution from major pipelines [online]. Available at www.environment-agency.gov.uk/static/documents/Business/pipes.pdf. [Accessed 1 March 2011];
- Venables R. et al. (2000) Environmental Handbook for Building and Civil Engineering Projects. 2nd Edition. Construction Industry Research and Information Association (CIRIA), London.

The best-practice procedures and measures detailed in these documents will be followed for all construction works derived from the Drought Plan as a minimum standard, unless scheme-specific investigations identify additional measures and/or more appropriate non-standard approaches for dealing with potential site-derived pollutants.

General measures for species

Most species-specific avoidance or mitigation measures can only be determined at the scheme level, following scheme-specific surveys, and 'best-practice' mitigation for a species will vary according to a range of factors that cannot be determined at the strategic (DP) level. In addition, some general 'best-practice' measures may not be relevant or appropriate to the interest features of the European sites concerned (for example, clearing vegetation over winter is usually advocated to avoid impacts on nesting birds; however, this is unlikely to be necessary to avoid effects on some SPA species (such as overwintering estuarine birds) and the winter removal of vegetation might actually have a negative effect on these species through disturbance). However, the following general measures will be followed to minimise the potential for impacts on species that are European site interest features unless project level environmental studies or HRA indicate that they are not required or not appropriate, or that alternative or additional measures are more appropriate/necessary:

- Scheme design will aim to minimise the environmental effects by 'designing to avoid' potential habitat features that may be used by species that are European site interest features when outside the site boundary (e.g. linear features such as hedges or stream corridors; large areas of scrub or woodland; mature trees; etc.) through scheme-specific routing studies.
- The works programme and requirements for each option will be determined at the earliest opportunity to allow investigation schemes, surveys and mitigation to be appropriately scheduled and to provide sufficient time for consultations with NE.
- Night-time working, or working around dusk/dawn, should be avoided to reduce the likelihood of negative effects on nocturnal species.
- Any lighting required (either temporary or permanent) will be designed with an ecologist to ensure that potential 'displacement' effects on nocturnal animals, particularly SAC bat species, are avoided.
- All compounds/pipe stores etc. will be sited, fenced or otherwise arranged to prevent vulnerable SAC species (notably otters) from accessing them.
- All materials will be stored away from commuting routes/foraging areas that may be used by species that are European site interest features.
- All excavations will have ramps or battered ends to prevent species becoming trapped.

- Pipe-caps must be installed overnight to prevent species entering and becoming trapped in any laid pipe-work.

Appendix E
In combination plans and programmes

Appendix E - Key 'in combination' plans and likely effects

Plan	Summary	In combination effects with Drought Plan Options?	In combination effects with Drought Plan	Conclusion
NRW / EA (various) Drought Plans	Drought Plans prepared by the EA: - outline how the EA will manage water resources during a drought and defines their role and responsibilities; - aim to reconcile the competing interests of the environment, the need for public water supply and other abstractions; - show what additional environmental monitoring the EA will carry out; - provide a framework for liaison with water companies, awareness campaigns and determination of drought permits; - range from high-level activities where they co-ordinate drought management over England and Wales to a local level where they outline specific operational activities. Those plans particularly relevant to the Welsh Water area include the Head Office Drought Plan (covering England and Wales), Drought Plans for Wales and the Midlands as well as area plans for south east, south west and north Wales and the west Midlands.	Potential 'in combination' effects between other Drought Plans and the WRMP options cannot be meaningfully identified and assessed at this level. This is because the WRMP options cannot, in theory, operate in combination with the DP options: if the WRMP options are implemented then they will become a part of the baseline against which the effects of the DP options will be assessed (with the DP options then permitted or not at the application stage).	Potential 'in combination' effects between the Drought Plans and the WRMP options cannot be meaningfully identified and assessed at this level. This is because the WRMP options cannot, in theory, operate in combination with the DP options: if the WRMP options are implemented then they will become a part of the baseline against which the effects of the DP options will be assessed (with the DP options then permitted or not at the application stage).	No likely significant effects.
Welsh Government (2015) The Welsh National Marine Plan – Initial Draft	This draft plan sets out how the Welsh Government will achieve sustainable development in the Welsh marine area through the sustainable management of marine natural resources. It covers both Welsh inshore and offshore waters and sets out the following vision, which will be achieved through the plan's objectives and policies: • By 2036, Welsh seas are clean, healthy, safe, productive and biologically diverse: • Through an ecosystem based approach, our seas are healthy and resilient and support a sustainable and thriving economy. • Through access to and enjoyment of the marine environment, health and wellbeing are improving. • Blue growth is creating more jobs and wealth; and, is helping coastal communities become more resilient, prosperous and equitable with a vibrant culture. The Welsh marine area is making a strong contribution to energy security and climate change emissions targets through the responsible deployment of low carbon technologies.	The WNMP is a high-level policy document that does not identify specific schemes (etc) that could be reviewed for possible interactions with the Drought Plan options, and so assessment is not possible at the plan-level.	The WNMP is a high-level policy document that does not identify specific schemes (etc) that could be reviewed for possible interactions with the Drought Plan options, and so assessment is not possible at the plan-level.	No significant effects
Water Company (various) Drought Plans	Drought Plans set out the steps that each water company will take through the stages of developing drought, drought, severe drought and recovery from drought to ensure their supply of water resources. Drought Plans must be produced by all water companies to fulfil their requirements under the Water Act 2003. Those Drought Plans relevant to the WRMP are: - Dee Valley Water Drought Plan; - Albion Water Draft Drought Plan; - Severn Trent Water Drought Plan; - United Utilities Drought Plan; and	These cannot be reviewed at this stage - however, based on the current understanding of these plans and the options in the Welsh Water Drought Plan there is no risk of option-level in combination effects with other drought plans as the same water bodies are not likely to be affected.	These cannot be reviewed at this stage - however, based on the current understanding of these plans and the options in the Welsh Water Drought Plan there is no risk of plan-level in combination effects with other drought plans as the same water bodies are not likely to be affected.	No likely significant effects.

Appendix E - Key 'in combination' plans and likely effects

Plan	Summary	In combination effects with Drought Plan Options?	In combination effects with Drought Plan	Conclusion
Water Company (various) Water Resources Management Plans	Water companies in England and Wales, are required to prepare, maintain and publish a WRMP under the Water Industry Act 1991, updated by the provisions in section 37A-D of the Water Act 2003 and the Water Act 2014 and the Environment (Wales) Act 2016. The plan must set out how a water company intends to maintain the balance between supply and demand for water over a minimum of a 25 year period. This is complemented by a water company drought plan, which sets out the short-term operational steps a company will take as a drought progresses. Those neighbouring Water Resource Management Plans relevant to the plan are: - Dee Valley; - Severn Trent Water - United Utilities - Bristol Water - Thames Water.	The WRMPs are currently in preparation and so any assessment is provisional; however, based on the published draft plans no WRMP options from other water companies will interact with Welsh Water Drought Plan options to signficantly affect any European sites (as different catchments and sites are exposed). With regard to the Welsh Water WRMP, the WRMP options cannot, in theory, operate in combination with the DP options: if the WRMP options are implemented then they will become a part of the baseline against which the effects of the DP options will be assessed (with the DP options then permitted or not at the application	No additional interactions with these plans would be expected at the plan-level. With regard to the Welsh Water WRMP, the WRMP options cannot, in theory, operate in combination with the DP options: if the WRMP options are implemented then they will become a part of the baseline against which the effects of the DP options will be assessed (with the DP options then permitted or not at the application stage).	No likely significant effects.
Environment Agency / Natural Resources Wales (various) Flood Risk Management Plans	Flood Risk Management Plans (FRMPs) give an overview of the flood risk across each river catchment. They recommend ways of managing those risks now and over the next 50-100 years. FRMPs consider all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea, (coastal flooding), which is covered in Shoreline Management Plans. They also take into account the likely impacts of climate change, the effects of how we use and manage the land, and how areas could be developed to meet our present day needs without compromising the ability of future generations to meet their own needs. Those FRMPs present in the Welsh Water area are: - The Dee - The Severn - Western Wales	The DP options have the potential to interact with these FRMPs although based on a review of these FRMPs it is not possible to identify specfic in combination risks (the FRMPs have broad policy positions for sections of river (e.g. 'Maintain existing defences and inspection regime') but do not idenitfy specific schemes); and in reality the DP options are of a scale whereby significant effects in combination effects would not be expected.	No additional interactions with these plans would be expected at the plan-level.	No likely significant effects.

Appendix E - Key 'in combination' plans and likely effects

Plan	Summary	In combination effects with Drought Plan Options?	In combination effects with Drought Plan	Conclusion
Environment Agency / Natural Resources Wales (various) River Basin Management Plans	River Basin Management Plans (RBMPs) set out how the water environment will be managed and provide a framework for more detailed decisions to be made. RBMPs set out a more integrated approach to river basin management based on the following principles: - Integrate and streamline plans and processes; - Set out a clear, transparent and accessible process of analysis and decision-making; - Focus at the river basin district level; - Work in partnership with other regulators; - Encourage active involvement of a broad cross-section of stakeholders; - Make use of the alternative objectives to deliver sustainable development; - Use Better Regulation principles and consider the cost-effectiveness of the full range of possible measures; - Seek to be even handed across different sectors of society and sectors of industry; - Seek to be even handed and transparent in the management of uncertainty; - Develop methodologies and refine analyses as more information becomes available. RBMPs in the Welsh Water area are Severn, Western Wales and Dee.	The preferred options only have the potential to interact with the Western Wales RBMP, specifically the Merionydd catchment (TYA004 / TYA009a) and the Cleddau and Pembrokeshire Coast catchment (PEM024a / 024b). Based on a review of RBMP it is not possible to identify specfic in combination risks (the RBMPs have broad policy positions but do not idenitfy specific schemes, and the HRA of the RBMPs concluded that project detail was not sufficient for meaningful assessment). In reality the WRMP options are of a scale whereby significant effects in combination effects would not be expected.	No additional interactions with these plans would be expected at the plan-level.	No likely significant effects.
Environment Agency / Natural Resources Wales (various) Catchment Abstraction Management Strategies	Catchment Abstraction Management Strategies (CAMS) set out how water resources will be managed in each catchment and provide information on how existing abstraction licenses are managed and the availability of water for further abstraction. Within each CAMS, river flows and groundwater levels are monitored and assessed alongside the amount of water which has been abstracted on average over the previous six years and the situation if all abstraction licences were used to full capacity. This data is used to determine the water availability for each water body. CAMS within the Welsh Water area include: - River Wye - Teifi and North Ceredigion - Carmarthen Bay - Anglesey - Conwy - Llŷn and Eryri - River Usk - Thaw and Cadoxton - The Cleddau and Pembrokeshire Coastal Rivers - The Swansea Bay - Clwyd - Dee - Meirionnydd	The CAMS do not necessarily provide a mechanism for 'in combination' effects with the Options, but are used to guide the choice of options particularly where 'new water' may be required. The DPs are developed with reference to the CAMS and the WRMP, which explicitly accounts for the CAMS when calculating future water availability (and hence areas with potential deficits). This means that 'in combination' water-resource effects with the CAMS will not occur.	No additional interactions with these plans would be expected at the plan-level.	No likely significant effects.

Appendix E - Key 'in combination' plans and likely effects

Plan	Summary	In combination effects with Drought Plan Options?	In combination effects with Drought Plan	Conclusion
Local Planning Authority (various) Land Use Plans	The Welsh Water area covers a number of Local Planning Authorities. The main objectives of the existing and emerging Land Use Plans in these areas are related to the sustainable development of the area.	Based on a review of these plans there are no allocations (etc) that are likely to interact significantly with the DP options, and in reality the options are of a scale and location whereby significant effects would not be expected.	The WRMP (and hence the DP) explicitly accounts for growth forecasts when calculating future water demand (and hence areas with potential deficits). This means that 'in combination' water-resource effects with growth promoted by other plans or projects are considered and accounted for during the WRMP development process and its deficit calculations. Potential 'in combination' effects in respect of water-resource demands due to other plans or projects are unlikely since these demands are explicitly modelled when determining deficit zones.	No likely significant effects.
Shoreline Management Plans (various)	Shore Lline Management Plans are prepared in England and Wales. They are developed by Coastal Groups with members drawn from local authorities and other stakeholders. They identify the most sustainable approach to managing the flood and coastal risks to the coastline in the short term (up to 20 years), medium term (20 to 50 years) and long term (50 to 100 years). Relevant plans include: • North West England and North Wales Shoreline Management Plan • Severn Estuary Shoreline Management Plan Review • Lavernock Point to St Ann's Head Shoreline Management Plan • West of Wales Shoreline Management Plan	Based on a review of these plans it is not possible to identify specfic in combination risks (the SMPs have broad policy positions for sections of coast (e.g. hold the line; managed re-alignment) but do not idenitfy specific schemes); and in reality the WRMP options are of a scale whereby significant effects in combination effects would not be expected as the SMPs cover shoreline areas that are some distance from the location of the options.	No additional interactions with the SMPs would be expected.	No likely significant effects.